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SPECIAL ISSUE: ARTIFICIAL INTELLIGENCE IN NURSING AND HEALTHCARE: IMPLICATIONS FOR NURSING MANAGEMENT

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EDITORIAL

WILEY

Artificial intelligence in health care: Implications for nurse managers

The systemic effect of digitalisation, technological developments, improved information processing infrastructures, and the use of data is rapidly transforming health care systems internationally. An increasing pace of development and adoption of artificial intelligence-based technologies have raised expectations, discussions, and concerns. These technologies offer great potential to support different stakeholders in the health care setting; however, all direct and indirect impacts of using these technologies are not always clear. Assessment frameworks have been introduced for generating evidence for decision-makers regarding, for example, health, economic, organisational, social, legal, and ethical implications of these technologies based on a systematic evaluation targeted at safety, efficacy, quality, appropriateness, cost-effectiveness, and efficiency aspects (World Health Assembly, 2014). Research evidence is crucial for assessing these technologies and their impact for appropriate adoption of artificial intelligence in nursing and health care.

This special issue of the Journal of Nursing Management is dedicated to artificial intelligence in nursing and health care and it explores implications for nursing management. Artificial intelligence may be defined as human-designed software (potentially also including hardware) systems, which "act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal" (AI HLEG, 2019, p. 6). Several themes emerged from examining the articles included in this special issue.

The first subset of studies mainly considered what artificial intelligence-based technologies are relevant for nursing and explored the ethical issues related to artificial intelligence and its applications. Specifically, Chew and colleagues conducted a scoping review to identify artificial intelligence-based technologies that can improve nursing care. The results of 37 studies included in this review provide a useful overview that suggests that these technologies help with the following nursing tasks: documentation, formulating nursing diagnoses and care plans, patient monitoring, and patient care prediction. Further, Su and colleagues conducted a specific bibliometric analysis to understand the impact of artificial intelligence-based technologies on nursing management. The results provide a thorough overview of the studies published on the topic. Finally, Zhu and colleagues examined ethical issues related to a subset of artificial intelligence-based technologies used in elderly care via a scoping review.

The results highlight several ethical issues when applying artificial intelligence-based technologies in health care and provide helpful guidance on the next steps needed to evaluate whether these technologies are applied ethically.

The second subset of articles focused on understanding the role of artificial intelligence in assessing and improving the quality of care. Specifically, a meta-analysis by Chen and colleagues showed that artificial intelligence-based technologies can be used for improving health care workers' compliance with hand hygiene protocols in four ways, including automated training, electronic counting devices and remote monitoring, real-time hand hygiene reminders and feedback, and automated monitoring. The results of this meta-analysis show that these technologies effectively increase compliance and encourage nurse managers' adoption. A rapid review by Lobo and colleagues describes the literature on technology-based interventions for caregivers of patients suffering from a stroke. The study results show that technology can be used to educate and support caregivers, minimising uncertainty and ensuring a better quality of care for patients after stroke. Zhou and colleagues implemented an e-handover system and assessed its effect on paediatric nursing handover quality and efficiency. Study results show that an e-handover system improved nurse handover quality, optimised workflow, and increased work efficiency. An additional study by Zeyu and colleagues showed that an artificial intelligence-based video surveillance system used in a nursing home could help nurses to spend less time on patients' daily assessments. In addition, research by von Gerich and colleagues explored the opportunities of using artificial intelligence for semi-automated evaluation of provided care through specific indicators extracted from structured and unstructured information in electronic health records. They concluded that electronic health records may function as one source of information in tools that support the assessment of the quality of care.

The third subset of articles regarded the use of artificial intelligence for risk prediction. For example, Flaks-Manov and colleagues explored the potential benefit of combining an automated 30-day readmission prediction model with clinicians' risk assessments. The authors concluded that this combination improves risk identification concerning readmission of elderly patients. Another example is a study by Ladios-Martin and colleagues, who developed a model for detecting individuals at risk of falls. The results inform the selection of variables to input in such a model, and their evaluation showed that a model including a fall prevention variable outperformed a model

without it in detecting the risk of falls. The authors suggest that such models may support clinical practice when embedded into electronic health record systems.

The fourth subset of studies focused on the experiences and beliefs of robotics in nursing. On the one hand, Ergin and colleagues surveyed nurse managers' opinions on artificial intelligence and robot nurses in Turkey, where two thirds of respondents were familiar with the concepts of artificial intelligence and robots. A similar number of respondents stated that robot nurses would benefit the nursing profession, while three-quarters voiced disbelief about robots replacing nurses. On the other hand, Teng and colleagues described how robots influenced nurses' time pressure and turnover intention and concluded that while robots in nursing may help reduce nurses' workload, robots also require nurses' resources to function properly. Finally, the use of robots was also studied in the context of nursing education, where Ropero-Padilla and colleagues explored the experiences and perceptions of last-year students on the acceptability and feasibility of using a chatbot for clinical decision-making and patient safety issues. Although the findings gave direction for improvement needs regarding the developed chatbot, they also supported the acceptability and feasibility of adopting a chatbot in clinical decision-making and patient safety education.

The final subset of articles focused on nurses' experiences of artificial intelligence-based applications. Here, a study by Li and colleagues surveyed the association of a leader's innovation expectation with a nurse's innovation behaviour, considering a mediating effect of job control and creative self-efficacy. Based on the results, the leader's expectation was positively associated with the nurse's behaviour. Creative self-efficacy and job control mediated this relationship. The authors concluded that the leader's expectations enhance the nurse's self-efficacy and job control, contributing to enthusiasm for innovation. Finally, in a qualitative study by Laukka and colleagues, the future role of artificial intelligence in specialised care was described as experienced by nurse leaders and digital service developers. The findings were categorised under transformed work, care and services, and organisations. The respondents thought that the role artificial intelligence-based technologies in nursing would be significant in the future, likely reinforcing rather than replacing professionals or traditional care. Positive consequences for patients, professionals, and leaders were expected to be seen.

Overall, the studies included in this special issue regard the relevance, effectiveness, impact, and experiences related to artificial intelligence in health care. Research findings show promising potential of the technologies studied in supporting nursing and evaluating and improving quality of care. As only one study included was a systematic review and meta-analysis, it seems a higher level of evidence of the effectiveness of these technologies in the clinical setting still seems to be scarce. It is also important to acknowledge that the adoption of artificial intelligence varies by setting and level of digital maturity (Flott et al., 2016). In the acute care setting, for example, this is seen through areas related to strategy, information technology capability, interoperability, governance and management, patient-centeredness, competence, and data analytics (Duncan et al., 2022).

In addition to the characteristics and impact of the technology itself and the competences needed to use it, artificial intelligence implications need to be extended to the environment. The environmental impact of health care is significant. The health care sector has, for example, been estimated to cause 10% of annual greenhouse gas emissions (Eckelman & Sherman, 2016). Action to reduce the environmental impact of health care is urgently needed for environmental sustainability, which may be defined as "a condition of balance, resilience, and interconnectedness that allows human society to satisfy its needs while neither exceeding the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs nor by our actions diminishing biological diversity" (Morelli, 2011, p. 5). Although autonomous artificial intelligence has the potential to reduce the environmental burden of health care (Wolf et al., 2022), strong leadership is needed to guide technological developments, building on a value-based approach with practical relevance. Awareness and measures are needed to avoid a vicious circle on health care pollution and its health impacts, which in turn increase the need for more health care services that again cause further pollution (Sapuan et al., 2022).

Safe and appropriate adoption of any technology in the health care setting requires capabilities and competence. Nurses are key actors in providing knowledge regarding the content and features of relevant technologies that need to be prioritised based on the needs of clinical practice. Successful and sustainable application of artificial intelligence in health care requires nursing leadership and management. The requirements regarding the level and depth of expertise related to artificial intelligence in nursing and health care vary depending on role, responsibility, and setting. In general, digital literacy has become a requirement for all nurses in everyday practice. Artificial intelligence-based technologies are taking an increasing role in this perspective. Structures are needed to ensure that all nurses understand the opportunities, benefits, challenges, and threats related to artificial intelligence in nursing and health care. This increases the expectations for the inclusion of topics related to informatics and artificial intelligence on all educational levels and in professional development in nursing, from bedside clinical competence to leadership and management.

CONFLICT OF INTEREST

None.

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ORIGINAL ARTICLE

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Identifying nursing sensitive indicators from electronic health records in acute cardiac care——Towards intelligent automated assessment of care quality

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Abstract

Aim: The aim of this study is to explore the potential of using electronic health records for assessment of nursing care quality through nursing-sensitive indicators in acute cardiac care.

Background: Nursing care quality is a multifaceted phenomenon, making a holistic assessment of it difficult. Quality assessment systems in acute cardiac care units could benefit from big data-based solutions that automatically extract and help interpret data from electronic health records.

Methods: This is a deductive descriptive study that followed the theory of value-added analysis. A random sample from electronic health records of 230 patients was analysed for selected indicators. The data included documentation in structured and free-text format.

Results: One thousand six hundred seventy-six expressions were extracted and divided into (1) established and (2) unestablished expressions, providing positive, neutral and negative descriptions related to care quality.

Conclusions: Electronic health records provide a potential source of information for information systems to support assessment of care quality. More research is warranted to develop, test and evaluate the effectiveness of such tools in practice.

Implications for Nursing Management: Knowledge-based health care management would benefit from the development and implementation of advanced information systems, which use continuously generated already available real-time big data for improved data access and interpretation to better support nursing management in quality assessment.

KEYWORDS
acute cardiac care, care quality assessment, electronic health records, nursing care quality, nursing-sensitive indicators

1 | BACKGROUND

Providing high-quality health services is key in managing cardiovascular diseases and improving patient outcomes (Thomas et al., 2018). Despite the efforts in achieving a downward trend of disease prevalence in high-income countries (Amini et al., 2017), cardiovascular diseases are still an important cause of mortality globally, causing over 38% of premature deaths in 2019 (WHO, 2021). Improving service quality has been estimated to prevent up to 2.5 million of these deaths annually (WHO, 2020a). Acquiring good quality is a continuous cycle of planning, implementing and evaluating quality improvement activities in all levels of a health care system (WHO, 2020b). On the clinical level, systematic quality assessment of cardiac care using illness-specific quality metrics has the potential to improve care outcomes, but to be effective, the results should be connected to patient-related outcomes, such as patient experience or mortality (Chatterjee & Joynt, 2014). The use of nursing-sensitive indicators could provide a more holistic perspective, focusing on the assessment of nursing care quality (Heslop et al., 2014). However, previous literature shows little evidence of the application of these indicators in the assessment of cardiac care.

The use of nursing-sensitive indicators can help build a foundation to quantify, measure and improve dynamic nursing care quality within all domains of nursing (Afanef et al., 2021). In fact, systematic assessment of quality based on nursing-sensitive indicators have shown to improve the quality of nursing care (Elgseer et al., 2021). For example, nurse-to-patient ratios in acute care have been proven to influence a variety of patient outcomes, such as mortality, providing valuable information when constructing optimal staffing models (Driscoll et al., 2018). In cardiac care, the use of indicators in monitoring the quality of highly specialized procedures, such as cardiac catheterization, has an impact on their quality and safety (Shen et al., 2021). However, issues regarding the selection of appropriate indicators to use, report and embed in clinical practice hinder their introduction in continuous quality assessment and improvement initiatives (Burston et al., 2013). A recent study indicated that barriers to quality improvement for nurse managers included a lack of timely data presented in a usable and easy-to-access manner (Alexander et al., 2022). Additionally, information needs vary between different actors and settings in health care, such as professionals, units and work shifts, creating a need for tailored and dynamic information systems, which respond to different users' individual needs (Peltonen et al., 2019). From a nurse's standpoint, providing requisite data entries for quality assessment generally increases documentation time and results in a need to make duplicate entries to differing documentation systems (Elgseer et al., 2021).

The potential of using electronic health records (EHRs) as a secondary data source for quality assessment has been recognized since their introduction. From early on, concerns regarding the accurate portrayal of the complexity of care and data requirements for comprehensive quality assessment as well as accuracy, comparability and timeliness of extracted data have been presented (Roth et al., 2009). These issues are as relevant today, as the use of single nursing-sensitive indicators extracted from EHRs to assess nursing care quality is on the increase. One example is the automatic detection of medication errors by comparing medication prescribing and documentation as extracted from EHRs (Kirkendal et al., 2020).

Research utilizing multiple nursing-sensitive indicators simultaneously to form a holistic picture of care quality in acute cardiac care is lacking to our knowledge. In the intensive care setting, efforts to use EHR data when manually extracting information on care quality are showing encouraging results. A study by Seaman et al. (2017) showed that combining structured and free text entries describing selected quality outcome measures provided accurate information on quality. The included measures were heavy sedation, use of physical restraints, presence and intensity of pain, unplanned extubation and pressure injuries. The used manual extraction tool in the study was considered labour-intensive, and the use of free text notes prohibited the use of automated extraction methods available to the researchers (Seaman et al., 2017).

Compared with manual extraction methods, automated methods to extract quality information from EHRs show advantages in data integrity, reliability and accuracy (Brundin-Mather et al., 2018). Introducing artificial intelligence (AI), a range of intelligent technologies present the best possible solutions in automated problem detection or prediction to improve safe patient care (Sensmeier, 2017). Methods utilizing AI have proven their applicability. Machine learning approaches, for example, hold the potential to be used in identifying inpatient fall risks from EHR's and administrative data (Lindberg et al., 2020). Natural language processing (NLP), in turn, has been applied as a novel way to process and present information gathered from free text EHR notes efficiently (Juhn & Liu, 2020; Koleck et al., 2019). All in all, the use of AI in nursing-relevant tasks is on the rise, with over 50% of said technologies using EHRs as the data source and approximately 10% of these technologies focusing on NLP (von Gerich et al., 2022).

Previous research findings indicate that quality assessment initiatives could benefit from the rich data EHRs have to offer and the use of carefully selected nursing-sensitive indicators. This study addresses the gap of knowledge in using nursing-sensitive indicators in assessing care quality in acute cardiac care units using EHRs as a data source. The results support the application of NLP methods on free text narratives, which could have a potential impact on effective and automated real time care quality assessment. The aim of this study was to examine the potential of using EHRs in assessing care quality through selected nursing-sensitive indicators in acute cardiac care. The study question was: What expressions indicating nursing care quality can be identified and extracted from structured and free-text notes in patients' EHRs?

2 | METHODS

2.1 | Research design

This retrospective descriptive study was guided by the theory of value-adding analysis described by Eakin and Gladstone (2020).

Value-adding analysis is a form of qualitative research, in which conventional qualitative analysis methods are complemented by a process of analysis aiming to construct concepts on a more abstract level. The analysis held four interrelated features: interpretation, contextualization, "creative presence of the researcher" and critical inquiry. The qualitative methods used included deductive and inductive (Elo & Kyngäs, 2008) as well as summative content analysis (Hsieh & Shannon, 2005) aiming to describe and quantify the phenomena of interest. Reporting was conducted according to the COREQ-checklist for qualitative studies (Tong et al., 2007).

2.2 | Setting

The EHR data used in this study were collected from a cardiac centre of one out of 21 hospital districts in Finland. This cardiac centre is part of highly specialized medical care offered at public hospitals. The centre operates in a university hospital, performing acute care including cardiac and lung surgeries and day surgeries, as well as outpatient follow-ups. In 2021, the centre had 20,562 outpatient visits and a total of 4963 in-hospital care episodes.

The EHR system used in the cardiac centre is a multi-professional system developed for documenting all relevant perspectives related to a patient's clinical care, including, for example, nursing and physician notes, prescriptions and treatment charts, as well as laboratory examinations and results from each service event, where the provider has interacted with a patient for care or medical treatment. Following the Finnish decree on patient records (298/2009) and the decree on patient status and rights (758/1992), all necessary and comprehensive information regarding the arrangement, planning, execution and monitoring of good patient care need to be documented in this EHR system. This information includes preliminary information regarding the patient's health status, illnesses or injuries, observations made by the caretakers, laboratory and imaging results as well as care measures to restore or maintain the patient's health or alleviate suffering. Entries made in the EHRs must be clear and understandable, containing only generally established concepts and abbreviations.

The documentation in the EHRs follows a title structure where predefined classifications are complemented using narrative free text. All health care professionals make entries to the system following codes and standards specific to their own professional groups. For nurses, the system allows to document patient care systematically by phase of nursing process. Structured data elements, such as nursing diagnosis, interventions, outcomes, intensity and discharge summary, follow the Finnish Care Classification (FinCC) system as presented by the Finnish institute for health and welfare (Kinnunen et al., 2021).

The documentation entries by different health care professionals form together an entity describing the patient's health situation and clinical pathway in a holistic and multi-professional way. Hence, when evaluating patient care, all entries made in the EHR-system are essential when seeking for an understanding of the overall picture.

2.3 | Participants

The data were collected from patients ($n = 1852$) admitted and treated at the acute cardiac care units of the cardiac centre during January 2020. The data collection point was selected to ensure the most recent data but to avert the possible skewness caused by the global outbreak of COVID-19. The data included all clinical care entries made in the centre, such as free text nursing and physician notes as well as structured clinical measurements, patient evaluations and laboratory results from all units. Only operating room reports, intensive care nursing narratives and radiology images from the cardiac centre were excluded.

The sample consisted of the EHRs of 230 patients. To ensure as wide, versatile and reliable picture as possible regarding patient care, all available entries made in the EHR were included in this study. Only including one source of the documentation, such as the nursing narratives alone, would not provide a comprehensive picture of the care provided, as the documentation in the EHR is done in a multi-professional way with all different perspectives complementing each other. The included records held 540 care episodes lasting from one to 13 days. They contained 6867 notes, including but not limited to nursing notes ($n = 2673$) and measurements ($n = 2336$), physician notes ($n = 527$), diagnostic notes ($n = 377$) and laboratory results ($n = 347$).

2.4 | Data collection

The data extraction from the EHR archives was performed by a computer scientist. The data were randomly organized by patient text files. Using a systematic random sampling method with a periodic interval, every fifth text file was selected until no relevant new discoveries were made (Grove, 2017). The point of saturation was determined by following a deductive codebook approach (Kerr et al., 2010), and saturation was reached after 180 patients. The saturation was verified by continuing the analysis with an additional 60 patients' records, and no new expressions were identified.

2.5 | Data analysis

The structure of the deductive analysis was operationalized by combining selected and well-established nursing-sensitive indicators used for assessing care quality suitable for the acute cardiac care unit environment. These patient outcome indicators included the National Database of Nursing Quality Indicators (Montalvo, 2007) and nursing-sensitive indicators applied to the context of acute care (Heslop et al., 2014) and served as a codebook to guide the deductive analysis process.

Expressions related to nursing care quality, such as words and word pairs, were extracted from the EHRs to a spreadsheet containing a codebook presented as a structured categorization matrix. The

expressions were collected and coded by one researcher, with the results analysed and discussed together with another researcher during and after the whole data analysis process. The expressions inside the codebook categories were further divided into subcategories. They were also quantified in attempts to contextualize the context as well as to further examine the use of the expressions (Hsieh & Shannon, 2005).

2.6 | Ethical considerations

This study utilized EHRs, which are classified as personal data. In Finland, the use of health record data in scientific research is regulated by Regulation (EU) 2016/679 of the European Parliament and of the Council, the Data Protection Act (1050/2018) and the Finnish decree on patient records (298/2009). The EHR data used in this study were pseudonymized, and patients or hospital units could not be identified from the results. The data were securely stored on, and accessed through, the servers of the hospital district. The data were managed following a confidentiality agreement.

This study followed The European Code of Conduct for Research Integrity -guidelines (All European Academies, 2017). The study was a part of Smart Health Care Management -project of the University of Turku. The project held an ethical approval statement (9/2020) issued by the University of Turku Ethics Committee for Human sciences (Health Care Division). It was also granted an administrative approval (J14/20) by the hospital district.

3 | RESULTS

The sample of patients consisted of 98 (43%) women and 132 (57%) men born between 1923 and 1995, ages ranging from 25 to 97 years (standard deviation 41 years). In total, 1676 expressions related to care quality were extracted of which 1235 (73.7%) originated from free text and 441 (26.3%) from structured notes.

The value-adding analysis was concretized as an interpretative inductive analysis. The expressions were divided into two categories: established expressions related to nursing care quality and unestablished expressions related to nursing care quality. Established expressions provided straightforward information directly related to nursing care quality that could be utilized as is or with minor adjustments in a tool assessing care quality. Unestablished expressions, in turn, provided information indirectly related to nursing care quality of which more research is still needed before its application in care quality assessment. Table 1 illustrates quantities of expressions related to nursing care quality extracted from free text and structured notes.

Additionally, the value adding analysis resulted in dividing all expressions extracted from the EHR's into one of the following three categories: positive descriptions, neutral descriptions and negative descriptions of patient status related to nursing care quality. These categories described the informational value of the extracted expressions, distinguishing between negative, neutral and positive care quality values. Positive descriptions were expressions indicating the absence of symptoms or adverse events as well as the occurrence or increase of general wellbeing and satisfaction. Negative descriptions,

TABLE 1 Expressions related to nursing care quality extracted from free text and structured notes

Expressions related to nursing care quality n = 1676 (100%)	Subcategory	Free text		Structured notes	
		n	(%)	n	(%)
Established expressions related to nursing care quality n = 748 (44.6%)	Experience of pain	458	(27.3)	204	(12.2)
	Adverse event	58	(3.5)	1	(0.1)
	Patient satisfaction	27	(1.6)	0	(0.0)
Unestablished expressions related to nursing care quality n = 928 (55.4%)	Physical health	124	(7.4)	235	(14.0)
	Perceived health	327	(19.5)	0	(0.0)
	Psychosocial health	185	(11.0)	1	(0.1)
	Functional health	56	(3.3)	0	(0.0)

TABLE 2 Matrix of expressions related to nursing care quality and descriptions of patient status related to nursing care quality

Expressions related to nursing care quality n = 1676 (100%)	Subcategory	Descriptions of patient status related to nursing care quality, n (%)					
		Positive		Neutral		Negative	
Established expressions related to nursing care quality n = 748 (44.6%)	Experience of pain	403	(24.0)	13	(0.8)	246	(14.7)
	Adverse event	8	(0.5)	0	(0.0)	51	(3.0)
	Patient satisfaction	15	(0.9)	3	(0.2)	9	(0.5)
Unestablished expressions related to nursing care quality n = 928 (55.4%)	Physical health	226	(13.5)	2	(0.1)	131	(7.8)
	Perceived health	240	(14.3)	36	(2.1)	51	(3.0)
	Psychosocial health	19	(1.1)	135	(8.1)	32	(1.9)
	Functional health	40	(2.4)	1	(0.1)	15	(0.9)

in turn, were expressions indicating increase or occurrence of adverse events, patient deterioration, symptoms or dissatisfaction. Neutral descriptions did not contain the aforementioned changes in patient's baseline condition or satisfaction. Table 2 presents the matrix of expressions and descriptions of patient status related to nursing care quality.

3.1 | Established expressions related to nursing care quality

Established expressions related to nursing care quality described experiences of pain, adverse events and patient satisfaction, as described in Figure 1.

The subcategory describing patients' *experience of pain* included expressions extracted from free text ($n = 458$, 37.1% of all free text entries) and structured notes ($n = 204$, 46.3% of all structured entries), being eminently the largest category identified with 662 (39.0% of all entries) different expressions. The expressions described the existence, nature and change of experienced pain. Expressions also contained information regarding the location of the pain, such as headache, chest pains, stomach ache or sore throat. The *existence* of pain was described negatively as experiencing ($n = 129$) or positively as not experiencing ($n = 219$) pain in free text notes. Neutral descriptions ($n = 11$) of existence indicated the patient having the pain under control, but also contained diagnostic entries extracted from the structured notes. The *nature* of pain included expressions describing tenderness, soreness, location or radiance of pain, but also the intensity of pain, indicated verbally and using pain rating metrics, such as the Visual Analogue Scale. A total of 197 expressions describing the nature of the experience of pain were extracted from structured notes (44.6% of structured entries), containing numerical information of pain during rest or motion. The expressions related to a *change* in pain perception described an increase or persistence of pain ($n = 18$), but also a decrease or discontinuation of pain ($n = 27$).

The subcategory regarding adverse events ($n = 59$, 4.0% of all) was mainly described in free text ($n = 58$, 4.7% of free text entries). Patient *falls and fall related injuries* described both the occurrence of the fall and details regarding the injury. All these expressions were extracted from free text notes ($n = 54$, 4.4% of free text entries). Expressions describing the occurrence ($n = 36$) were negative verbs indicating the patient falling or slipping during hospitalization. Patient fall related injuries contained information on both the obtaining ($n = 11$) but also the avoidance ($n = 7$) of bruises, dints, tears or undefined injuries. *Medication errors* were among the smallest subcategories with merely three expressions describing occurred errors in the medication process extracted from free text notes. These expressions were all negative, describing defects both in the administration and the documentation of the medication process. *Pressure injuries* were the smallest subcategory with two expressions describing tissue integrity with one expression being extracted from structured and the other from free text notes.

All expressions in the subcategory *patient satisfaction* ($n = 27$, 4.0% of all) were extracted from free text notes (2.2% of free text entries). They were expressions *as described by the nurse* or *as voiced by the patient*. They presented negative descriptions ($n = 9$) of patients being annoyed, frustrated, confused, resentful or agitated, but also neutral expressions ($n = 3$) of being pro-treatment and positive descriptions ($n = 15$) of being generally pleased.

3.2 | Unestablished expressions related to nursing care quality

Unestablished expressions related to the nursing care quality presented patients' physical, perceived, functional and psychosocial health, as described in Figure 2.

The subcategory regarding patients' *physical health* ($n = 359$, 21.0% of all) contained expressions extracted both from structured ($n = 235$, 53.3% of structured entries) and free text ($n = 124$, 10.0%
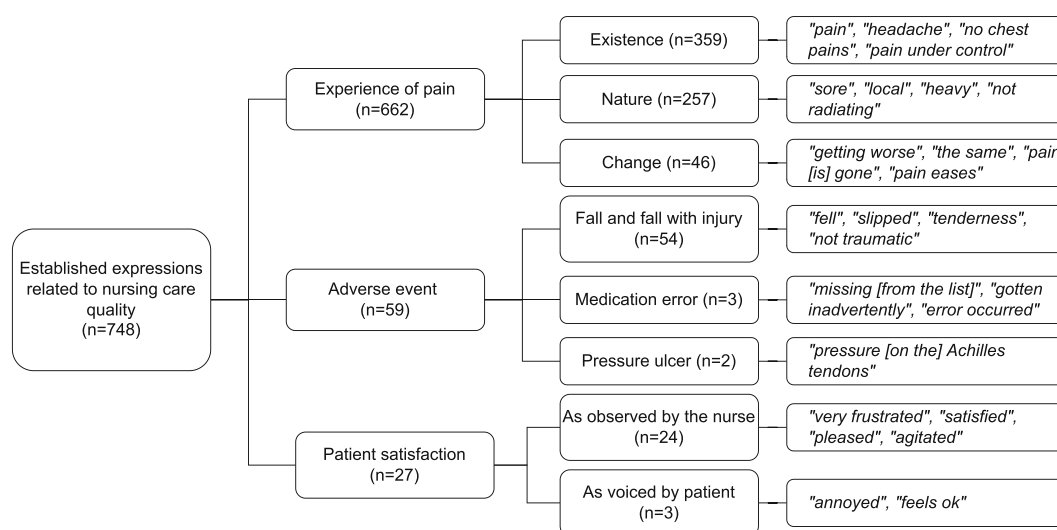
FIGURE 1 Established expressions related to nursing care quality
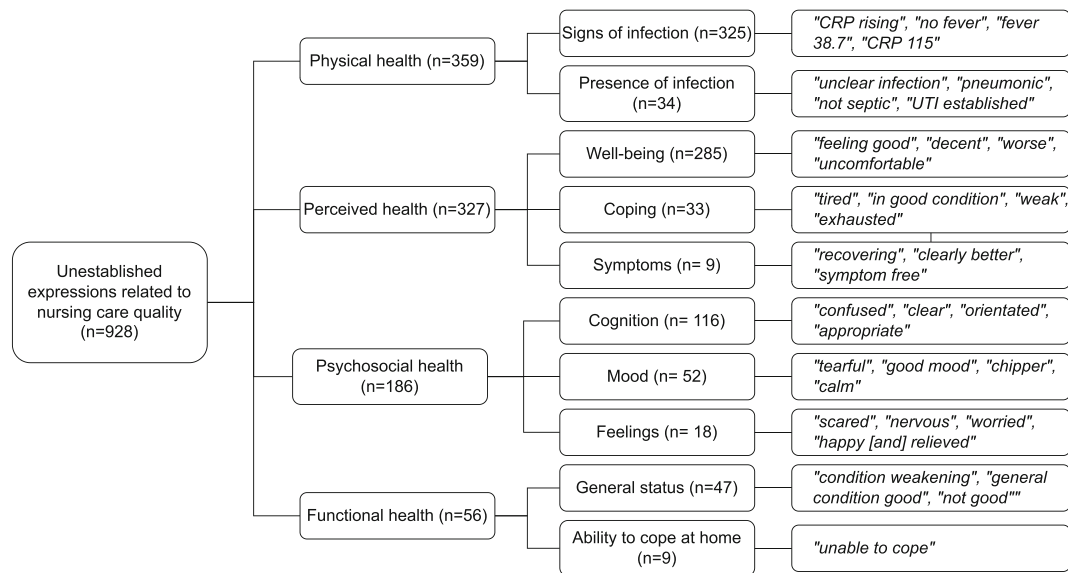
FIGURE 2 Unestablished expressions related to nursing care quality

of free text entries) notes. *Signs of infection* were predominantly extracted from structured notes ($n = 233$, 52.8% of structured entries). They contained information on a patient's body temperature, but also laboratory results on bacterial colonization of wounds, blood and urine as well as C-reactive protein (CRP), a common indicator used for detecting inflammation from blood. Expressions extracted from free text notes also described elevations and decreases of CRP, patient's body temperature and fever. The *presence of infection* contained expressions indicating the presence ($n = 21$) or absence ($n = 11$) of an undefined infection, symptoms related to an infection, wound infection, hospital acquired infection or sepsis. Neutral expressions ($n = 2$) were diagnostic entries extracted from structured notes. All expressions related to patients' physical health were connected to hospital acquired infections, but only one straight mention to an infections origin as hospital acquired was extracted, with the rest being merely context related.

Expressions in the subcategory covering expressions describing the patients' *perceived health* ($n = 327$, 20% of all) were all extracted from free text notes (26.5% of all free text entries) of which nearly 75% ($n = 240$) were positive descriptions. A patient's perceived health was related to his or her well-being, coping and symptoms. Positive descriptions ($n = 237$) of *well-being* included improvement in a patient's condition and generally feeling well. Neutral expressions ($n = 30$) described the patient feeling moderate or normal. Expressions describing the patient feeling ill or getting worse were perceived as negative ($n = 18$). Approximately 90% ($n = 30$) of the expressions describing *coping* were negative descriptions of patient feeling out of strength, exhausted, tired or weary. *Symptoms*, in turn, described mainly neutrally ($n = 5$) with the patient having no symptoms or positively ($n = 3$) as the decrease of symptoms.

The subcategory regarding the patients' *psychosocial health* ($n = 186$, 11.0% of all) included expressions of a patient's cognition,

mood and feelings extracted from free text notes (15.0% of all free text entries) except for one structured entry. *Cognition* was generally described with neutral expressions ($n = 114$) of the patient behaving appropriately or being oriented to time and place. No positive expressions describing a patient's cognition were identified. Expressions about *mood* included positive descriptions ($n = 18$) of the patient being in a good mood and feeling high-spirited to negative descriptions ($n = 14$) of the patient being tearful or seeming stressed, anxious, or feeling low. An expression extracted from structured notes presented a scored depression scale. *Feelings* were described as mainly negative ($n = 16$), with the patient expressing agitation, fear, sadness and worry.

The subcategory of expressions describing patients' *functional health* ($n = 56$, 3.0% of all) were related to a patient's general status and ability to cope at home. Expressions describing the *general status* of patients were mainly perceived as good with positive descriptions ($n = 40$). In contrast, all descriptions ($n = 9$) regarding *patients' abilities to cope at home* were negative. All expressions describing patients' functional health originated from free text notes (4.5% of all free text entries).

4 | DISCUSSION

The results present an overview of EHR-based information related to nursing care quality from three differing standpoints that need to be considered in the development and implementation of real-time information systems for care quality assessment. These include (1) a division between established and unestablished expressions, (2) a presentation of extracted information through their informational value and (3) an acknowledgement of the potential of establishing expressions of different structure in EHRs (i.e., unstructured free text and structured data).

The first standpoint indicates the degree of readiness of nursing-sensitive indicators to be used in care quality assessment. Previous research presents ample evidence of the use of nursing-sensitive indicators corresponding to the established expressions found in our study, such as experiences of pain or prevalence of pressure injuries (Seaman et al., 2017). These examples also include research focusing on extracting information related to pain management, ranging from risk identification to the evaluation of analgesic effect or pain prevalence (Nomura et al., 2021). In contrast, before their utilization in systems that help evaluate care quality, more research is needed on unestablished expressions, which are more complicated to interpret. Careful consideration is warranted on how to use these expressions in the assessment care quality. An ample example is the sub-category describing a patient's physical health containing information on signs and presence of infection. During manual data extraction, single expressions were identified describing hospital acquired infections, a widely accepted nursing quality indicator as presented by Montalvo (2007). Instead of investigating single expressions related to infections as indicating a hospital acquired infection, the timeline and the prevalence of the symptoms must be taken into consideration (Warner et al., 2013). Assessing care quality is perhaps not merely about following single indicators, but more about merging several indicators and examining trends or patterns.

These issues become even more relevant when considering the transition from manual to automated extraction methods. In a study by Ehrentraut et al. (2018), using machine learning methods, the detection of hospital-acquired infections from structured and free text EHR's showed promising results when comparing records from patients diagnosed with a hospital-acquired infection to records from undiagnosed patients. These results indicate the potential of text-classification techniques in real-world applications, reducing the manual data entry labour of health professionals (Ehrentraut et al., 2018.)

The second standpoint was the presentation of information extracted through their informational value, as illustrated by the presentation of positive, neutral and negative expressions related to nursing care quality. This approach was selected to highlight that nursing care quality is not just the prevalence of absence of negative adverse events. However, in addition to reflecting the nursing care quality, the expressions also reflect the quality of nursing documentation. In a study investigating nurse prioritization leading to unfinished care, documentation was rated among the middle-ranking tasks (Palese et al., 2020), indicating that during an intense shift some interventions or observations face the danger of being left undocumented. This can lead to issues regarding data accuracy, completeness, and consistency as well as credibility and timeliness (Feder, 2018). When using EHRs as a data source for real-time care quality assessment, these deficiencies must be understood and taken into consideration from the development phase to end user implementation and beyond. Decision making based on information derived from EHRs requires knowledge not only on the quality indicators used, but also on how the information should be interpreted. Nurse managers' competence requirements should therefore not only address quality assessment and improvement, but also comprehensive expertise on information management. In this study, efforts were made to meet the specific information needs of nurse managers in cardiac care units. However, information on care quality would benefit not only the day-to-day management, but also management on other decision-making levels in health care organizations, providing important bottom-up information to support upper management as well. From a patient's perspective, care is a continuum of contacts with varying professionals in different settings in the health care system. To form an overall picture, it would be beneficial to acquire quality information from all points of the patient's care pathway (Hanefeld et al., 2017). Expanding future research to explore the needs in other health care settings would benefit both nursing management and patient care.

The importance of promoting guidelines for high quality nursing documentation is evident. An ill-fitted documentation system may result in inconsistent descriptions regarding patient care, disabling holistic care quality assessment (Rossi et al., 2022). A focus on the information technology competence of nurses and nurse leaders as well as the development of user-driven systems is warranted. For example, an interview study investigated nurses' perceptions of the effect that EHRs have on patient safety. The results indicated a relationship between EHR usability issues resulting from poor design or user errors and the threat of quality decline. (Tubaishat, 2019.) Additionally, systems based solely on free text documentation entries have been reported to have issues regarding missing information or challenges in locating relevant information, leading to increased risk of missed nursing care (Longhini et al., 2020). It is well established that the implementation of EHRs have increased the time spent on care documentation; however, evidence suggests that after a suitable learning period, work and information flow may start to show signs of improvement (Baumann et al., 2018). This indicates that increasing nurse competence and resources may improve the benefits of both primary and secondary use of EHR data.

The third standpoint was the introduction of data structure by establishing expressions extracted from structured and free text notes. Nearly 75% of all expressions in this study were extracted from free text notes. Structured notes offered no content for example of key adverse events such as medication administration errors or patient falls, nor did they contain relevant information regarding the patients' perceived, psychosocial or functional health. Additionally, the results demonstrate a partial overlap in structured and free text documentation, indicating a burden of multiple entries that increase the professionals' workload. Expressions regarding patients' physical health, for example, presented a multitude of overlaps in expressions related to CRP levels, fever and body temperature with 257 structured entries compared with 458 free text entries, whereas pain intensity was frequently expressed both as numerical structured entries ($n = 204$) as well as free text nurse evaluations and numerical patient evaluations ($n = 458$). The study's results were in line with previous research stating that as a data source, free text notes offer invaluable information related to nursing care quality not available in structured notes (Seaman et al., 2017). Automated data extraction methods would therefore highly benefit from the introduction of NLP to support the secondary use of EHR data.

So far, NLP has been used to identify single nursing-sensitive indicators such as patient falls from EHRs (Tohira et al., 2021), indicating a possibility for a holistic care quality assessment of using multiple nursing-sensitive indicators simultaneously, providing reliable and real-time information to support nurse managers in quality evaluation and improvement initiatives. However, reliable evidence on how these tools function in practice warrants still more research (von Gerich et al., 2022), stressing the importance of not only developing and testing these tools, but also implementing and evaluating them in practice. The results of our study indicate that developing an NLP algorithm for care quality assessment could be used to identify information related to a patient's experience of pain, perceived health, psychosocial health and physical health from EHRs. More research is still needed on how to acquire comprehensive information on adverse events, patient satisfaction or functional health. One question to be resolved is whether the data gap could be narrowed merely by increasing nurse education on documentation, or if additional data sources are needed to provide this information.

The study's limitations are related to the manual data extraction method used in this study, as the expressions were extracted by only one researcher. To increase reliability, the results were regularly reviewed together with another researcher and their evaluation and interpretation discussed. Other limitations include secondary use of EHR's as a data source, as the accuracy and quality of the data are highly dependent on clinical evaluation as well as resources available for documentation.

5 | CONCLUSIONS

EHRs are a potential data source for assessing care quality, but more research is needed about interpreting and using this information in quality improvement. Issues regarding quality of nursing documentation would benefit from guidelines that promote high-quality nursing documentation and user-driven systems, but also from improving the information technology competence of the nurses and nurse management. Entries made in both structured and free text notes increase the risk of double entries, with free text providing a more holistic view on nursing care quality. Assessment care quality could benefit from the introduction of NLP in free text notes. More research is still needed to develop and test such tools in clinical practice.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

Nurse managers have an essential role in assessing care quality and quality improvement initiatives. The health system generates massive amounts of data continuously, but the tools to effectively utilize this big data for improved data access and interpretation to better support nursing management are lacking. The development, implementation and evaluation of advanced information systems based on user needs would highly benefit knowledge-based management and support

nursing management in quality assessment, by proxy benefiting patient and staff outcomes. They could also provide valuable real time information of the impact of transformational periods, such as the implementation of new technologies, educational interventions and clinical processes. Additionally, using analytical techniques to support nursing tasks is proven to have an impact on the multifaceted and difficult problem of making nursing practise visible (Macieira et al., 2018). In addition to making nursing more visible and providing information to advance the day-to-day operations management, systematic automated quality assessment methods could be beneficial to long-term management as well, presenting information on quality variations over time and revealing trends on a larger scale. This information may be used for benchmarking nursing care quality to monitor performance when compared to others, which could help attract and retain the workforce needed.

CONFLICT OF INTEREST
None.

ETHICS STATEMENT
The project held an ethical approval statement (number: 9/2020) issued by University of Turku Ethics Committee for Human sciences (Health Care Division).

DATA AVAILABILITY STATEMENT
Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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COMMENTARY

WILEY

Is there a gap between artificial intelligence applications and priorities in health care and nursing management?

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Abstract

Aim: The article aims to outline a contrast between three priorities for nursing management proposed a decade ago and key features of the following 10 years of developments on artificial intelligence for health care and nursing management. This analysis intends to contribute to update the international debate on bridging the essence of health care and nursing management priorities and the focus of artificial intelligence developers.

Background: Artificial intelligence research promises innovative approaches to supporting nurses' clinical decision-making and to conduct tasks not related to patient interaction, including administrative activities and patient records. Yet, even though there has been an increase in international research and development of artificial intelligence applications for nursing care during the past 10 years, it is unclear to what extent the priorities of nursing management have been embedded in the devised artificial intelligence solutions.

Evaluation: Starting from three priorities for nursing management identified in 2011 in a special issue of the Journal Nursing Management, we went on to identify recent evidence concerning 10 years of artificial intelligence applications developed to support health care management and nursing activities since then.

Key Issue: The article discusses to what extent priorities in health care and nursing management may have to be revised while adopting artificial intelligence applications or, alternatively, to what extent the direction of artificial intelligence developments may need to be revised to contribute to long acknowledged priorities of nursing management.

Conclusion: We have identified a conceptual gap between both sets of ideas and provide a discussion on the need to bridge that gap, while admitting that there may have been recent field developments still unreported in scientific literature.

Implications for Nursing Management: Artificial intelligence developers and health care nursing managers need to be more engaged in coordinating the future development of artificial intelligence applications with a renewed set of nursing management priorities.

1 | INTRODUCTION

Research on artificial intelligence promises innovative approaches to supporting health care management, clinical decision-making and to conduct tasks not related to patient interaction, including nursing administrative activities and patient records. Yet, even though there has been an increase in international research and development of artificial intelligence applications for nursing care during the past 10 years, are these in tune with priorities identified for nursing management? How do nursing management priorities identified in 2011 relate to artificial intelligence applications for nursing developed till 2021? Has there been some level of miscommunication between artificial intelligence applications developers and nursing managers?

In other words, to what extent priorities in nursing management may have to be revised while adopting artificial intelligence or, alternatively, to what extent the direction of artificial intelligence development may need to be revised to contribute to acknowledged priorities of nursing management? Starting from the priorities for nursing management identified in 2011 in a special issue of the Journal Nursing Management (Parker & Hyrkas, 2011), we will go on to identify the most recent evidence concerning the trends on artificial intelligence applications focussing on nursing activities (Seibert et al., 2021). The final section of the article discusses identified gaps.

Additional evidence on nursing informatics (NI; Peltonen et al., 2016; Topaz et al., 2016) has identified the point of view of nursing specialists concerning what they consider and recommend to be key research and development trends and topics, including artificial intelligence, clinical decision support systems, big data research and care coordination. This evidence, published in between 2011 and 2021, corroborates the need to clarify the central question raised: Is there a gap between artificial intelligence applications development and priorities in nursing management?

The literature adopted for this article was identified adopting the guidance of a modified 'argumentative literature review' methodology as developed by McCullough et al. (2004) for evaluating topics while examining literature selectively in order to support or refute an argument. The purpose of this approach to literature review is to develop a body of literature that establishes a contrarian viewpoint. The authors identified the focussed questions of interest and conducted a literature search and review of pertinent articles on the topic of interest, collating and assessing the arguments based themes used by the relevant articles of interest and assessing the conclusions the authors used in supporting their arguments as explored in this article's subsequent sections.

2 | NURSING MANAGEMENT PRIORITIES: AS PROPOSED IN 2011

Even though nursing management priorities have not been postulated in the format of a globally adopted protocol, for the purpose of updating the international debate, the article adopted the perspective of a leading publication in the field as guidance for one such clarification. Thus, the authors consider the perspective of the editors of the Journal of Nursing Management who, in 2011, posed the question, 'where do we want nursing to be?' In a special issue of the Journal, the international debate proposed was set on discussing the priorities for nursing management development (Parker & Hyrkas, 2011).

Three central themes were identified. The staff related management challenge of moving from satisfaction to retention, being one; developing practice and quality of care, being a second, and financial responsibility and sustainability, being a third. The three themes mirror a number of various previously published perspectives from which the authors proposed a set of key priorities, briefly clarified in the next paragraphs.

On what concerns the nursing management priority of evolving from satisfaction to retention, it stems from a general anticipation of nursing shortages and its consequences of which were by then considered potentially very negative for patients and health systems. In fact, in 2011, turnover rates of newly graduated RNs could be as high as 50–60%, which raised cost-effectiveness issues considering the heavy recruitment and orientation resources applied to tackle this nursing management challenge and a worsening shortage of the nursing workforce. This problem has been identified for a long while (Armstrong-Stassen & Cameron, 2003; Bergmann, 2006; Cohen, 1986) and has been receiving ongoing confirmation since 2011 (Dotson et al., 2013; Moreland et al., 2015; Polly et al., 2020).

Thus, some key management interventions to improve retention have been urged since, including reassessments of newly recruited nurses' workload, hours of work, adequacy of orientation to improve levels of organizational commitment, group cohesion and social support in hospital settings and time in contact with managers were also Identified as key nursing management interventions aimed at enhancing nurses retention (Parker & Hyrkas, 2011). The relevance of these recommendations has been demonstrated by several other authors since then (Antunes, 2022; Magbity et al., 2020; Norbye & Skaalvik, 2013).

On what concerns the nursing management priority of developing practice and quality of care, these have included best practices and evidence-based practice (EBP) frameworks, infrastructure to support nursing research, staff familiarity to the available resources and protected time to provide guidance and direction for research efforts and knowledge transfer activities. These central factors identified in 2011

as fundamental required management improvements. Additionally, clinical supervision associated with lowering stress, improving practice development and the ethical issue of confidentiality in the context of whistle blowing, was also put forward in the context of this nursing management priority. Additionally, in 2011, it was also anticipated that inter-cultural sensitivity and competencies would become relevant due to globalization and related increasing mobility of nurses and patients introducing different types of challenges to the nurse managers, directors and educators, and requiring everyone to re-assess traditional roles, values, beliefs and practices. Other authors have, in the meantime, identified similar challenges (Antunes, 2022; Magbity et al., 2020; Sungur et al., 2019).

On what refers to the nursing management priority of financial responsibility and sustainability, the main challenges identified include budgetary and management control. Also relevant to clarify this priority was the perception that budgetary control activities and role varied across health care managers depending on their professional background/education and gender. This generated the assumption that there should be specific educational requirements on economics for a manager in a position that holds major financial responsibilities. Hence, the concept of Accountable Carei was added. This being defined as the process of assuming shared responsibility for the quality and cost of care provided to with a focus on health care value, that is to say care that is effective, involves patients in decision making and reduces delivery of care not needed. Other authors have, in the meantime, contributed to update these challenges (Antunes, 2022; Norbye & Skaalvik, 2013; O'Donnell et al., 2012; Townsend et al., 2012).

In this manner, we put forward a fundamental question to be tackled in our next section. In spite of all the evidence available, have artificial intelligence applications considered these nursing management challenges in their applied developments?

3 | ARTIFICIAL INTELLIGENCE PRIORITIES FOR NURSING MANAGEMENT: THE STATUS IN 2021

In this section, we explore available recent evidence to understand and discuss how artificial intelligence applications have been evolving overall and to what extent we can corroborate that these have been developed within the nursing management priorities identified in the previous section.

Do artificial intelligence applications have room for improvement on their understanding of nursing management priorities?

Although consensus on the potential of health technologies powered by artificial intelligence to enhance nursing practice has been reported (Buchanan et al., 2020), a more recent study (Seibert et al., 2021) has shed light upon the circumstantial shortcoming s in application scenarios for artificial intelligence in nursing care settings. These are identified in the literature during the period of 10 years starting from 2011.

The definition of artificial intelligence adopted in this article is that it consists of algorithms that enable learning from data sets to achieve intelligent, goal-oriented action. In other words, algorithms that should be developed to serve the nursing management priorities.

Artificial intelligence developers are understood as the organizations (of both commercial or non-commercial nature) and related teams of programmers developing artificial intelligence solutions made available to health systems around the world.

First, it comes as a fact that in the published literature, hospitals were the most prominent setting of artificial intelligence applications in the previous 10 years of development, followed by independent living at home. In contrast, fewer applications were identified for nursing homes, home care and ambulatory long-term care.

In fact, the context of direct nursing care artificial intelligence is reported in the literature to organize care processes and support care-dependent people or family caregivers through tracking, monitoring or classifying activities. Health-related data are additionally supported by applications for care coordination including nurse rostering and scheduling. Detecting, classifying and preventing falls, as well as recognizing, classifying and reducing alarms, and predicting and classifying pressure ulcers were further purposes of introducing artificial intelligence to nursing care (Seibert et al., 2021).

However, to the probable surprise of nursing and health care managers today, few studies have reported an emphasis of artificial intelligence applications on clinical or organizational outcomes. This apparent predicament is further aggravated by the fact that artificial intelligence applications are short in data gathered outside laboratory conditions. Also, the universally accepted classification of artificial intelligence subfields relevant to health, which could act as a point in favour of enhancing artificial intelligence in nursing practice, was reported to be missing. These findings had already been exposed in other previous recent studies (Buchanan et al., 2020; Kikuchi, 2020; Wahl et al., 2018).

Hence, since 2011, Machine Learning (ML) algorithms were by far the dominant development approach in detriment of expert or hybrid systems with rule-based expert systems only adding to 11.6% of the studies published since 2011 (Seibert et al., 2021).

It is also evident that artificial intelligence application developments for nursing have been focusing on image and signal processing with tracking, monitoring of patients and consumables, especially in the hospital context, and much less relevant to other settings of care (i.e., primary care and home care), even though this approach contributes to organize and prioritize activities that can be applied to boost the efficiency of nursing care procedures. In contrast, studies have focused less often on the processing of human language (Natural Language Processing or NLP) as also recently further explored (Jacennik et al., 2022).

In addition to technical or computational requirements, further requirements concerning the specific context of nursing care are scarce and mainly tackle overarching topics, such as data privacy, safety and acceptance. The same holds for Ethical, Legal and Societal Issues (ELSIs), which, for instance, have not been reflected or

discussed in the majority of studies using real-world scenarios (Seibert et al., 2021).

Further to these predicaments, as demonstrated by the central systematic review under scrutiny, the health, wellbeing and satisfaction of the caregiver were addressed in a very small number of cases. Published research in real-world settings has also not given any prominent role to the support of care-dependent people and patient education and no research conducted in a real-world setting focused on the health of caregivers or nurses. Additionally to these findings, only a few publications went beyond proof-of-concept studies or laboratory experiments and applied artificial intelligence in real-world scenarios, and even fewer studies have assessed the effects of artificial intelligence on clinical and organizational outcomes (Seibert et al., 2021). The particularly important issue is further corroborated by other studies that suggest that there are certain gaps in artificial intelligence applications used in outcomes research across therapeutic areas and further considerations will be needed before artificial intelligence usage can be incorporated into health technology assessment decision-making processes (Bélisle-Pipon et al., 2021).

Hence, other recent systematic and scoping reviews on the application of artificial intelligence in nursing research (as well as in practice and emerging trends), covering original research published, suggest that the focus has been on ML methods, such as deep learning, or on health technologies that incorporate artificial intelligence approaches themselves, such as robots or clinical decision support systems. Various application scenarios have been identified, including clinical or organizational outcomes (especially patient falls), admission decisions in emergency medicine, high-definition image recognition and socially assistive robots or health care assistant chatbots. There has been an increase in research and research needs discussion highlighting possibilities for the future development of artificial intelligence in nursing care. However, the importance of collaborative, interdisciplinary research has been generally underscored (Ampavathi & Vijaya Saradhi, 2022; Apell & Eriksson, 2021; Jacennik, 2022).

4 | WHAT ARE THE GAPS?

In the previous sections, we have presented simplified sets of principles influencing two key areas of health systems development. On the one hand, we clarified the key nursing management priorities to tackle key health care management challenges as assumed in 2011 in an internationally relevant scientific publication.

On the other hand, we have presented an overview of the focus of artificial intelligence developers when it comes to emanating solutions for nursing management. There seems to be a gap when we set their prime concerns side by side.

In fact, as presented in Table 1, nursing management priorities proposed in 2011 focussed on three key ideas. One, focussing on human resources management, would be evolving from staff satisfaction to retention through revising nurses' workload, balancing hours of work and adequacy of orientation from leaders, while enhancing

TABLE 1 Contrasting nursing management priorities and artificial intelligence applications prime concerns

Three nursing management priorities in 2011 and some key related activities	Artificial intelligence applications as developed between 2011 and 2021
• **From staff satisfaction to retention**: nurses' workload, hours of work and adequacy of orientation, group cohesion and social support • **Developing practice and quality of nursing care**: Evidence-based-practice, nursing research, resources, knowledge transfer, clinical supervision and whistle blowing, intercultural competencies; • **Financial responsibility and sustainability**: Budgetary and management control, specific educational support on economics; accountable care; health care value; accountable care:	• Main health system focus: Hospitals and independent living at home • Organizational managerial contributions: Patient tracking and monitoring, classification of activity, care coordination and communication • Technological focus: Image and signal processing, machine learning systems • Patient care contributions: Patient fall detection, and predicting and classifying pressure ulcers

group cohesion and social support. Another second priority was that of developing the practice and quality of nursing care, through the support and access to sources of evidence-based-practice (EBP), support advanced nursing research. Also, adapt research resources for those purposes via more efficient knowledge transfer to improve clinical supervision and whistle blowing, adding to these the improvement of intercultural competencies to work with international patients and international staff. Additionally, a third priority was the expectation of the advancement of competencies on financial responsibility practiced by nurses towards sustainability, by improving nurses' capacities on budgetary and management control while developing specific educational support on economics; accountable care; health care value and accountable care.

To what extent can we argue that artificial intelligence applications have taken in consideration any of the nursing management priorities proposed in 2011?

An answer to this question can be suggested from evidence published in 2021. As presented in Table 1, we can now have an overview of the main areas of development devised by artificial intelligence developers.

On what concerns key contributions with a health system perspective, the focus has been on hospitals and independent living at home. On what concerns managerial contributions of artificial intelligence applications to health care organizations, evidence suggests a focus on patient tracking and monitoring, classification of activity and broad care coordination. The additional theme of technological developments brought about contributions on image and signal processing and ML systems. When we consider contributions of artificial

intelligence to patient care, evidence suggests a focus on patient fall detection as well as predicting and classifying pressure ulcers (on a rare emphasis on specific nursing care issues).

From this summary of evidence, put in contrast between 2011 and in 2021, we can therefore argue that we have identified a gap between the proposed priorities for the improvement of nursing management and the actual developments of artificial intelligence applications positioned as solutions for health care.

In fact, following the evidence explored in the previous sections, we can raise some questions for the international debate. Where are the artificial intelligence applications to support the evolution from staff satisfaction to staff retention? Namely, artificial intelligence solutions that contribute to revising nurses' workload, balance hours of work aimed at enhancing group cohesion and social support.

Also, evidence from 2021 is not clear on how has artificial intelligence contributed to developing the practice and quality of nursing care, through the support and access to sources of evidence-based-practice or more efficient knowledge transfer to improve clinical supervision or even the improvement of intercultural competencies.

Additionally, the same evidence is not clear on how have artificial intelligence applications contributed to the advancement of competencies on financial budgetary and management control while developing specific educational support on economics; accountable care; health care value and accountable care.

We do not deny the value and interest of artificial intelligence applications for nursing care. And yet we have identified a set of gaps that needs to be discussed internationally.

Further to the gaps for practice identified, a further critical gap identified has also been clarified and it concerns research on the limitations of the clinical storage systems, noise removal methods and multi-disease prediction models (Ampavathi & Vijaya Saradhi, 2022). As these are related to innovation system performance, gaps are primarily restricted by the system weaknesses of limited resources and insufficient communication from leading health care professionals regarding their needs for improving health care using artificial intelligence technology innovations. In other words, evidence suggests that to improve innovation system performance, policy interventions intended to increase available resources and to formulate common vision and mission statements to improve health care with artificial intelligence technology innovations must be encouraged. This supports our view of an existing gap between nursing management priorities and artificial intelligence developers' perspectives (Apell & Eriksson, 2021). Other recent evidence on NI research has also identified the need to focus in key research topics including clinical decision support systems, big data research for nursing management and patient care coordination. The findings show that top research trends have changed when compared to findings in 2015 and that NI research is evolving rapidly. This puts pressure on NI education at all levels, namely to continue and advance these topics in nursing education curriculums and clinical practice and ensuring nurses are knowledgeable about the technologies and their use (Peltonen et al., 2016; Topaz et al., 2016).

5 | IMPLICATIONS FOR NURSING MANAGEMENT

The previous sections of this article sustain the clear conclusion that there must be a more deliberate coordination between current nursing management priorities and the development and deployment of artificial intelligence to address the defined priorities, as already proposed in 2011. To address this issue in a clear and actionable manner, we summarize in this section a set of actionable items for nursing managers.

Overall, there seems to be have been an apparent distance between the definition of nursing management priorities and the development of artificial intelligence applications between 2011 and 2021. It is necessary, therefore, to focus the international debate on bridging gaps between nursing management priorities and artificial intelligence developers' priorities. Nursing leaders must make additional efforts to integrate and lead artificial intelligence development groups at health system level as well as at top organizational levels. On what concerns the essential contents of artificial intelligence, one key implication of our analysis is that a better understanding of quality issues related to the specific activities of nursing care is required to be adopted by artificial intelligence developers.

Another concern is the need to add a contribution of artificial intelligence to nursing staff management. Moving from satisfaction to retention in staff management is a priority of nursing management since 2011.

An additional actionable item for nursing managers is to integrate into artificial intelligence solutions functions for managing the quality of care. Also, functions to support financial responsibility and sustainability, being also to be expected.

A gap has been identified on what concerns the few applications developed for nursing homes, home care and ambulatory long-term care, as well as few relevant artificial intelligence solutions for other settings of care beyond hospitals, namely: primary care and home care as these contribute to organize and prioritize activities to boost the efficiency of nursing care procedures.

One other implication for nursing management and an actionable item for nursing managers is the development of artificial intelligence solutions to support care-dependent people and patient education programs.

There are three key additional challenges for nursing management generated by our analysis, namely, pertaining to actionable items for management. One is the need to improve nursing leadership competencies in the innovation process of developing artificial intelligence solutions focussing on the real needs of nursing care. A second actionable action for management is the need to improve the contribution of artificial intelligence to health care quality monitoring in and beyond hospitals in an integrated care perspective as widely advocated by Health Technology Assessment guidelines. A third implications is that it has in a whole decade of developing solutions of artificial intelligence applied to nursing management, the key perspectives of health care quality management have not been fully integrated into the solutions identified, and this should be a priority for

nurse managers in the process of influencing the development of artificial intelligence solutions. Hence, the challenge of adding artificial intelligence into nursing education curricula and research agenda remains as a crucial development (Moreira, 2022; Peltonen et al., 2016).

Yet, a word of caution the above implications. There may be recent field developments that are not yet available through published scientific literature.

6 | CONCLUSIONS

Artificial Intelligence remains an exciting development in health care management. As an innovative contribution for health systems development, the process will need ongoing improvements in its implementation and change management practice. There should be more deliberate coordination between nursing management priorities and the development and deployment of artificial intelligence to address those priorities. We have addressed this question in a clear and actionable manner. However, how can these gaps be addressed realistically? This is a key challenge for the coming years. Establishing operational commissions for nursing management and artificial intelligence at international or national levels would be a fundamental expectation resulting from the awareness of the gaps identified. These commissions should integrate senior nursing managers leading the process of influencing the setting of functions offered by artificial intelligence solutions, rather than the process of simply adopting already existing artificial intelligence functions to health care.

Interestingly, the recent report on 'The Future of Nursing 2020-2030' (National Academies of Sciences, Engineering, and Medicine, 2021), although focussing on the specific USA context, does not put an emphasis on the role of nurses on health systems innovations associated to health care research trends (Lloyd Williams, 2022) or to artificial intelligence. It rather proposes the investment in the goals of achieving health equity, removing barriers to expand the scope of practice, establish better measurements of the value of services provided by RNs, developing nurses' ability to address social determinants of health and the needs of the community, including in response to public health emergencies and disasters. It also recommends that research projects are used to demonstrate the racial and ethnic diversity within the newer classes of nurses this being presented as an important step towards achieving health equity. Additional recommendations of this report include a managerial focus on tackling poverty and other health inequities through simulation-based education, and new guidelines for evidence-based quality indicators for nursing education programs to support a broader understanding of quality nursing education. A summarized interpretation of this report could be that it brings forth new nursing management priorities set in 2021, which are likely to influence health systems and policy-making around the world.

In this manner, we can propose a closing discussion point. Admitting that during the past decade, artificial intelligence solutions seem to have ignored key nursing management priorities as proposed in 2011 (Parker & Hyrkas, 2011), to what extent the new priorities proposed in the May 2021 report (National Academies of Sciences, Engineering, and Medicine., 2021) and argeued by other authors (Graili, et al., 2021; McGrow, 2019), will again be ignored by upcoming artificial intelligence developments?

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ETHICS STATEMENT

Our study did not require an ethical board approval because the article is a commentary and does not use any patient data.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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ORIGINAL ARTICLE

WILEY

Adoption of novel biomarker test parameters with machine learning-based algorithms for the early detection of sepsis in hospital practice

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Abstract

Aims: We aim (i) to redesign sepsis's clinical pathway and fit the organizational requirements of a novel machine-learning algorithm incorporating a novel biomarker test and (ii) to assess adoption drivers of the new combined technology.

Background: There is an urgent need to achieve sepsis' early detection and diagnostic excellence.

Methods: A qualitative study based on semi-structured interviews conducted at the target site and across other Italian hospitals. A content analysis was undertaken, emergent themes were selected and categorized, and interviews were conducted until saturation was reached.

Results: Sixteen nurses (10 at the target site and six across other hospitals) and nine non-nursing professionals (seven at the target site and two across other hospitals) were interviewed. An organizational redesign was identified as the primary adoption driver. Even though nurses perceived workload increase related to the machine-learning component, technology acceptability was relatively high, as the standardization of tasks was perceived as crucial to improving professional satisfaction.

Conclusions: A novel business-oriented solution based on machine learning requires interprofessional integration, new professional roles, infrastructure improvement, and data integration to be effectively implemented.

Implications for Nursing Management: Lessons learned from this study suggest the need to involve nurses in the early stages of the design of new machine-learning technologies and the importance of training nurses on sepsis management through the support of disruptive technological innovation.

[Correction added on 15 December 2022, after first online publication: The third author's surname has been corrected from 'Benedectis' to 'Benedictis' in this version.]

1 | BACKGROUND

Sepsis is a complex time-dependent, life-threatening illness caused by a dysregulated immune host response to infection (Singer et al., 2016). Delays in the identification and treatment of sepsis during its early stages can contribute significantly to adverse outcomes until death, making it vital to achieving an early diagnosis (Angus & Bindman, 2022). Worldwide there are an estimated 49 million cases of sepsis each year, and a mortality rate ranging from 20% to 40%, as sepsis remains the most frequent cause of in-hospital death and emergency readmission in the United States (Rudd et al., 2020).

Several efforts have been made to improve the diagnosis of sepsis, all based on the hypothesis that identifying sepsis at an earlier stage will improve outcomes by reducing the time-to-antibiotics and total costs of care (Agnello et al., 2020; Piva et al., 2021). These attempts exclusively focused on hospital settings and mainly fell into four categories: (i) guidelines to standardize the clinical pathway; (ii) diagnostic criteria to automatize sepsis surveillance; (iii) artificial intelligence-based tools, such as machine-learning; and (iv) new biomarker essays (Angus & Bindman, 2022).

Tuscany, a region located in central Italy with about 3.8 million inhabitants, is characterized by an advanced regional health care system at the frontline of innovation to fight sepsis. Since 2016, Tuscany has integrated two approaches in hospital practice: (i) the new agreed 'golden hour' model aiming to harmonize the diagnostic workup and early treatment strategies (Calci et al., 2018) and (ii) the use of diagnostic scores and indicators based on non-specific sepsis' parameters (Rhodes et al., 2017). Despite these valuable efforts, sepsis' early diagnosis to be achieved before the patient meets established signs or symptoms remains complex and uncertain. More than 15,000 cases of sepsis are expected each year in Tuscany, with a 33% increase in hospitalizations in more recent years (Toscana, 2019). However, data derived from administrative databases are underestimated as the actual incidence increases and may be accelerated by the COVID-19 virus, which can lead to sepsis and increase the risk for other infections causing sepsis (Zhou et al., 2020).

This study relies on the know-how gained by the Tuscany Region in managing and treating sepsis and documents the current evolution of sepsis' early detection approaches through a clinical observational study carried out at San Donato Hospital—the most significant health unit of Arezzo located in Tuscany, Italy—since June 2019 to validate a novel combined technology.

'Monocyte Distribution Width' is a new biomarker developed by Beckman Coulter and recently validated in hospital practice of the Emergency Department for the early diagnosis of sepsis, showing an optimal sensitivity and specificity ranging from 0.645 to 0.920 and from 0.604 to 0.929 (Agnello et al., 2020). Through whole blood withdrawal, the new biomarker test allows measurements of the standard deviation of the mean monocytes volume based on morphological changes in circulating monocytes. The predictive proficiency of the biomarker can be used by a prototype version of a new machine-learning-based sepsis detection algorithm (Islam et al., 2019), able to alert nurses and doctors when a suspect of sepsis occurs and builds a patient's risk score simply by entering in a PC some medical measurements (e.g., vital parameters and clinical observations).

Exploring multifactorial determinants of technology acceptance by nurses and other professionals is strategic for management to support adoption within a health organization through tailored strategies leading to organizational flexibility (Manetti et al., 2017, 2020). A qualitative research design was employed to generate rich information allowing for an in-depth understanding of nurses' and other professionals' determinants, motivations, and emotional perceptions concerning technology adoption and organizational change. Indeed, qualitative techniques are appropriate in the early stages of research when the need for collecting more information (e.g., participants' observation) is particularly relevant. The aim of this qualitative study was twofold: (i) redesign the sepsis clinical pathway at San Donato Hospital to fit the organizational requirements of the new integrated approach and (ii) assess organizational and human factors of nurses and other relevant health workers to accelerate adoption into nursing and interprofessional practice.

2 | METHODS

2.1 | Study design

According to the study's descriptive aim, a qualitative research design was performed using inductive content analysis that allowed the authors to systematically organize data from a semi-structured interview study in a structured way (Vaismoradi et al., 2013). Data were reported here according to consolidated criteria for qualitative research (Tong et al., 2007).

2.2 | Data collection

Preliminary data on the clinical pathway and hospital organization were collected within a desk analysis to help the interview guide design and facilitate interviews. The desk analysis was conducted but not limited to sepsis' regional regulations, clinical guidelines, hospital data, and terminology. Subsequently, data were collected within a semi-structured interview study between November 2020 and December 2021. The interviews were undertaken by two researchers (S. M. and M. C.) either in face-to-face or telematic mode (via Skype or Teams) depending on the availability of the respondent and the

COVID-19 restrictions at the time. One researcher worked as co-facilitator, ensuring that each interview was audio-recorded and observed participants' non-verbal behaviour utilizing a specific observation grid. Before starting each interview, opening instructions were provided. A multidisciplinary expert panel defined the interview guide, including specific questions to guide the discussion (Table 1). The interviews had an average duration of 50 min. Interviews were conducted until saturation—defined as no new themes emerged—was reached. The transcripts were returned to participants for comments and corrections, and no interviews were repeated.

2.3 | Participant selection and setting

Senior nurses and other expert non-nursing professionals were recruited at San Donato Hospital (Arezzo, Italy) alongside the clinical study based on purposeful sampling (Morse & Field, 1995). We employed the snowball technique (Naderifar et al., 2017) to enrol nursing staff, nursing directors, nursing managers, and non-nursing professionals across other teaching hospitals in Tuscany Region (Italy) with deep know-how in managing and treating sepsis. Purposive sampling was guided by the research aim to obtain the saturation of the topics under study. An over-recruitment was performed to allow for potential dropout. Participants were contacted via email and informed about the study aims. If participants agreed to proceed with the recruitment, they received further information and the interview protocol (Table 1). The participant sample consisted of 16 nurses (10 at the target site and six across other hospitals), seven physicians (five at the target site and two across other hospitals), and two laboratory technicians, all recruited at the target site. Participants' socio-demographic characteristics are summarized in Table 2.

2.4 | Data analysis

Two researchers (S. M. and M. C.) debriefed immediately after each interview to share their observations and facilitate the recording of essential details; transcribed each interview verbatim; made notes while reading; identified key sentences and words to freely generate emergent themes; grouped, organized and abstracted themes; discussed data saturation considered the achievement of replication in themes. Two researchers (A. D. B. and E. L.) independently read the transcripts and defined codes and themes. The inductive content analysis was conducted with NVivo V.10.1.1 software (QSR International, Melbourne, Victoria, Australia). Finally, the team of four researchers discussed themes and sub-themes to define them more clearly and reach a consensus. Three senior participants checked the agreed version of themes and sub-themes, and their views were incorporated into the final version (Table 3).

The desk analysis let the authors draft a preliminary version of the current sepsis' clinical pathway mapping at the target site. The process-flow model was designed using the Business Process Mapping Notation, an engineering technique exploiting graphical symbols to represent the flow of actions in a business-like logic. The initial version of the model was employed to facilitate interviews, and subsequent versions, including pathway redesign, were created using insights from interviews. The clinical pathway was mapped into three hospital units: (i) Emergency Department; (ii) internal or post-operatory medicine (e.g., geriatrics, infectious diseases, gynaecology, and traumatology); and (iii) hospital laboratory medicine.

2.5 | Rigour

The criteria of credibility, transferability, dependability, and confirmability ensure the trustworthiness of this qualitative study (Data S1) (Polit & Tatano Beck, 2020).

2.6 | Ethical considerations

The study was approved by the Ethical Committee for Clinical Experimentation of the Tuscany Region South-Est on the 20th of May 2019 (Approval Number 14911). It was conducted following the principles of the Declaration of Helsinki ('World Medical Association Declaration of Helsinki,' 2013). The engagement of nurses and other professionals was based on voluntary participation, and informed consent was presented before the interview. Transcriptions were stored in a server protected by a password and accessible only to the team members. An alphanumeric code was given to each participant to guarantee confidentiality.

3 | RESULTS

3.1 | Clinical pathway mapping

The current clinical pathway (Data S2) was redesigned, considering changes to tasks and responsibilities, highlighted in red, that the introduction of the new integrated approach required (Figures 1 and 2).

Combining the novel biomarker test into a novel predictive machine-learning-based algorithm mainly changed the *identification* process. The new biomarker test was performed at the end of the observation task, between the vital sign acquisition and the investigation for inflammatory markers. Given the optimal diagnostic accuracy for sepsis prediction, the biomarker test allowed to quickly target a patient as suspected sepsis. At this point, a prototype version of the smart predictive tool incorporated the biomarker values along with other vital signs. The machine-learning algorithm outcomes were interpreted and combined with clinical judgements by physicians—in the first instance—and subsequently by nurses when a sort of standardization was reached. Changes to the process-flow diagram involved only the case of patients characterized by non-specific and non-severe symptomatology, that is, 'patients with suspected sepsis but unconfirmed infection' according to the definition of the sepsis' international guidelines (Evans et al., 2021), as the integrated approach can improve only the identification phase (supplementary material S3).

TABLE 1 The interview guide

Semi-structured interview protocol

1. **CLINICAL PATHWAY MAPPING**
   The first part of the interview protocol is addressed to health care professionals recruited at the target site.
   a. **Professional's general information**
      i. Which department do you pertain in san Donato Hospital?
         1. Emergency department
         2. Internal medicine (i.e., infectious disease and geriatrics)
         3. Hospital laboratory medicine
      ii. Which role do you have?
         1. Nurse/nursing manager
         2. Laboratory technician
         3. Physician/clinical manager
      iii. How many years of professional experience do you have?
   b. **Current organizational model**
      Please draw the current clinical pathway and answer to the following questions.
      i. Can you explain in detail the process of care delivery in your department from patient arrival in case of sepsis/suspected sepsis? Please describe tasks, activities, and responsibilities.
      ii. Who are the relevant professionals you interact with alongside the care delivery process?
      iii. What are the main issues related to the identification and (early) treatment of sepsis?
      iv. Which hospital departments you interact with the most alongside the care delivery process?
      v. Please describe current clinical protocols for patient data exchange.
   c. **New organizational model**
      Please edit the current clinical pathway by drawing with a red pen the changes introduced by the new combined approach.
      i. What are the changes induced by the new combined technologies into the current care delivery process?

2. **USABILITY AND ACCEPTABILITY**
   The second part of the interview protocol is addressed to health care professionals recruited at both the target site and other hospitals in Tuscany region.
   a. **Professional's general information**
      This sub-section is addressed to health care professionals from other hospitals only.
      i. What hospital do you work in?
      ii. What department/clinical specialty do you pertain?
      iii. What is your professional role?
      iv. How many years of professional experience do you have?
   b. **Usability**
      Please assess the following aspects related to the combined technological approach by explaining your perceptions, feelings, and feedbacks.
      i. Perceived ease of use
      ii. Perceived usefulness
      iii. Perceived experience
      iv. Perceived performance
      v. Perceived safety
      vi. Need for the integration of other professional skills
      vii. Barriers and facilitators of use
   c. **Acceptability**
      i. Workload change
      ii. Workload quality
      iii. Satisfaction
      iv. Potential benefits in terms of reduction of verse clinical outcomes
      v. Potential benefits in terms of use of resources
      vi. Potential benefits in terms of organizational process optimization and risk/failure reduction
      vii. Barriers and facilitators to adoption
   d. **Contacts**
      i. Can you give us the contact (i.e., email, telephone number) of other colleagues that are involved in the management and treatment of sepsis patients?

3.2 | Drivers to the adoption

We identified three main emergent themes in the semi-structured interviews: (1) organizational change, (2) human factors, and (3) emotional perceptions. Each theme contains several sub-themes (Table 3).

3.2.1 | Organizational change

Nurses were identified as the primary professional category affected by the organizational change induced by the novel integrated approach and those who mainly required a speeding-up of a new hospital organizational configuration. In terms of workload, nurses

TABLE 2 Participants' socio-demographic characteristics

	Sample (N)	Percentage (%)
Distribution by gender		
Male	10	40%
Female	15	60%
Total	25	100%
Distribution by age		
30–49 years	17	68%
50–62 years	5 18,76	20%
63–70 years	3	12%
Distribution by years of experience		
10–19 years	17	68%
20–29 years	3	12%
30 years or more	5	20%
Distribution by hospital		
Target site	17	68%
Other hospitals	8	32%
Distribution by professional role		
Nurse managers/directors	6	24%
Nurse staff	10	40%
Physicians	7	28%
Lab technicians	2	8%
Distribution by hospital department		
Management	3	12%
Emergency department	10	40%
Infectious disease	5	20%
Geriatrics	5	20%
Laboratory	2	8%

felt the novel biomarker test was a suitable tool that did not involve additional activities since it was included in the routine task of a standard blood count test planned in the current clinical pathway. On the other hand, nurses were worried about the workload increase due to the introduction and use of the predictive algorithm and the training needs for practical use and interpretation of the new instrument. The manual entry of several medical measurements (e.g., vital parameters, clinical observations, family, and medical histories) along with the biomarker value through a PC interface; the need for training to interpret algorithm results; the potential need for technical support during the use of the tool in case of malfunctions were perceived as additional tasks to their consolidated activities and work routines. Moreover, nurses agreed with the proposal of physicians to introduce the new technology in the middle of the identification phase, conditioning its use on clinical judgement and qualitative observation, as it was targeted at patient groups more vulnerable to the current approach, that is, defined as 'patients with suspected sepsis but unconfirmed infection' by Evans et al. (2021). The number of the biomarker tests in the hospital can impact the speed and timing of diagnosis, that is, the availability of a single diagnostic tool to be shared between multiple departments could slow down the whole process in the identification phase. Hence, the suitability to define specific and shared procedures for managing and using the available biomarker tests was highlighted during nurses' interviews.

3.2.2 | Human factors

Nurses highlighted the rapidity of the test biomarker execution and the algorithm time processing, and the need to refine the development of the smart prototype (e.g., PC interface). As further development orientation, nurses stressed the opportunity to avoid the step of manual entry of data by co-designing a next-generation tool that automatically incorporated data from different hospital sources, such as electronic health records and monitoring devices acquiring vital signs. Moreover, a future development was perceived as implementing the biomarker to make it portable.

The resource use was highly dependent on the context where the analysis was conducted. The sepsis analyser resulted efficient in hospitals with a large team of trained health care professionals and laboratory technicians that can immediately perform the test. Although it remains a tool that can provide a great information source concerning early diagnosis, the results provided by the new integrated approach, on the other hand, can lead to a bias for health professionals who could rely all the decision-making on the algorithm outcome, forgetting the importance of clinical judgement integration, which remains fundamental.

3.2.3 | Emotional perceptions

The adoption of the novel integrated approach significantly influenced nurses' routine work. Nurses agreed that a new biomarker parameter with a good predictive power, which can potentially be incorporated into the predictive algorithm along with other vital-sign data, could better support the decision-making process and speed up the patient treatment through the early administration of antibiotics. The increase of the biomarker value was perceived as key to helping physicians and, consequently, nurses in early diagnosis and prospective evaluations even before the symptoms of sepsis are fully clear, particularly in the case of 'patients with non-specific and non-severe symptomatology' (Evans et al., 2021). The set of actions to perform the new biomarker test was maintained the same; however, there was an increasing trend of requests to perform standard blood count tests to assess the biomarker values for a suspected sepsis patient. This slight change in the process, which mainly affected laboratory technicians (Data S4), meant a significant improvement in professional satisfaction in the long term. Despite the workload increase due to data insert and interpretation of the machine-learning-based algorithm, nurses sought to promote adoption, which in a long time could lead to an improvement in their satisfaction and comfort/mental wellbeing.

TABLE 3 Results of the content analysis: Emergent themes and sub-themes from semi-structured interviews

Theme	Sub-theme	Verbatim quotation
Organizational change	Nursing routinary task	'Measuring MDW values does not add new activities because the blood sample can be taken from the patient as a part of a standard blood test. [..] A standard blood test is a routinary task both for confirmed and suspected sepsis (...)' [nurse, san Donato Hospital]
	Trust in technological innovation	'Arriving at a trusted version of an AI/ML algorithm assessing sepsis' patient risk stratification and scores will be a long process requiring interprofessional skills integration. I, personally, trust technological innovation and think it can be a valuable help in my daily work.' [nurse manager, san Donato Hospital]
	New professional role	'It is necessary to demonstrate, in some ways, that relying on an automatic algorithm for (sepsis) detection stratification does not lead us to an additional overload increase (...). We are working understaffed. What about thinking about new professional roles, such as 'specialized IT nurses' according to the UK model, for instance?' [clinical manager, san Donato Hospital]
	Infrastructure	'(...) every day, we face the limitations of the hospital's technological infrastructure, which is limited by bandwidth, obsolete, and slow. (...) moreover, to date, we have no form of information and database integration, even between different departments of the same hospital. I do not see AI/ML as a priority now. We must invest in redesigning current infrastructure and realizing data integration as starting points and see facts before talking and think big.' [nurse manager, other hospitals in Tuscany]
	COVID-19's pressure	'The wakes of COVID-19 pandemic have fostered the use of both [the combined technology] in the wards of ordinary hospitalization (emergency department, geriatrics, infectious disease, gynaecology, post-surgical department). In this sense, the health care emergency has legitimized this innovative approach among doctors, becoming a routinary tool faster than ever. We (nurses) have benefited from its standardization'. [nurse, san Donato Hospital]
	Laboratory workload	'To avoid an increased workload for lab technicians, the company should win the tender to become routine technology in CBC test reporting.' [laboratory technicians, san Donato Hospital]
	Innovation uptake	'The ML tool can surely bring us benefits in the medium-long term. However, in the short term, we [nurses] see an increase in our daily work due to the manual entry of several parameters; the need for training; the potential need for IT support; the need to interface with physicians and other colleagues to be sure to interpret scores' algorithm correctly.' [nurse, san Donato Hospital]
	Centralization of treatment	We need to centralize sepsis diagnosis in hospital practice to guarantee a high standard of equity and care and reduce unwarranted variabilities across hospitals through new technologies and highly skilled professionals. [clinical manager, san Donato Hospital]
Human factors	Decision-making tool	'There may also be a kind of a tendency to rely more on the diagnostic algorithm result than on professionals' competencies and experiences.' [physician, san Donato Hospital]
	Future development	'We need to bring this technology to the patient's bedside and make it portable to speed up MDW detection. Sepsis evolves quickly, so we do not have much time, and sending samples to the lab wastes valuable time.' [clinical manager, san Donato Hospital]
	Usability and acceptance	The diagnostic machinery is very easy to use, set up and maintain, but the lack of a user interface is a not trivial limitation for our [laboratory technicians'] work. The absence of an automatic data transmission protocol and the difficulty of approaching the ML algorithm make the training phase quite challenging for us. [laboratory technician, san Donato Hospital]
Emotional perceptions	Frustration and unsatisfaction	'It is very frustrating when patients arrive in the emergency room with no specific symptoms and their conditions worsen within a short period, putting their lives at risk. I feel helpless and many times wonder if I have done enough.' [nurse, san Donato Hospital]
	Support need	'We [nurses] need support in identifying sepsis because the numbers are incredibly significant and the current standard of care is insufficient to play this battle fairly. We feel left to ourselves.' [nurse, san Donato Hospital]
	Learning plasticity	We're used to being flexible and dynamic in our work in the emergency department, so learning how to use new technology and a new protocol would not be a big deal.' [nurse manager, san Donato Hospital]
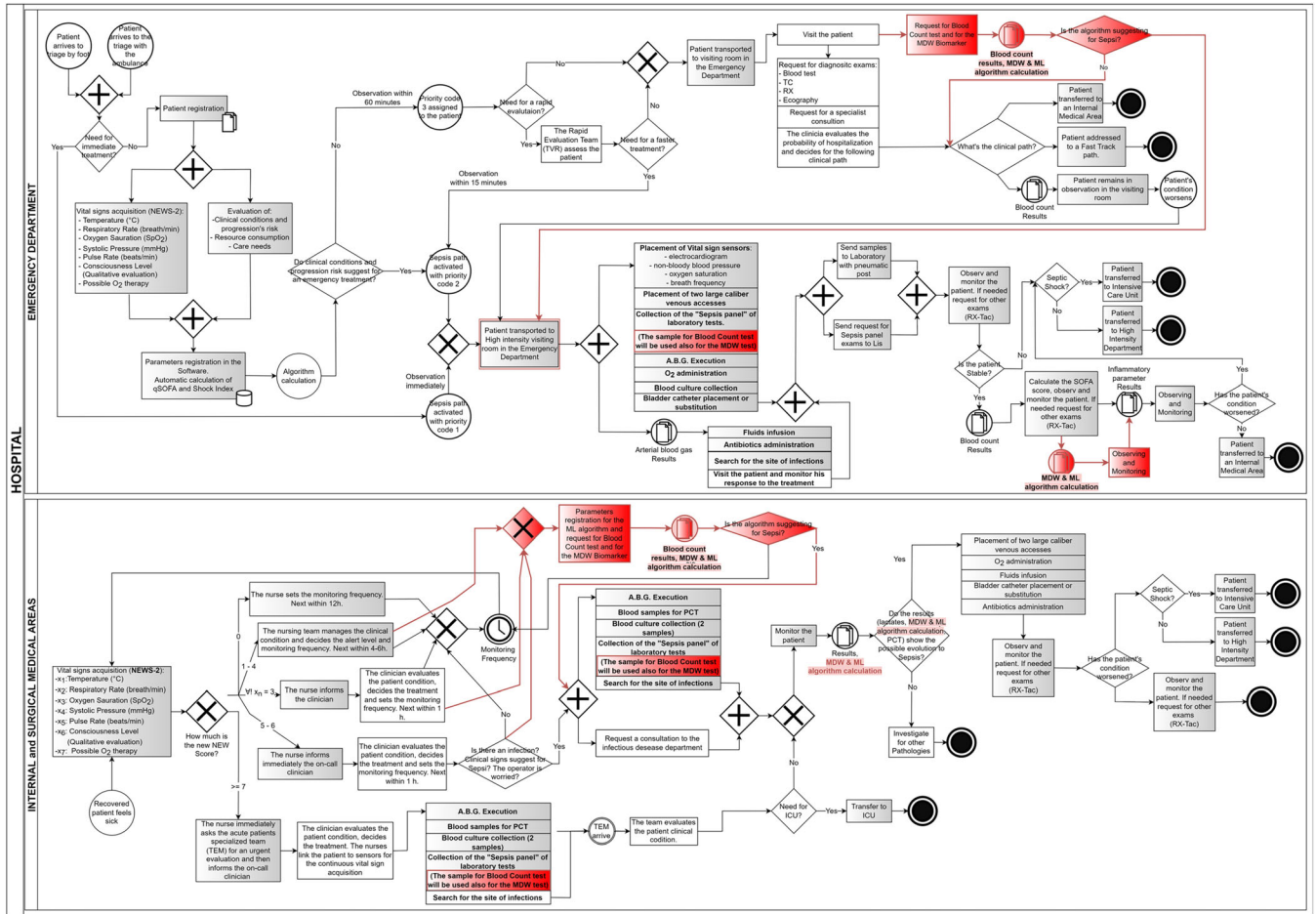
FIGURE 1 Process flow of emergency department and internal and surgical departments. In grey, the activities and tasks performed by nurses; in red, the activities introduced by the new technology combined (MDW analyser and ML algorithm).

4 | DISCUSSION

This study aimed to redesign the current sepsis' clinical pathway after introducing a novel combined approach for early diagnosis. Furthermore, we investigated human and emotional drivers of adopting a novel machine-learning algorithm that is predictive of sepsis and incorporates Monocyte Distribution Width, a novel biomarker recently validated in hospital practice. The study benefited from the observational clinical study started in June 2019 at San Donato Hospital (Arezzo, Italy) and is still ongoing. In this sense, our study shed new light on multidimensional factors that may positively or negatively influence the adoption process and the specific needs of the complex interprofessional hospital ecosystem.

The emergent themes highlighted concern in particular aspects of organizational change, human factors, and nurses' emotional perceptions.

Regarding organizational change, the inclusion of the biomarker test in clinical practice does not seem to modify nursing routinary tasks, as the blood sample can be taken from the patient as part of a standard count blood test, which is a usual activity both for confirmed and suspected sepsis. Moreover, nurses expressed confidence that

the machine-learning tool will benefit them in the medium to long term and the awareness of the need for interprofessional skills integration. However, in the short time, they perceived an increase in their daily work related to the machine-learning component due to manual entry of different parameters, the need for training, the potential need for technical support, and the need to interface with physicians and other colleagues to be sure they are interpreting the algorithm score correctly. At the same time, some nurses perceived the priority of investment in infrastructure and specific projects to realize data integration rather than in machine-learning development. Some of them support the idea of defining a new role for nurses dedicated to Information Technology (Zadvinskis et al., 2018).

Laboratory technicians perceived an increase in their workload activity for the need to retest the blood sample. This aspect did not represent a constraint in other hospital settings, where the biomarker analyser is the primary machine to perform standard blood count tests.

Physicians were very interested in technology adoption both in terms of work simplification, thanks to the introduction of a new tool to reduce discretion, and better patient care, especially compared with the increased tendency to incur legal issues. At the same
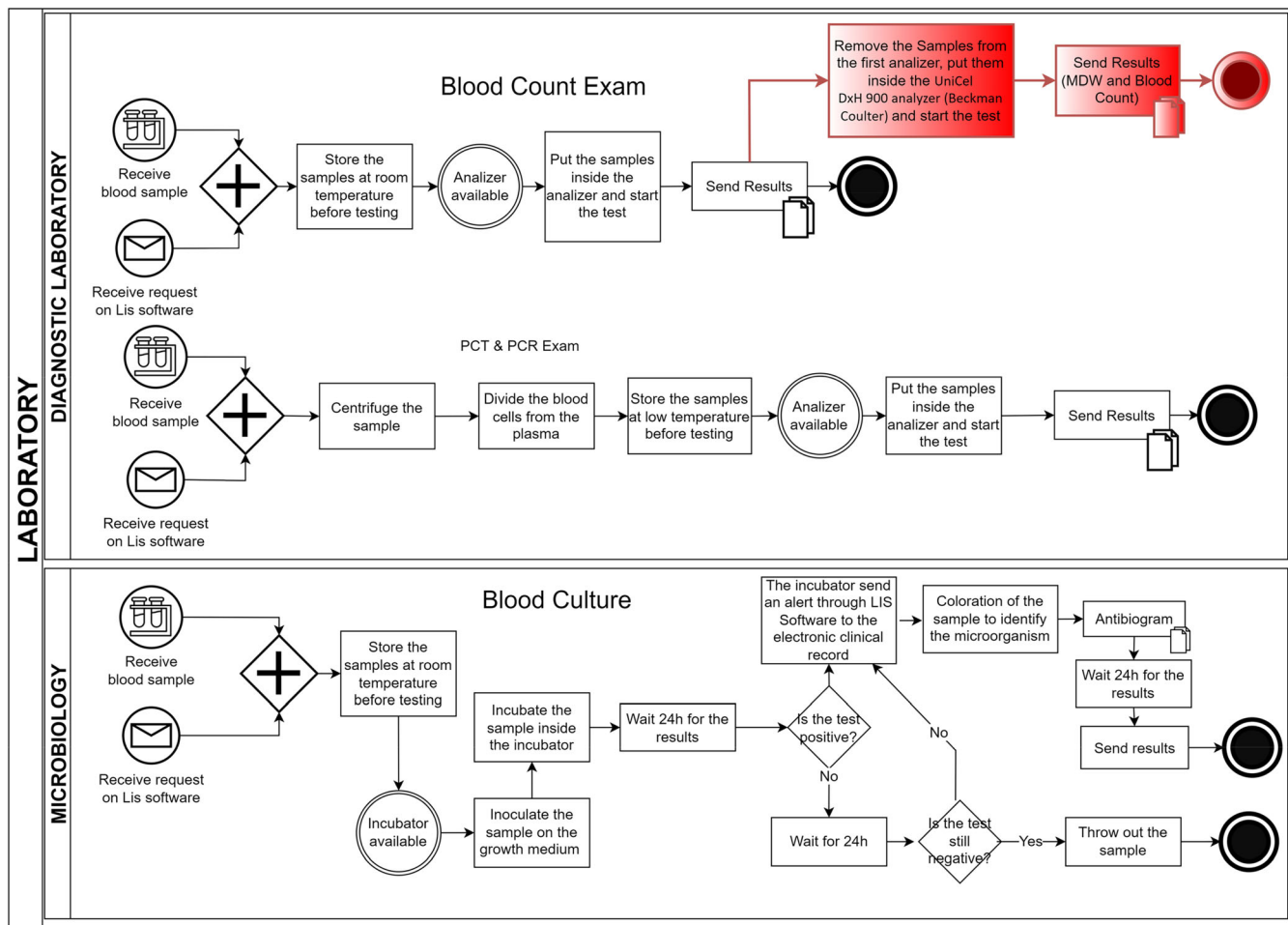
FIGURE 2 Process flow of hospital laboratory medicine. In grey, the activities and tasks performed by nurses; in red, the activities introduced by the new technology combined (MDW analyser and ML algorithm).

time, consistent with recent literature, an important theme emerging by physicians was the need to centralize sepsis diagnosis in hospital practice to guarantee a high standard of equity and quality of care and reduce unwarranted variabilities across hospitals through the use of new technologies and highly skilled professionals (Evans et al., 2021). Physicians used the new combined technology during the COVID-19 pandemic to identify sepsis early in hospitalized patients. This facilitated the subsequent widespread use of this technology by Emergency Department nurses (Ognibene et al., 2020).

The need for organizational change was considered one of the most critical barriers that could be mitigated by reconfiguring the service and the professionals involved to create the conditions to exploit all the advantages of the new technology. For example, one of the solutions proposed by the stakeholders, useful to optimize the time related to the execution of the test and the tracking of the instrument, was to provide the availability of a portable diagnostic device at the bedside of the patient, which would allow accurate identification of the pathology in a short time and a substantial reduction in the time to antibiotics.

The other two main emergent themes are human factors and nurses' emotional perceptions. In particular, some nursing staff interviewed reported the risk of relying more on the algorithm results than on professionals' competencies and experiences. Indeed, the diffusion of machine-learning systems in clinical and nursing practice leads to questioning of new ethical and legal issues. Physicians and nurses are the principal responsible for patient care outcomes; if technology is necessary and helpful support, it does not replace professionals' skills and judgement. Systems and technologies that assist in clinical practice are added to, not replacements for, the health care professionals' knowledge and skills (Evans et al., 2021; Fowler, 2015). One of the critical concerns of artificial intelligence practitioners today is managing bias. Every health care professional who uses new technologies or helps build them has a responsibility to ask about the data used to train the system and how the system results are checked for bias (Robert, 2019). Another bias to consider is the transparency of the algorithm. Adopting a new artificial intelligence system requires that operators understand how the machine-learning processes the results. Health care professionals need to understand and trust the artificial intelligence's recommendations and how the computer makes its

decision. For this reason, an important question to ask the management when implementing new technologies is how the results will be monitored to judge the accuracy of recommended decisions. New ethical stances help artificial intelligence teams solve bias issues by making specific statements about the fairness, accountability, and transparency of data used in building machine-learning systems (Robert, 2019).

A series of final recommendations by exploiting the study results were drawn for the Italian national health system and public institutions to facilitate the adoption of the novel combined technology in hospital practice.

Firstly, while current regional and national guidelines tried to reduce inter-hospital variation in sepsis treatment, at the same time, they over-generalized the complexity around sepsis without ad-hoc treatment procedures. For this reason, the novel combined approach may become a driver for a more automatized, personalized, and patient-centred way of organizing sepsis management and treatment, where the new biomarker test would be a key parameter for defining and stratifying patient risk. The novel combined technology could help identify unestablished signs or symptoms that can reliably predict sepsis by combining the biomarker values with other clinical parameters collected from different sources into a trusted machine-learning algorithm (Islam et al., 2019).

Secondly, the management of change following the introduction of the novel approach in clinical practice should support doctors and nurses through different strategies, including training programs, the availability of expert professionals during the implementation of the diagnostic algorithm and the possibility of reporting critical issues for improvement relating to clinical, organizational, ethical, and legal aspects, during and after the adoption phase.

Thirdly, the new combined technology adoption is related to the proper dissemination to the public and society, including public awareness campaigns. Commissioners and policymakers need to be aware of the complexity of sepsis management and the scaling-up to promote a redesign of the whole system and overcome other potential barriers, such as privacy and security issues and technical problems, such as data formatting and network architecture. Finally, strong collaboration and cooperation between all actors involved in the adoption process are vital in achieving prospective diagnosis and early treatment.

5 | LIMITATIONS

This study presents several limitations to be considered, mainly related to the exploited qualitative methodology. The sample of respondents was not randomized but based on a convenience sample and collected on a voluntary basis, incurring the risk of introducing a recruitment bias. A snowball technique was used for enlisting respondents. It may have generated a positivist trend, as the most prone stakeholders to change and innovation may be the most interested in being recruited.

6 | CONCLUSIONS

This study investigated multifactorial drivers of different professional groups that are crucial to facilitating technology adoption in hospital practice. Studies that combine clinical pathway mapping and qualitative analysis can be a great tool to support disruptive technology innovation. The novel business-oriented solution, based on machine-learning for sepsis early detection, requires interprofessional integration, new professional roles, infrastructure improvement, data integration, and new ethical/legal rules to guarantee transparency to be effectively implemented. Lessons learned from this study suggest the need to involve nurses in the early stages of the design of new machine-learning technologies and the importance of training nurses on sepsis management through the support of disruptive technological innovation.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

The insights of the study may be relevant for nursing and hospital management.

Firstly, predicting sepsis using machine learning could significantly improve patient safety, quality of care, and clinical performance indicators, guiding nurses and physicians to actively monitor and take preventive actions to improve the patients' condition. The adoption of the combined technology for early detection of sepsis may save health care resources and increase the desired sensitivity or specificity, resulting in a decreased number of false alarms and with a positive impact on all the dimensions of quality improvement, that is, appropriateness, effectiveness, efficiency, accessibility, timeliness and safety (Islam et al., 2019; Wu et al., 2021),

Secondly, the use of machine learning in the daily practice of nurses enhances their role in the early identification of sepsis and provides visibility and professional satisfaction, preventing health professionals' unhappiness, frustration and anxiety (Gonçalves et al., 2020).

Thirdly, nurse managers are called upon to encourage continuous training for their staff about sepsis management and implementing a standardized protocol, bundle, and guidelines into clinical practice (Kleinpell, 2017).

Finally, key factors that positively influence the adoption of new machine-learning tools are represented by peer influence and stakeholder involvement from the early stages. The user experience helps ensure convergence between the needs of health care professionals, also related to the organizational context, and the possibilities offered by the new technologies, thus promoting their adoption in professional practice. The involvement of nurses and other health care professionals in the early development stages of a new machine-learning system design allows the sharing of scientific knowledge, theoretical skills and experiences that guide the development of the new project in a patient-centred way.

Nurses are increasingly called upon to participate in such ethical assessments concerning artificial intelligence projects applied to clinical practice to ensure the best possible care for each patient. Nursing

experience, knowledge, and skills increasingly require learning new ways of thinking about information processing. If artificial intelligence technologies can increasingly support nurses, they will never be replaced by them (OMS, 2019).

ACKNOWLEDGMENTS

CONFLICTS OF INTEREST

The authors declare no competing interests.

ETHICS STATEMENT

The study was approved by the Ethical Committee for Clinical Experimentation of the Tuscany Region South-Est on the 20th of May 2019 (Approval Number 14911). It was conducted following the principles of the Declaration of Helsinki. The engagement of nurses and other professionals was based on voluntary participation, and informed consent was presented before the interview. Transcriptions were stored in a server protected by a password and accessible only to the team members. An alphanumeric code was given to each participant to guarantee confidentiality.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

REVIEW ARTICLE

WILEY

Artificial intelligence based prediction models for individuals at risk of multiple diabetic complications: A systematic review of the literature

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Abstract

Aim: The aim of this review is to examine the effectiveness of artificial intelligence in predicting multimorbid diabetes-related complications.

Background: In diabetic patients, several complications are often present, which have a significant impact on the quality of life; therefore, it is crucial to predict the level of risk for diabetes and its complications.

Evaluation: International databases PubMed, CINAHL, MEDLINE and Scopus were searched using the terms artificial intelligence, diabetes mellitus and prediction of complications to identify studies on the effectiveness of artificial intelligence for predicting multimorbid diabetes-related complications. The results were organized by outcomes to allow more efficient comparison.

Key issues: Based on the inclusion/exclusion criteria, 11 articles were included in the final analysis. The most frequently predicted complications were diabetic neuropathy ($n = 7$). Authors included from two to a maximum of 14 complications. The most commonly used prediction models were penalized regression, random forest and Naïve Bayes model neural network.

Conclusion: The use of artificial intelligence can predict the risks of diabetes complications with greater precision based on available multidimensional datasets and provides an important tool for nurses working in preventive health care.

Implications for Nursing Management: Using artificial intelligence contributes to a better quality of care, better autonomy of patients in diabetes management and reduction of complications, costs of medical care and mortality.

KEYWORDS
artificial intelligence, diabetes, prediction models, prediction of diabetes complications

1 | INTRODUCTION

Due to the increased morbidity in recent years, it is estimated that 642 million people will be diagnosed with diabetes in 2040 (Zou et al., 2018). Therefore, it is particularly crucial to assess and predict the level of risk for diabetes and its complications (Erandathi et al., 2020). Given the high prevalence, many researchers and physicians have developed various detection techniques based on artificial intelligence (AI) to approach problems better and avoid human error (Sharma & Shah, 2021). AI research in health care is rapidly accelerating in various fields of medicine (Kelly et al., 2019). The introduction of new technological advances will allow greater autonomy and more personalized treatment of patients (Briganti & Le Moine, 2020). AI has great potential to enhance the care of common chronic conditions significantly (Tarumi et al., 2021).

2 | BACKGROUND

Managing chronic diseases is challenge for patients and health care providers (Tahri Sqalli & Al-Thani, 2020). Diabetes mellitus (DM) is a chronic disease that is becoming increasingly worrying due to its high morbidity and is considered life-threatening (Jian et al., 2021; Sharma & Shah, 2021). In DM2, it leads to an insulin resistance response, with a consequent decrease in insulin production. This occurs most often in people over 45 years of age (Goyal & Jialal, 2022). Eventually, it can affect any part of the body, causing serious complications (Jian et al., 2021), which can lead to multiple organ failures and have an impact on quality of life (Chaki et al., 2020; Ramesh et al., 2021). It is associated with a shorter life expectancy due to a higher risk of developing various diseases such as heart disease, stroke, blindness and amputation (Shah & Vella, 2014).

Diabetes-related complications are a concern because they are unrecognized in the early stages of their development. Over time, they can become immutable and devastating, so identifying a high-risk population and developing regular monitoring is crucial for prevention (Mosa et al., 2021; Ramesh et al., 2021). Complications range from acute complications, which are life-threatening conditions (hypoglycemia or ketoacidosis), to chronic, longer-lasting complications that can affect multiple organ systems (retinopathy, nephropathy, neuropathy, cardiovascular disease) (Nickerson & Dutta, 2012).

Patients with diabetes often have multimorbidity. The mentioned state describes several concomitant conditions with a significant impact on patient care and life quality (Chima et al., 2017). Predicting the development of disease complications is a demanding process due to the existence of unmeasured risk factors, unbalanced data, time-varying dynamics data and various interventions for the disease (Yousefi & Tucker, 2020).

Accurate prediction of complications could help with more targeted measures to prevent or slow their development (Ljubic et al., 2020). AI with predictive analytics has great potential to improve the care of common chronic conditions with high morbidity and mortality and an important role in maintaining a healthy lifestyle,

taking medication and monitoring glycemic status (Behera, 2021; Tarumi et al., 2021). AI is the use of computers and advanced technologies to simulate intelligent behaviour and critical thinking (Malik et al., 2019). It is often used to support health care staff to carry out tasks ranging from administrative work to patient monitoring (Bohr & Memarzadeh, 2020).

The use of AI can provide significant improvements in all areas of health care from diagnosis to treatment (Bohr & Memarzadeh, 2020). Studies show that AI methods are gradually being established as suitable for diabetes self-management (Contreras & Vehi, 2018). The challenge for the use of AI in these areas of health care is not whether the technologies are effective and useful but to ensure that they are introduced into everyday clinical practice (Davenport & Kalakota, 2019). The use of AI would relieve the burden on health care professionals and increase the quality of work performed by reducing the possibility of errors and increasing accuracy (Aung et al., 2021).

The purpose of this systematic literature review is to determine the effectiveness of predicting multimorbid diabetes-related complications with AI-based models and determine which methods provide the best results in terms of prediction performance.

3 | METHODS

The literature review was conducted according to the recommendations of Khan et al. (2003). In the first step, we addressed the review question: 'Which AI-based approaches are suitable for predicting multiple diabetes-related complications?'. By answering this question, we have identified which techniques can help reduce the risk of complications and help diabetes care. In a second step, we set inclusion and exclusion criteria and restrictions for the selection of the literature, which are presented below. We used the keywords 'artificial intelligence', 'diabetes mellitus type 2', 'prediction of complications' and other synonyms (Table 1) in PubMed, CINAHL, MEDLINE and Scopus databases to search the literature. It needs to be noted that we only focus on AI-based prediction models in this review, while other AI-based approaches (e.g. AI-based solutions in imaging or speech or text recognition or generation) are also present in the literature. The complete search strategy is shown in supporting information S1. The relevance and quality of the studies were assessed by two authors, who evaluated the eligibility of the articles based on predefined inclusion and exclusion criteria. In the last two steps, two authors extract the data from the articles and display them using an identification table. The results were then interpreted and discussed by all authors.

To select relevant articles, we set the following inclusion criteria: (a) quantitative (e.g. case studies, randomized controlled trials, controlled trials), qualitative (e.g. interview, questionnaire, focus groups) studies and mixed-method studies; (b) relating to the research topic of predicting multimorbid complications in diabetes using AI and (c) in the English language. Only studies with patients already diagnosed with diabetes were included in the study. Additionally, we included only studies where the prediction of multimorbid complications

TABLE 1 Search strategy

#	Keywords
1	'artificial intelligence' OR AI OR 'machine learning' OR 'deep learning' OR 'data mining' OR 'predictive models' OR 'predictive modelling' OR 'prediction model' OR 'neural network' OR 'deep learning' OR 'decision tree' OR 'random forest' OR 'nearest neighbours' OR 'support vector machines' OR 'gbm' OR 'gradient boosting'
2	'diabetes mellitus type 2' OR 'type 2 diabetes' OR 'type 2 diabetes mellitus' OR 'noninsulin-dependent diabetes' OR 'diabetes mellitus, noninsulin-dependent' OR 'diabetes mellitus, noninsulin-dependent' OR 'diabetes mellitus, noninsulin-dependent' OR 'adult-onset diabetes' OR 'diabetes mellitus, adult-onset' OR 'diabetes mellitus, ketosis-resistant' OR 'diabetes mellitus, maturity-onset' OR 'diabetes mellitus, slow-onset' OR 'diabetes mellitus, stable' OR 'maturity-onset diabetes' OR 'maturity-onset diabetes mellitus' OR NIDDM OR T2DM OR 'diabetic patient'
3	'prediction of complications' OR 'prediction of diabetes complications' OR 'diabetes mellitus complications' OR 'retinopathy prediction' OR 'diabetic foot prediction' OR 'cardiovascular disease prediction' OR 'nephropathy prediction' OR 'neuropathy prediction' OR 'hypoglycemia prediction' OR 'hyperglycemia prediction'

associated with diabetes was done using the AI techniques (support vector machines [SVMs], decision tree [DT], random forest [RF], gradient boosting [GBM], neural network [NN]). Articles using exclusively regression models were not included in this study, although some might argue that some elements of machine learning are also present in this type of typically used prediction models in health care. Usually, regression models were used as a baseline model for comparison with other AI-based techniques. In such cases, we extracted the prediction performance results of the regression-based prediction models as well. The results we aimed to extract from each study were areas under the curve (AUC) with corresponding confidence intervals (CIs) or standard deviations (SD). Since some studies did not report the AUC results, we also extracted accuracy, sensitivity and specificity where available. The exclusion criteria were as follows: (a) other types of surveys, such as cross-sectional, observational surveys, summaries, commentaries, protocols and cohort studies; (b) duplicates between databases; and (c) articles that do not include AI-based prediction models and do not predict multimorbid complications as a consequence of diabetes. We did not include any publication date limits when searching for the articles.

Two authors assessed the adequacy of the studies based on inclusion and exclusion criteria. In case of disagreement, we resolved this by discussion between the authors. The two authors also extracted key results and information from the articles and presented them in tabular form (Table 2 and supporting information S2).

4 | RESULTS

Based on the search string, we found a total of 251 results in the databases. Of these, 38 articles included the prediction of diabetes-related complications, but only 11 hits included studies where two or more complications were predicted (Figure 1).

Table 2 presents the characteristics of the included studies.

Supporting information S2 presents the prediction performance results of the identified models (AUC, CI, accuracy, sensitivity, specificity) for predicting diabetes-related complications. Based on our systematic review, we found that models most often predict the risk of developing diabetic neuropathy ($n = 7$) (Dagliati et al., 2018; Fan et al., 2021; Lagani et al., 2015; Liu et al., 2020; Ljubic et al., 2020; Ozdemir et al., 2020; Wang et al., 2021) and diabetic nephropathy ($n = 6$). Slightly less frequently, the authors predicted the development of diabetic retinopathy ($n = 5$) (Figure 2). The most commonly predicted complication in the models, diabetic neuropathy, is also one of the most common complications of diabetes, leading to loss of sensory function in the patient (Feldman et al., 2019; Juster-Switlyk & Smith, 2016).

Patients diagnosed with type 2 diabetes are often at risk of developing multiple additional comorbidities (Cicek et al., 2021). Therefore, in our systematic review, we focused on models that allow the user to predict multiple complications. The model included at least two complications and up to 14 different complications or conditions caused by diabetes type 2.

The most common types of AI used by the authors in their work are regression, RF, Naïve Bayes and NN-based models. Dagliati et al. (2018) reported AUC values for three different models for three different forecast periods of 3, 5 and 7 years. We compared the AUCs for the 3-year forecasting models, and the AUCs were 0.489 for the SVM model, 0.5 for the RF model, 0.726 for the LR and 0.533 for the NB model. Accuracy was reported only for LR. SD or CIs were not reported. Fan et al. (2021) reported AUC of 0.847 ± 0.081 for XF, 0.787 ± 0.081 for CHAID and 0.720 ± 0.060 for QUEST. Lagani et al. (2015) reported AUC for predicting neuropathy in both type 1 and type 2 diabetes. T1DM (internal) was 0.6661, T1DM (external) was 0.735 and T2DM (external) was 0.4359. Liu et al. (2020) presented the AUC for the following models: BN (0.545), BN-wopi (0.685), NB (0.505), RF (0.516) and C5.0 (0.527). Ljubic et al. (2020) did not present the AUC in their paper but only gave the accuracy for all models at four, three and two visits. We present a comparison for four visits only and the values for the GRU RNN model with the accuracy of 0.746 ± 0.053, bidirectional GRU with 0.746 ± 0.053, 1-way LSTM with 0.719 ± 0.073, RF with 0.671 ± 0.033 and MLP with 0.668 ± 0.039. Ozdemir et al. (2020) reported the same result for AUC and accuracy resulting in an almost perfect classification performance of 0.99. Since no data or code was available, it is difficult to argue the robustness of their evaluation protocol. Wang et al. (2021) reported only accuracy. Multilabel classifier metric was used to estimate the accuracy of covering all three complications at once. BR (linear) resulted in accuracy of 0.685 ± 0.000, BR (poly) of 0.701 ± 0.000, BR (rbf) of 0.701 ± 0.000, WML-SSLM (linear) of 0.520 ± 0.001, WML-SSLM (poly) of 0.661 ± 0.002 and WML-SSLM (rbf) of 0.697 ± 0.002. If we exclude extremely optimistic results from Ozdemir et al. (2020), we can conclude with the observation that prediction performance in terms of AUC for the best model in the study

TABLE 2 Characteristics of the included studies

Authors (year)	Types of AI	Sample size	Data source	Diabetes-related complications	Findings
Aminian et al. (2020)	Regression (Cox proportional hazards, exponential and fine-grey) and random forest (RF)	287.438	Electronic health record from the Cleveland Clinic between 1998 and 2017.	All-cause mortality, coronary artery events, heart failure, nephropathy	The most important variables that contributed to the mortality model were age, BMI, history of heart failure, insulin use and smoking status. The IDC risk scores were better than RECODe in all outcomes examined, in terms of IPA, AUC and calibration. The final model is used as the IDC risk calculator, the online version of which is freely available at https://riskcalc.org or as a smartphone mobile app called BariatricCalc.
Dagliati et al. (2018)	Logistic regression (LR), naïve Bayes (NB), support vector machines (SVMs) and random forest (RF)	943	From electronic medical records collected by IRCCS (Istituto di Ricovero e Cura a Carattere Scientifico, meaning research hospital), Istituto Clinico Scientifico Maugeri (ICSM), Pavia Hospital, Italy.	Nephropathy, neuropathy, retinopathy	Authors recommend the use of the LR models as the difference in performance was not significant, while on the other hand, LR models provide a clear implementation of the coefficient values and can be presented in the graphical form as nomograms. The variables considered in the model were sex, age, time since diagnosis, body mass index, glycated haemoglobin, hypertension and smoking. Although AUC values were higher for SVM and RF when the data sets were balanced, SVM and RF models are more difficult to interpret in clinical practice. The final models, adjusted for complications, provided accuracies up to 0.838.
Fan et al. (2021)	Artificial neural network (ANN), Bayesian network (BN), chi-squared automatic interaction detector (CHAID), classification and regression tree (CRT), quick unbiased efficient statistical tree (QUEST), discriminate (D) and ensemble (XF) models	129	The data used were patient data collected at Sichuan Provincial People's Hospital from January 2010 to December 2015.	Diabetic nephropathy (DN), diabetic peripheral neuropathy (DPN), diabetic angiopathy (DA), diabetic eye disease (DED)	The variables that had the biggest impact were age, duration of type 2 diabetes, types of insulin and duration of unadjusted hypoglycaemic treatment. Of the 18 models used in the study, most were effective. The ensemble model was the best among the models for predicting diabetic nephropathy and diabetic angiopathy, and the

(Continues)

TABLE 2 (Continued)

Authors (year)	Types of AI	Sample size	Data source	Diabetes-related complications	Findings
					discriminate model was the best among the models for predicting diabetic peripheral neuropathy and diabetic eye disease. The authors state that the developed models, after validation and screening, can be used for clinical practice for patients with type 2 diabetes and for health care professionals.
Kim et al. (2019)	Least absolute shrinkage and selection operator (LASSO), gradient boosting machine (GBM)	81.091	Sourced from OptumLabs® Data Warehouse.	Ischemic heart disease (IHD), congestive heart failure (CHF), cerebrovascular disease (CVD), peripheral vascular disease (PVD), nephropathy	The model used in the research is learned from the national cohort and is externally validated, thus contributing to the transferability of the model. Four different models have been built. In internal validation, the predictive performance was very similar between the models. The model was implemented in two local health systems, the University of Minnesota Medical Center and the Mayo Clinic for external evaluation.
Lagani et al. (2015)	Cox regression, ridge Cox regression, accelerated failure time (AFT), random survival forest (RSF) and support vector machine censored regression (SVCR)	1.441	The data come from research diabetes control and complications trial (DCCT) in epidemiology of diabetes interventions and complications (EDIC).	Retinopathy, hypoglycemia, neuropathy, ketoacidosis, microalbuminuria, proteinuria	The model results range from 0.6024 to 0.8333, which means that they all have comparable predictive power. Future work by the authors will focus on validating the models to further strengthen the results obtained.
Lee et al. (2021)	Random survival forests (RSF), univariate Cox regression	25.186	Data on patients with type 1 and type 2 diabetes prescribed insulin in Hong Kong public hospital outpatient clinics from 1 January to 31 December 2009.	Mortality, renal, peripheral vascular disease (PVD), neurological, ophthalmological, ischemic stroke, atrial fibrillation (AF), heart failure (HF), intracranial haemorrhage (ICH), ischemic heart disease (IHD), acute myocardial infarction (AMI), osteoporosis, dementia	The authors of the article note that machine learning algorithms can further improve the prediction of the risks of an event occurring in patients with diabetes. According to the C-index evaluation, the model outperforms both RSF and Cox for mortality survival analysis. The model also shows higher prediction accuracy.

(Continues)

TABLE 2 (Continued)

Authors (year)	Types of AI	Sample size	Data source	Diabetes-related complications	Findings
Liu et al. (2020)	Bayesian network model (BN), bootstrap and Tabu search algorithm, Markov blanket (MB), decision tree model, Naïve Bayes model (NB), random Forest model (RF) and C5.0	1.485	The data were collected from the National Clinical Centre for Health between 1 January 2009 and 31 December 2009.	Diabetic nephropathy (DN), diabetic foot (DF), diabetic macrovascular complications (DMV), diabetic peripheral neuropathy (DPN), diabetic ketoacidosis (DK)	The BN model was selected as the best model based on the results and can be used as a general tool for disease prevention, monitoring and management. The BN model is effective for predicting diabetic nephropathy, diabetic foot, diabetic macrovascular complications and diabetic ketoacidosis.
Ljubic et al. (2020)	Advanced machine learning algorithms, recurrent neural network (RNN), long short-term memory (LSTM) and RNN gated recurrent unit (GRU RRN), bidirectional GRU, deep learning methods, random forest (RF) and multilayer perceptron (MLP)	*Four visits:* 19.589 *Three visits:* 26.973 *Two visits:* 26.973 *Four visits:* 26.973 *Three visits:* 44.688 *Two visits:* 62.016 *Four visits:* 52.959 *Three visits:* 81.658 *Two visits:* 147.718 *Four visits:* 56.343 *Three visits:* 78.732 *Two visits:* 135.492 *Four visits:* 8.576 *Three visits:* 12.030	Data are derived from state-level inpatient databases pertaining to health care costs and utilization in California for the period 2003 to 2011.	Angina pectoris Atherosclerosis Ischemic chronic heart disease (ICHD) Depressive disorder Hearing impairment	Based on the results, the authors concluded that it is the best of the analysed RNN GRU models, followed by the RNN LSTM. The RNN GRU model was more accurate (73%–83% vs. 66%–76%) compared with traditional models. RNN models were most accurate in predicting depressive disorder and IHD. The authors suggest that the models could be integrated into a clinical decision support system.

(Continues)

TABLE 2 (Continued)

Authors (year)	Types of AI	Sample size	Data source	Diabetes-related complications	Findings
		Two visits: 16.884		Myocardial infarction (MI)	
		Four visits: 38.380			
		Three visits: 52.896			
		Two visits: 92.961		Nephropathy	
		Four visits: 37.982			
		Three visits: 52.283			
		Two visits: 71.053		Neuropathy	
		Four visits: 49.060			
		Three visits: 69.053			
		Two visits: 99.825		Peripheral vascular disease (PVD)	
		Four visits: 48.565			
		Three visits: 67.686			
		Two visits: 93.905		Retinopathy	
		Four visits: 27.796			
		Three visits: 36.221			
		Two visits: 58.641			
Ozdemir et al. (2020)	Support vector machines (SVMs), extreme learning machines (ELMs) and artificial neural networks (ANNs)	72	It is not specified where the data are taken from. The data were taken from patients aged 30 years or older with a diagnosis of type 2 diabetes.	Neuropathy, neuropathic pain, kinesiophobia	Using computer-assisted clinical decision support systems, it can be effective in managing complications and motor dysfunctions.

(Continues)

TABLE 2 (Continued)

Authors (year)	Sample size	Data source	Types of AI	Diabetes-related complications	Findings
Shi et al. (2020)	4.219	Data obtained from a questionnaire, physical examination and biochemical tests of diabetic patients in Shanghai.	LASSO regression method, logistic regression	Diabetic nephropathy (DN), diabetic retinopathy (DR)	The authors found a moderately good differentiation and ability to confirm and predict the incidence of diabetic nephropathy and diabetic retinopathy. Seven variables were included in the logistic regression: disease course, BMI, TG, SBP, PBG, HbA1c and BUN.
Wang et al. (2021)	17.300	Not available.	Multilabel algorithms (BR, RankSVM, ML-KNN, ML-RBF, BP-MLL and WML-SSLM)	Macrovascular, microvascular, neuropathy	The authors propose a WML-SSLM model to predict complications due to diabetes.

Abbreviation: AI, artificial intelligence.

ranges from 0.685 up to 0.847. However, one needs to be aware that different studies employ different approaches to cross-validation and internal versus external evaluation which can influence the reliability of the reported results. In many cases, the description of the evaluation protocol is weak or even nonexistent.

Aminian et al. (2020) considered 26 different baseline variables (demographics, medical history, laboratory data, medications) for prediction in their study. In addition to classical regression models, machine learning approaches were also used. They found that cardiovascular events are among the most frequent complications in patients with type 2 diabetes and obesity. Dagliati et al. (2018) considered the following variables: sex, age, time since diagnosis, body mass index, glycated haemoglobin, hypertension and smoking status. LR after RF imputation identified risk factors for microvascular complications. Fan et al. (2021) used age, sex, duration of diabetes and duration of unadjusted treatment, insulin, the total cost of medications and number of medications, genetic history of diabetes and dyslipidemia. XF was the best performing model for predicting diabetic nephropathy and diabetic angiopathy, D for predicting diabetic neuropathy and diabetic eye disease and BN for HbA1c (Fan et al., 2021). Fifty-one clinical variables were used in the selected predictive models and included between five and fifteen risk factors depending on the specific outcome (Lagani et al., 2015). Lee et al. (2021) found that higher HbA1c and lipid measurements were associated with an increased risk of complications and various comorbidities. Ljubic et al. (2020) cite the RNN GRU model as the most accurate model, followed by the RNN LSTM model.

5 | DISCUSSION

When patients have additional chronic comorbid conditions, there is an almost exponential increase in the cost of care related to health care services, medicines and hospital admissions (McPhail, 2016). Complications resulting from type 2 diabetes, such as nephropathy, neuropathy, blindness, cardiovascular disease and amputations reduce their quality of life and increase mortality. With advances in the care and treatment of type 2 diabetes and its complications, people with diabetes can live with their condition for longer (Deshpande et al., 2008; Liu et al., 2010). It is important to detect the development of complications early enough, as rapid action can prevent or delay the onset of chronic complications (Marshall & Flyvbjerg, 2006). AI plays an important role in predicting complications using basic clinical and biochemical patient data, but predicting the occurrence of different complications is a challenging task due to different risk factors, unbalanced data and rapid changes (Singla et al., 2019). Therefore, there is an increasing emphasis on the use of appropriate AI techniques to predict prognosis (Singla et al., 2019; Yousefi & Tucker, 2020). Consequently, accurate prediction helps to target nursing interventions better (Ljubic et al., 2020). AI supports nurses in clinical decision-making and other tasks that are not directly related to the patient (Seibert et al., 2021).

FIGURE 1 Flow diagram for systematic reviews
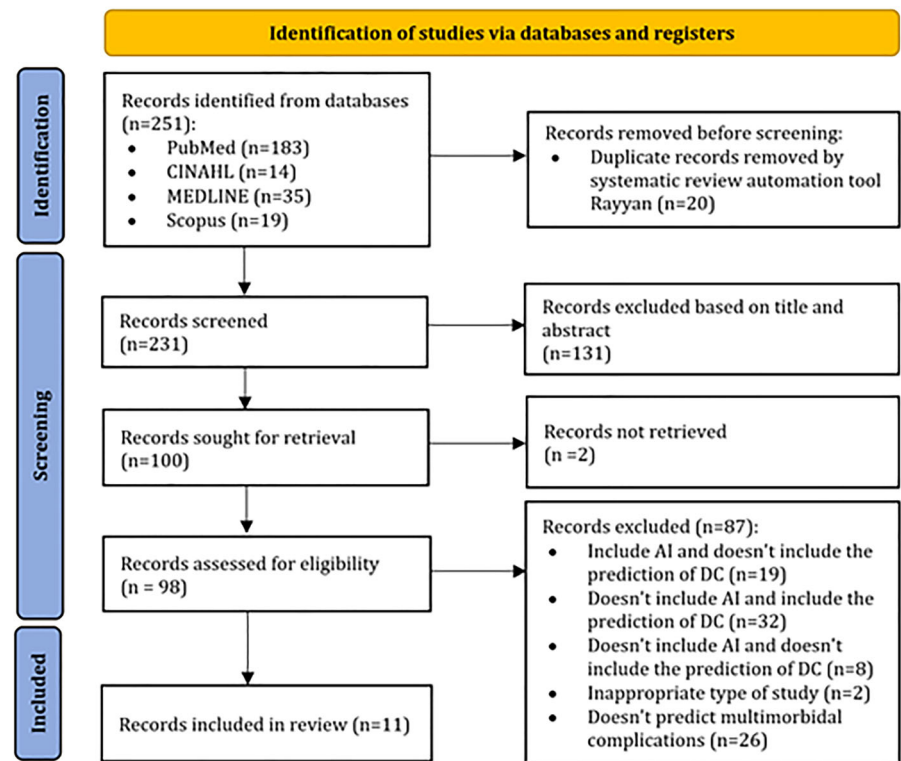
Legend: n=number of records.

FIGURE 2 The most commonly treated complications of diabetes
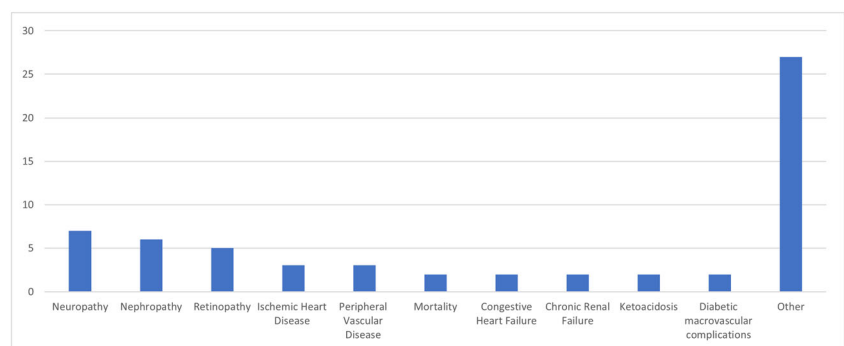
Nurses, as the largest part of all workers involved in health systems, will benefit enormously from AI (Shang, 2021). The role of nurses is to be actively involved in decision-making regarding the implementation of AI in the health care system and to ensure that they ensure that these changes are implemented in accordance with the ethical principles and values of nursing (Buchanan et al., 2020). With the introduction of technology, nurses' experience, knowledge and skills will be transformed into learning new ways of thinking and processing information (Robert, 2019). Our literature review also found that nurses are rarely involved in the interdisciplinary team that carries out the implementation. In most cases, it was individual research carried out by the researchers. It would be important to involve health care providers as they can influence the actual implementation of AI in clinical practice.

IT skills training should be offered to nursing students and those already working in a clinical setting (Risling, 2017). It is important that they understand the potential of AI and its impact on health care (Fritz & Dermody, 2019). It is also important that nurses are empowered by technological change and that they are not just passively involved in it (Ng et al., 2021).

In practice, there is still a lack of models or frameworks for implementing AI in everyday health care practices (Svedberg et al., 2022). Yet, there are individual gaps in the literature on AI in nursing, with implications for clinical practice (Shang, 2021). The content of research in the field is very diverse, so it is important to develop guidelines on research reporting and technology implementation (von Gerich et al., 2021). This is also the problem we encountered in our literature review, and it is also the biggest limitation. The included

research reported different methodological approaches and, above all, reported different results that cannot be synthesized due to inequalities. Despite the heterogeneity of the studies, most of them were based on data from patients diagnosed with diabetes, extracted from various electronic records. It is also very difficult to compare individual studies with each other, as they included a wide range of population sizes (minimum 129, maximum 287,438).

6 | CONCLUSIONS

New strategies are necessary to empower people worldwide to prevent and manage diabetes. Diabetes management requires constant monitoring and recommendations. AI provides multiple approaches for preventing and managing various chronic diseases, also as diabetes. The use of AI can predict risks of diabetes complications with greater precision based on available multidimensional datasets and provides a model for AI-assisted prognosis and diagnosis of next-generation diabetes complications.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

By using AI methods, we can help facilitate the control of diabetes and detect the presence of risk in patients for the development of multimorbid complications promptly. In this way, we contribute to a better quality of care, better autonomy of patients in the course of treatment of their disease and reduction of complications, costs of medical care and mortality. The use of AI methods also serves as a tool for nurses when working with patients, making it easier for them to predict disease progression and thus contributing better preventive care for patients.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

ETHICS STATEMENT
Ethical approval was not required as the research does not involve any participants and only involves a review of the literature.

AUTHOR CONTRIBUTIONS
Conceptualization: Lucija Gosak and Gregor Stiglic. *Data analysis:* Lucija Gosak, Gregor Stiglic, Mateja Lorber and Kristina Martinović. *Methodology:* Lucija Gosak, Gregor Stiglic, Mateja Lorber and Kristina Martinović. *Supervision:* Lucija Gosak and Gregor Stiglic. *Writing (original draft):* Lucija Gosak and Gregor Stiglic. *Writing (review):* Lucija Gosak, Gregor Stiglic, Mateja Lorber and Kristina Martinović. All authors have read and agreed to the published version of the manuscript.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available in the supporting information of this article.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

REVIEW ARTICLE

WILEY

Artificial intelligence for falls management in older adult care: A scoping review of nurses' role

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Abstract

Aim: This study aims to synthesize evidence on nurses' involvement in artificial intelligence research for managing falls in older adults.

Background: Artificial intelligence techniques are used to analyse health datasets to aid clinical decision making, patient care and service delivery but nurses' involvement in this area of research for managing falls in older adults remains unknown.

Evaluation: A scoping review was conducted. CINAHL, the Cochrane Library, Embase, MEDLI and PubMed were searched. Results were screened against inclusion criteria. Relevant data were extracted, and studies summarized using a descriptive approach.

Key Issues: The evidence shows many artificial intelligence techniques, particularly machine learning, are used to identify falls risk factors and build predictive models that could help prevent falls in older adults, with nurses leading and participating in this research.

Conclusion: Further rigorous experimental research is needed to determine the effectiveness of algorithms in predicting aspects of falls in older adults and how to implement artificial intelligence tools in gerontological nursing practice.

Implications for Nursing Management: Nurses should pursue interdisciplinary collaborations and educational opportunities in artificial intelligence, so they can actively contribute to research on falls management. Nurses should facilitate the collection of digital falls datasets to support this emerging research agenda and the care of older adults.

KEYWORDS
artificial intelligence, falls, machine learning, natural language processing, nursing

1 | INTRODUCTION

Falls are the second leading cause of unintentional injury-related mortality worldwide, after road traffic injuries. It is estimated that there are 37.3 million severe falls annually that require medical attention, of which 684,000 are fatal (World Health Organization, 2021). Falls can occur for many reasons. Biological factors include age, gender and physical health problems such as orthostatic hypotension, decreased visual acuity, impairments in gait, balance and cognition among others (Peltzer et al., 2013). Socio-economic risk factors associated with higher likelihood of a fall can encompass an individuals' educational level, while behavioural aspects can include actions such as consuming excessive amounts of alcohol or taking certain medications. Falls can also be attributed to environmental risk factors such as difficult stairs, poor lighting and slippery or uneven surfaces both indoors and outdoors (Jiang et al., 2019). While many falls are nonfatal, bruising and lacerations, head injuries and fractures can inhibit mobility and cause long-term physical and mental health issues (Ganz & Latham, 2020). Around 40% to 60% of falls lead to injuries, 30% to 50% of these being minor, 5% to 6% major (excluding fractures) and 5% fractures. Up to 1% of falls in older people result in a hip fracture. Injuries are the fifth most common cause of death in older people and falls are the most common cause of injury-related death in persons over 75 years (Kenny et al., 2012; World Health Organization, 2021). Furthermore, psychological complications, such as a fear of falling, can also compromise the independence of older adults, limit their daily activities and lead to a dependency on formal and informal care (Schoene et al., 2019).

Falls also impact the provision of health services. More than €25 billion is spent in falls related health care costs in the European Union each year, expenditure that is set to increase to approximately €45 billion by 2050 due to ageing populations across the continent (Turner et al., 2015). Furthermore, Hartholt et al. (2012) examined the spectrum of costs associated with falls in the Netherlands including family physician consultations, hospital stays and outpatient visits, long-term care and home care costs and found the mean cost per fall was €9370. This figure was higher for women (Bowen & Mason, 2012) than men (Waters et al., 2009) and increased with age, with patients 85 years and older who had fallen costing more than those aged 65–69 years. Similarly, in the United States, fall-related injuries result in 2.8 million emergency departments visits each year, along with 800,000 hospital stays (Bergen et al., 2016), costing up to $49.5 billion US dollars annually (Florence et al., 2018).

Managing falls can be addressed in a number of ways. Preventative strategies can involve removing hazards in home and hospital environments and providing assistive modifications (e.g., shower chairs or handrails), or reviewing footwear, medications, cognition and vision (Leung, 2021). However, early identification of at-risk individuals can be difficult, given that many factors can contribute to a fall particularly among older age groups. While a multidisciplinary approach is often adopted, nurses undertake a lot of the day-to-day work in falls prevention by gathering and interpreting fall-related paper-based and digital data (Johnson et al., 2011). The

use of technologies to detect and reduce falls like depth cameras, floor sensors and wearable devices with accelerometers is also increasing (Wang et al., 2020), while digital programmes, exergames and robots are being used to improve gait, balance, mobility and strength (Stanmore et al., 2019). Nurses are often involved in implementing these types of interventions with at-risk older adults in both hospital and community settings.

1.1 | Artificial intelligence (AI)

AI is an emerging technological trend that is being used in falls management and encompasses a range of advanced computational techniques. Although many definitions exist, a recent high-level expert group on AI described it as 'software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behaviour by analysing how the environment is affected by their previous actions' (Samoili et al., 2020). Contemporary forms of AI such as machine learning (e.g., supervised, unsupervised and reinforcement learning), natural language processing, fuzzy logic and expert systems among others are being developed and tested to help predict, prevent and detect falls (Ng et al., 2021). A recent systematic review of machine learning trends for fall detection and prevention found 33 studies, most of which used datasets from wearable and sensor devices and were tested on younger participants in controlled laboratory settings to build predictive models (Usmani et al., 2021). However, this review included only machine learning, excluding other AI domains and included studies from only three bibliographic databases (Google Scholar, IEEE Xplore and Science Direct), missing key sources of biomedical, health and nursing research. Additionally, nurses as a key professional group involved in falls management were not identified in the review and few clinical implications were presented. Furthermore, a number of reviews of AI in nursing encompass all areas of practice but do not report nurses' contribution to this specific area of research and detailed descriptions of falls related studies are missing (O'Connor et al., 2022; Seibert et al., 2021; von Gerich et al., 2022). Hence, a review that focuses on nurses' involvement in research on AI for falls management in older adults is warranted, to understand what advanced computational techniques are employed to try to improve falls management in older adult care, and how the nursing profession contributes to this area of research and practice.

2 | METHODS

The review aimed to identify and summarize studies on nurses' involvement in AI-based falls research and the potential impact these

advanced computational approaches may have on the care of older adults. The review was registered on the OSF Registries (https://www.cos.io/products/osf-registries) and the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist was followed (see Appendix S1).

2.1 | Search strategy and screening

Several scoping searches were undertaken to identify search terms relevant for AI, falls, older adults and nursing. Relevant MeSH terms, Emtree terms and subject headings were also added. The term 'logistic regression' was not included for pragmatic reasons due to the limited time and resources available to undertake the review, although some applications of this type of probability modelling are considered forms of AI (Beam & Kohane, 2018). Two separate searches were run across five bibliographic databases, that is, CINAHL (EBSCOhost), the Cochrane Library, Embase, MEDLINE (Ovid) and PubMed Central. The first, broad search was run on 10 November 2021 and encompassed terms for AI, falls management and older adults (e.g., 'aging', 'older adult*', 'artificial intelligence', 'machine learning', 'fall*' and 'accidental falls') to help identify pertinent literature that may involve nurses in its design or conduct (Appendix S2). Two thousand and twelve results were found and downloaded to Rayyan software (https://www.rayyan.ai/), with duplicates removed before screening. Studies were screened according to title, abstract and full text by two reviewers working independently. The second search was run on 5 February 2022 and focused specifically on nursing within the AI for falls management domain (Appendix S2). One hundred and thirty-seven results were returned which were subsequently screened by title, abstract and full text via Rayyan by two reviewers working independently (Figure 1). Consensus discussion helped resolve any disagreements during screening. Inclusion and exclusion criteria were developed using the Population, Intervention, Comparator, Outcome, Setting/Study and Timeframe framework (Table 1).

2.2 | Data extraction and analysis

Microsoft Excel was used to create a data extraction template that was adapted from the Cochrane Effective Practice and Organisation of Care Review Group data collection checklist. The data extracted from each study included the first author, year, country, research aims/objectives, study design, setting, data collection, participants, AI intervention and results/outcomes (Table 2). The included studies were summarized using a descriptive approach.

3 | RESULTS

Fourteen empirical studies were included, published between 2010 and 2021. Four were located in South Korea and four in Japan, with one study being conducted in Taiwan, Turkey, Ireland, France, Germany and the United States (Figure 2). The study designs were all quantitative in nature, using retrospective case–control or cohort designs, with some not explicitly reporting the methodology used. Nine studies employed secondary analysis on existing falls related datasets from electronic health records, chart reviews, clinical guidelines or published scientific literature, web-based reporting systems, national surveys or registry data (Cho et al., 2019, 2021; Jung et al., 2020; Lee et al., 2010, 2020; Nakanishi et al., 2021; Nakatani et al., 2020; Yang et al., 2021; Yokota et al., 2017). Four studies conducted primary research by collecting falls associated data via geriatric or clinical assessments of older adults, physical and mobility assessments using sensors to detect risk factors and self-reported questionnaires completed by older participants (Beauchet et al., 2018; Greene et al., 2014; Makino et al., 2021; Rabe et al., 2020). Only one study used a combination of primary and secondary falls data for analysis (Ağartıoğlu Kundakçi et al., 2020). The setting for the majority of included studies was a hospital clinic or hospital-based electronic medical record (EMR), with one taking place in a care home (Lee et al., 2020), and one in community centres (Makino et al., 2021).
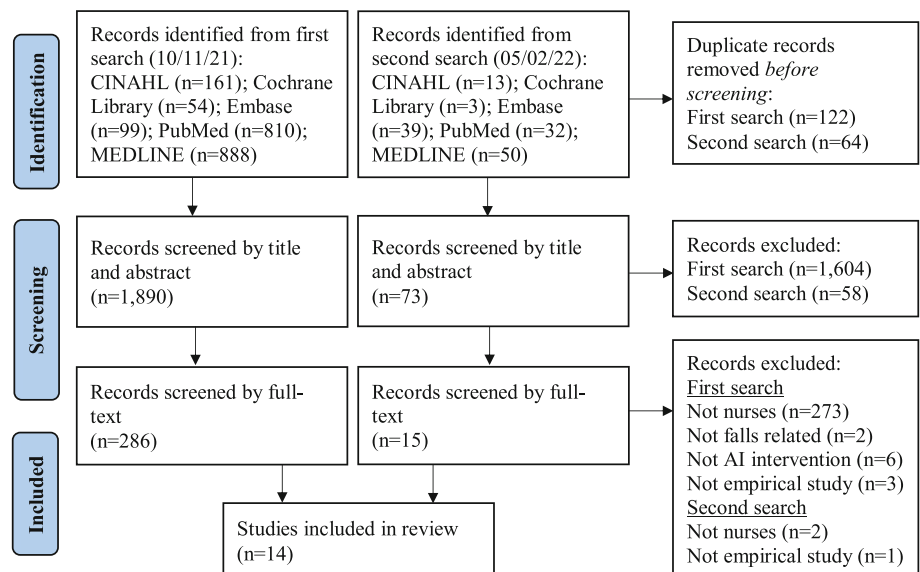
FIGURE 1 Flow diagram of the screening process

TABLE 1 Inclusion and exclusion criteria for the review

Inclusion criteria	Exclusion criteria
Population: Older adults (average age 60 years or more) and mixed populations if older adults comprised the majority of participants. Nurses also had to be involved in some aspect of the design or conduct of the research study, either as participants or members of the research team	Child and adults under 60 years of age
Intervention: Any artificial intelligence technique applied to an area of falls management	Artificial intelligence techniques or systems that were simulated, prototyped, not based on real-world datasets, or where no specific artificial intelligence methods were described
Comparison: No comparator was used	
Outcomes: All outcomes	None
Settings: All settings (acute, primary or community care, long-term/residential care)	None
Study design: All types of studies designs (quantitative, qualitative, mixed methods)	None
Timeframe: None, given the recent emergence of artificial intelligence in health care	
Publication type: Peer-reviewed articles in English language journals	Conference proceedings, dissertations and theses, discussion and editorial articles, grey literature and literature reviews

Another study used a population health survey dataset from non-institutionalized adults (Yang et al., 2021) and one included a variety of settings in primary care (Rabe et al., 2020) (Table 2).

3.1 | AI techniques for falls management in older adult care

All 14 studies utilized one or more supervised machine learning methods, predictive algorithms that build mathematical models from a training dataset that contains variables and outcomes of interest (Table 2). The algorithm 'learns' patterns and relationships within a dataset to predict an outcome, without being explicitly programmed (Beam & Kohane, 2018). Three studies employed a decision tree supervised learning method to calculate the cost of nursing interventions for preventing falls or classify risk factors to predict falls in the elderly (Ağartıoğlu Kundakçi et al., 2020; Makino et al., 2021; Nakanishi et al., 2021). Greene et al. (2014) and Yokota et al. (2017) employed a support vector machines model to screen and classify older adults for falls risk based on a comprehensive clinical dataset. Two studies used artificial neural networks to predict falls from 10 factors identified via structured data within a nursing incident reporting database, preselected from a set of 72 based on univariate correlation with occurrence of falls (Beauchet et al., 2018; Lee et al., 2010).

Two studies employed Bayesian networks, a graphical model that denotes probabilistic relationships between variables. Cho et al. (2019) extracted nursing notes and statements from a hospital EMR and chart reviews from units with high falls rates to help predict the risk of inpatient falls using a probabilistic Bayesian network model. In a follow-up study, this fall prediction analytical tool was integrated into a hospital EMR which generated a 24-h falls risk prediction for each patient and triggered an 'at-risk' alert on the system along with a care plan of falls interventions prioritized according to patients' individual risk factors (Cho et al., 2021). Four studies compared a range of machine learning techniques to determine their predictive performance for assessing falls risk among older people, with some comparing them against standardized falls risk assessment tools and two reported logistic regression had the highest predictive performance (Jung et al., 2020; Lee et al., 2020; Rabe et al., 2020; Yang et al., 2021). Finally, Nakatani et al. (2020) was the only study that used natural language processing in conjunction with a specially designed machine learning algorithm called Concept Encoder, employing morphological analysis to determine meaning in language, to help predict inpatient hospital falls from unstructured nursing records.

3.2 | Nurses' involvement in AI research for falls management

The level of nursing involvement in AI research to help manage falls in older adults varied. In eight studies, nurses were the lead researcher or lead author (Ağartıoğlu Kundakçi et al., 2020; Cho et al., 2019, 2021; Jung et al., 2020; Lee et al., 2010, 2020; Nakanishi et al., 2021; Yang et al., 2021), while four studies were led by other scientific disciplines including medicine, computer science, health economics and health information management. Two studies were directed by commercial companies, a pharmaceutical enterprise and a technology company that specialized in AI motion analysis. Only one study was co-led by two scientific faculty from both nursing and information science (Nakanishi et al., 2021) and two studies included nurses as part of the research team, where they participated in conceiving,

TABLE 2 Study characteristics

Author, year, country, lead	Research aim(s)	Study design, setting, data collection	Participants	AI techniques	Results/outcomes
Ağartıoğlu Kundakçı et al. (2020), Turkey, Lead author: nursing faculty	To examine the costs of falls in older people living in the community and the costs of fall prevention interventions implemented by nurses, using a decision tree model. To also determine the factors affecting the cost of falls.	*Study design:* costing and cost-effectiveness study. *Setting:* hospital, emergency department. *Data collection:* primary and secondary—data collection form on sociodemographic characteristics, 10-item questions on falls and three-item questions on costs of falls. Patient files were reviewed retrospectively via the Hospital Information Management System.	*Numbers:* 2075. *Type:* patients admitted to a hospital due to falls in the community. *Gender:* 65.16% were females. *Age:* mean age 76.77 ± 7.83. *Ethnicity:* not reported	Decision tree model used for economic evaluation (1-year Markov model cycle was applied). Sensitivity analysis was based on cost parameters and the costs were increased or reduced by 25%	The average cost for a person admitted to a hospital due to falls was $396.51 ± $1429.35. It was determined that costs varied according to the type of the injury. The total cost increased as the age increased ($r = .23$, $P < .001$). Three scenarios tested were costly but also more effective.
Beauchet et al. (2018), France, Lead author: medical faculty	To examine performance criteria for fall prediction using artificial neural networks (ANNs) analysis in older inpatients hospitalized in acute care medical wards.	*Study design:* quantitative—observational prospective cohort design. *Setting:* hospital—10 acute care medical wards. *Data collection:* primary—bedside clinical assessment within 24 h of admission including mobility and cognitive impairment to gather baseline data.	*Numbers:* 848 (training $n = 678$ and testing $n = 170$). *Type:* older inpatients. *Gender:* 41.8% female. *Age:* 83.0 ± 7.2 years. *Ethnicity:* not reported	Three feed forward ANNs, that is, multilayer perceptron, averaged neural network and neuroevolution of augmenting topologies	ANNs showed a high specificity (regardless of which was used) with the highest value reported was multilayer perceptron (99.8%). Sensitivity was lower, with values ranging between 98.4% and 14.8%. This combined artificial intelligence (AI) approach should be used more as a diagnostic test than a screening test when considering older inpatients in acute care.
Cho et al. (2019), South Korea, Lead author: nursing faculty	To assess if longitudinal electronic medical record (EMR) data could be utilized to calculate the risk of inpatient falls and assess their accuracy compared with existing fall-risk assessment tools.	*Study design:* retrospective study. *Setting:* Two tertiary hospitals with different EMR systems. *Data collection:* secondary—development cohort: 220 events from the event-reporting system and an additional 18 cases from chart reviews conducted after prefiltering the free-	*Numbers:* 14,307 (development) and 21,172 (validation). *Type:* hospitalized inpatients admitted to six nursing units. *Gender:* 43.03% and 52.90% female. *Age:* majority 65+ years. *Ethnicity:* not reported	Probabilistic Bayesian network model (standard nursing terminologies mapped to local EMR data elements to develop and validate the fall-risk prediction model)	Initial model had an error rate of 11.7% and a spherical payoff of 0.91, with a c-statistic of 0.96. This represents far superior performance compared with the existing fall-risk assessment tool (c-statistic = 0.69). The cross-site validation revealed an error rate of 4.87% and a spherical

(Continues)

TABLE 2 (Continued)

Author, year, country, lead	Research aim(s)	Study design, setting, data collection	Participants	AI techniques	Results/outcomes
		text entries validation cohort: 292 falls identified from the reporting system and chart reviews.			payoff of 0.96, with a c-statistic of 0.99. The calibration curves for the model displayed more reliable results than the fall-risk assessment tools alone. Nursing intervention data showed potential contributions to reducing the variance in the fall rate as did the risk factors of individual patients.
Cho et al. (2021), South Korea, Lead author: nursing faculty	To determine the impact of an electronic analytic tool (developed in Cho et al., 2019) for predicting fall risk on patient outcomes and nurses' responses.	*Study design:* Nonrandomized controlled trial using an interrupted time series design *Setting:* 12 medical-surgical nursing units at a public hospital *Data collection:* secondary—a fall prediction analytic tool was integrated into the EMR system and deployed in six nursing units with 204 nurses automatically receiving the prediction results on a daily basis.	*Numbers:* All nurses (n = 204), 24,336 (intervention) and 18,140 (control) older patients *Type:* inpatients *Gender:* 51.41% and 49.91% female *Age:* mean age 61.45 and 65.30 years *Ethnicity:* not reported	Analytic tool based on a probabilistic Bayesian network model (standard nursing terminologies mapped to local EMR data elements to develop and validate the fall-risk prediction model)	Number of patient falls differed between the control (n = 382) and intervention (n = 325) units. Mean fall rate increased from 1.95 to 2.11 in control units and decreased from 1.92 to 1.79 in intervention units. Immediate reduction was 29.73% in the intervention group ($z = -2.06$, $P = .039$) and 16.58% in the control group ($z = -1.28$, $P = .20$), but there was no ongoing effect. The injury rate did not differ significantly between the two groups. Analytic tool may help with awareness of falls risk, leading to positive changes in nurses' interventions over time.
Greene et al. (2014), Ireland, Lead author: computer science faculty	To examine the utility of a range of individual assessments with older adults to screen for frailty and falls risk in older adults.	*Study design:* quantitative —not explicitly reported *Setting:* clinic in a hospital *Data collection:* primary—geriatric and clinical assessments, falls history and a platform with inertial	*Numbers:* 124 *Type:* community-dwelling older adults *Gender:* 33 males and 91 females *Age:* at least 65 years old *Ethnicity:* not reported	Support vector machines (SVM)—separate models were generated to classify participants using features from each test separately and the combined features from all three tests	In classifying falls history, combining sensor data from the TUG, FTSS and quiet standing balance tests to a single classifier model per gender yielded mean cross validated classification

(Continues)

TABLE 2 (Continued)

Author, year, country, lead	Research aim(s)	Study design, setting, data collection	Participants	AI techniques	Results/outcomes
		and pressure sensors to quantify the balance and mobility of older adults using three physical assessments (timed up and go [TUG], five times sit to stand and quiet standing balance.			accuracy of 87.58% for the male model and 78.11% for the female model. The combination of the three tests, quantified using body-worn inertial sensors, could lead to better methods for assessing falls risk.
Jung et al. (2020), South Korea, Lead author: nursing	To develop fall-risk prediction models using EMR data and to evaluate the predictive performance of these models by comparing the results to those from the Hendrich II Fall Risk Model Validation (HIIFRM).	*Study design*: quantitative—not explicitly reported *Setting*: a tertiary acute care hospital *Data collection*: secondary— 165 features on falls risk extracted from clinical guidelines and existing literature. Data on fall-related features extracted from 10 EMR sources.	*Numbers*: 15,480 (fallers n = 310, nonfallers n = 15,170) *Type*: hospital inpatients *Gender*: 60% male in fallers and 53.7% in nonfallers *Age*: mean age 62.9 ± 14.7 in fallers *Ethnicity*: not reported	Logistic regression, Cox PH regression and decision tree algorithms used to develop fall prediction models	Logistic regression had the highest predictive performance, with the exception of area under the curve (AUC), the time-dependent sensitivity, specificity and positive predictive value of Cox PH regression were all slightly lower than those of the HIIFRM. The prediction performance of the decision tree was poorer. The models could be implemented in a clinical decision support system to automatically predict a patient's risk of falling.
Lee et al. (2010), Taiwan, Lead author: nursing faculty	To identify critical factors related to patient falls (outcome variable focused on injury or not after a fall event).	*Study design*: quantitative—not explicitly reported *Setting*: hospital—1000-bed medical centre employing about 800 nurses in southern Taiwan *Data collection*: secondary—72 fall-related variables extracted from a web-based incident reporting	*Numbers*: 725 *Type*: fall incidents *Gender*: male n = 437 (60.3%) *Age*: 66–93 years n = 309 (42.6%); 1–65 years n = 416 (51.4%) *Ethnicity*: not reported	ANN used to explore the relationship between the identified predictors and the outcome variables in constructing the model; multivariate stepwise logistic regression used to confirm impact of identified variables	The ANN model produced the following results: a receiver operating character (ROC) curve indicated 77% accuracy, the positive predictive value (PPV) was 68% and the negative predictive value (NPV) was 72%, while the multivariate stepwise logistic regression only identified three

TABLE 2 (Continued)

Author, year, country, lead	Research aim(s)	Study design, setting, data collection	Participants	AI techniques	Results/outcomes
		system developed by the nursing department.			variables (fall assessment, anti-psychosis medication and diuretics) as significant predictors with ROC curve of 42%, PPV of 26.24% and NPV of 87.12%.
Lee et al. (2020), South Korea, Lead author: nursing faculty	To compare six machine learning methods to identify predictive factors in resident falls in nursing homes.	*Study design*: quantitative—not explicitly reported *Setting*: care home—60 nursing homes across 17 provinces in South Korea *Data collection*: secondary—fall-related data based on chart reviews and participating organizations provided information on residents and staff related data via regular surveys in 2017.	*Numbers*: not reported *Type*: nursing home residents *Gender*: female mean 78.95% *Age*: mean age 83.6 years *Ethnicity*: not reported	Random forests (RF), logistic regression, support vector machines (SVM—linear, polynomial, radial and sigmoid)	Random forest was the most accurate model (0.883), followed by the logistic regression model, SVM linear and polynomial SVM (0.867). RF was a powerful algorithm to discern predictors of falls in nursing homes. For effective fall management, researchers should consider organizational characteristics and personal factors.
Makino et al. (2021), Japan, Lead author: medical faculty	To develop a simplified decision tree algorithm for fall prediction using easily measurable predictors with longitudinal cohort data.	*Study design*: longitudinal observational study *Setting*: community centres *Data collection*: primary— baseline survey of fall predictors and follow-up survey on recent falls, from a subcohort of a population-based national cohort. TUG was assessed in two trials by nurses and gait speed measured in five trials.	*Numbers*: 2520 *Type*: community-dwelling older adults *Gender*: 1303 female (51.7%) *Age*: 71.1 years (±4.7) *Ethnicity*: not reported	Decision tree analysis (C5.0 algorithm) to identify the optimal and minimum combination of risk factors necessary to predict the fall status of older adults	The decision tree model outperformed the logistic regression model with respect to AUC, accuracy, sensitivity, PPV and NPV. It consisted of common and easily measurable fall predictors, and the algorithm can explain the reasons for risk stratification; therefore, it can be implemented in clinical practice for early screening of fall risk and promotion of timely strategies for fall prevention.

(Continues)

TABLE 2 (Continued)

Author, year, country, lead	Research aim(s)	Study design, setting, data collection	Participants	AI techniques	Results/outcomes
Nakatani et al. (2020), Japan, Lead author: pharmaceutical company	To verify whether hospital inpatient falls can be predicted through unstructured nursing records obtained from EMRs using a natural language processing (NLP) and machine learning.	*Study design:* quantitative—case–control study. *Setting:* hospital—EMR of an acute hospital with 606 beds. *Data collection:* secondary—335 patients with one or more fall incidents (fallers) were identified from the incident reports of the hospital. As a control group, 408 patients without falls (nonfallers) were randomly selected.	*Numbers:* 743 (335 fallers, 408 nonfallers). *Type:* hospital inpatients. *Gender:* 156 (45.6%) female fallers and 186 (54.4%) female nonfallers. *Age:* 67.0 years (SD 17.1)	Algorithm for NLP and a machine learning tool called Concept Encoder (used morphological analysis)	The prediction of falls using the dataset showed high accuracy, with an area under the ROC curve, sensitivity, specificity and odds ratio of mean 0.834 (SD 0.005), mean 0.769 (SD 0.013), mean 0.785 (SD 0.020) and mean 12.27 (SD 1.11) for five independent experiments, respectively. NLP algorithm combined with machine learning can effectively extract risk factors for falls from nursing records.
Nakanishi et al. (2021), Japan, Lead authors: information science and nursing faculty	To construct and test an algorithm for a fall-risk assessment to identify essential risk factors for falls in hospitalized patients.	*Study design:* quantitative—not explicitly reported. *Setting:* hospital based. *Data collection:* secondary—data from an electronic medical chart system (36 fall-risk factors between nonfall and fall groups).	*Numbers:* Nonfall (*n* = 56,673) and fall (*n* = 238). *Gender:* male 52.7% nonfall and male 58.4% fall group. *Age:* median age 67.0 nonfall group and 71.5 years fall group. *Ethnicity:* not reported	Logistic regression used to identify important falls risk factors and decision tree analysis (on nine risk factors) used to classify the severity of falls risk (low, moderate, high, extra high)	Important risk factors were: (1) fall history, (2) muscle weakness of the lower limbs, (3) use of a walking aid, (4) stagger, (5) presence of infusion routes/tubes, (6) impaired judgement/comprehension, (7) impaired consciousness, (8) delirium, (9) use of sleeping drug, (10) urine or faecal incontinence, (11) need of toileting assistance and (12) night urination. The algorithm considered the correlation between fall-risk factors. Nurses may be able to evaluate falls risk level and provide preventive interventions for patients using this approach.

TABLE 2 (Continued)

Author, year, country, lead	Research aim(s)	Study design, setting, data collection	Participants	AI techniques	Results/outcomes
Rabe et al. (2020), Germany, Lead author: technology company	To study the discriminative ability of a falls risk score with the aid of machine learning models.	*Study design:* descriptive evaluation - retrospective analysis. *Setting:* not clear. *Data collection:* primary—falls risk assessment (smartphone-based video analysis with nursing staff capturing a senior person's gait) followed by a mobility test, a questionnaire assessing further falls risk factors via the app (self-assessments or completed with the help of nursing staff).	*Numbers:* 242 seniors. *Type:* 131 seniors (54.1%) were living in nursing homes, 34 (14.1%) in assisted living facilities and 77 (31.8%) at home. *Gender:* 169/242 participants (69.9%) were female. *Age:* mean age of 84.6 years. *Ethnicity:* not reported	Multiple learning models were used, that is, logistic regression, Gaussian naïve Bayes, gradient boosting, support vector classification, random forest	The performance metrics (AUC, sensitivity, specificity and accuracy) for the logistic regression model were 0.9, 100%, 52% and 73%; the Gaussian naïve Bayes models were 0.9, 100%, 52% and 73%; the gradient boosting model were 0.85, 88%, 62% and 73%; the support vector classification models were 0.84, 88%, 67% and 76%; and the random forests models were 0.84, 88%, 57% and 70%. The falls risk app could support caretakers to conduct a valid falls risk assessment.
Yang et al. (2021), USA, Lead author: nursing faculty	To determine if machine learning (ML) can predict falls based on data from community-dwelling older adults.	*Study design:* quantitative—retrospective cohort study. *Setting:* public health—the Behavioral Risk Factor Surveillance System (BRFSS), a national survey on noninstitutionalized adults on their health-related risk behaviours. *Data collection:* secondary—individuals older than 60 years who responded to BRFSS falls questions.	*Numbers:* 214,777 (training 75%, testing 25%). *Type:* community-dwelling older adults. *Gender:* female 61.2%, male 38.8%. *Age:* 70.27 (SD 6.76)	Random forests compared with logistic regression	Regarding fall prediction, the random forest classifier achieved 33% sensitivity, 41% positive predictive value and 37% F1-measure on the default threshold value of 50%, as compared with 70% sensitivity, 34% positive predictive value and 50% F1-measure on the decreased threshold value of 30%. This was statistically significantly worse in predicting falls, compared with logistic regression. Model performance was too low to be clinically useful.

(Continues)

TABLE 2 (Continued)

Author, year, country, lead	Research aim(s)	Study design, setting, data collection	Participants	AI techniques	Results/outcomes
Yokota et al. (2017), Japan, Lead author: health care information management faculty	To create a system to assist nurses in evaluating the fall risk of patients and to evaluate the fall risk of a certain day using the patient's status, attributes and location information on that previous day.	*Study design:* quantitative—not explicitly reported. *Setting:* hospital EMR. *Data collection:* secondary—intensity-of-nursing-care-needs data and patients' hospital admission or discharge movement data for general hospital wards, data on patients' characteristics and activities, data from admitting hospital ward and fall report data from an incident reporting system.	*Numbers:* 1950 cases of falls were identified (0.16%). *Type:* remaining 1,221,737 cases being nonfalls (99.84%). *Gender:* 51.5% males and 48.5% females. *Age:* average age of 62.4 years	Support vector machines model used for training the data (all features were used)	The model showed clear sensitivity and specificity toward unknown data and determined whether a patient will fall on the following day by using their status and other information on the current day. Using this model, nurses in charge may be able to determine the degree of fall risk objectively, without having to spend time gathering new information.

Note: AI, artificial intelligence; ANN, artificial neural network; AUC, area under the curve; BRFSS, Behavioral Risk Factor Surveillance System; CI, confidence interval; EMR, electronic medical record; FTSS, five times sit to stand; HIIFRM, Hendrich II Fall Risk Model Validation; ML, machine learning; NLP, natural language processing; NPV, negative predictive value; PPV, positive predictive value; RF, random forests; SD, standard deviation; SVM, support vector machines; ROC, receiver operating characteristic; TUG, timed up and go.

designing and conducting the experiments and writing the scientific manuscript (Beauchet et al., 2018; Yokota et al., 2017).

In four cases, nurses were actively involved in collecting the falls dataset used in the research. In Beauchet et al. (2018), nurses in a hospital undertook routine assessments with older inpatients covering medication, mobility, cognitive impairment, informal carer and social services, along with falls history and falls risk, as well as recording falls incidents. Similarly, in Greene et al. (2014), a comprehensive geriatric assessment was undertaken by nurses at a hospital clinic, which included visual acuity and visual contrast sensitivity tests, blood pressure and maximum grip strength measurements, balance and mobility tests using inertial sensors and an examination of frailty status. Nurses also assisted in Makino et al. (2021) by assessing falls in older persons via a baseline and follow-up survey, approximately 48 months later, while also investigating prescribed medications and medical history, and measuring gait speed and timed up and go. Lastly, nursing staff in Rabe et al. (2020) conducted a fall-risk assessment where mobility was captured via video and followed by an in-depth questionnaire completed via a smartphone application.

One study did not involve nurses directly but used secondary data from nursing records in an EMR which included patient statements, nursing observations and vital signs, nursing assessments, medical treatments, medication administration, patient messages and other comments from nurses were also used (Nakatani et al., 2020). Interestingly, Cho et al. (2021) was the only study where nurses in clinical practice used an AI-based system across six hospital units for real-world clinical validation. The AI-based fall prediction tool was trialled alongside a standardized falls risk assessment to determine which was more accurate in identifying older patients at risk of falling and to encourage nurses to implement falls prevention strategies, with the intervention group implementing more falls risk targeted interventions. While the other 13 studies utilized real falls related data to train and test predictive algorithms, these were not implemented in an AI-based tool/system that nurses could use to inform decision making and the delivery of older adult care.

4 | DISCUSSION

This review synthesized evidence on nurses' involvement in AI research for managing falls in older adults. It found that machine learning techniques were the most common method used, primarily to identify factors that could more accurately predict falls in older adults, and in some cases compared these to standardized falls risk assessment tools. The widespread use of machine learning in falls research has been reported (Usmani et al., 2021), although natural language processing, fuzzy logic, computer vision and other AI techniques are starting to be utilized more (O'Connor et al., 2022). Some research also suggests that logistic regression can perform just as well as machine learning for clinical prediction models (Christodoulou et al., 2019). Furthermore, the studies in this review noted some common limitations when using AI such as datasets with missing or incomplete falls related information, often from one source organization
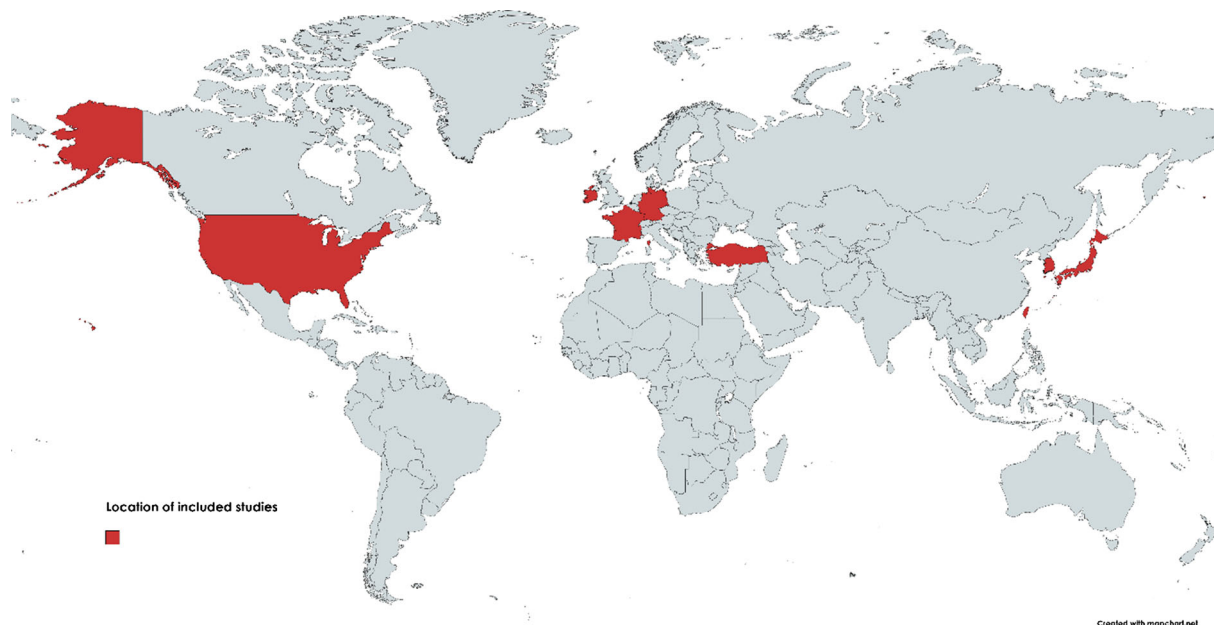
FIGURE 2   Location of included studies (using https://mapchart.net/)

within a particular geographic region and short timeframe, which could impact the quality of predictive models. These issues have been widely reported in AI literature (Bates et al., 2021). Hence, AI approaches used in managing falls in older adults needs further exploration, alongside developing longitudinal datasets that are as comprehensive as possible, to help build robust predictive models with clinical utility.

This review also highlighted that most studies only reported the potential of AI to improve falls prediction, with only a single study deploying an AI analytical tool with nurses in a hospital to help identify at-risk older adults. Many studies have taken a similar approach to developing algorithms (Bargiotas et al., 2021; Usmani et al., 2021), without moving beyond assessing their predictive performance to examine if and how they could fit into care pathways and be interpreted by clinicians to inform decision making and the care delivery. Furthermore, no study in the review examined how AI could be utilized to identify and support an older person who experienced a fall, through the use of physiological or environmental sensors or other integrated systems such as smart homes. There is a growing literature in the engineering and computer science fields addressing this (Bet et al., 2019) which nurses should be cognisant of and become involved in.

The review findings also emphasized that nurses are leading some AI research for falls management in older adults but other professions such as medicine, computer science and engineering are also active in this field, and multidisciplinary collaborations are common, which is mirrored by other reviews of AI in nursing (Ng et al., 2021; O'Connor et al., 2022; von Gerich et al., 2022). Ronquillo et al. (2021) recommend nurses become more active in AI initiatives in health care to ensure these approaches are developed and applied appropriately,

with practical and clinical utility in mind. Education and training may be required to upskill nurses in areas of informatics such as AI (Booth et al., 2021), so they can participate and lead this type of research, facilitate the collection of falls related digital datasets and use AI-based technologies in their practice to enhance older adult care.

4.1 | Strengths and limitations

The review was strengthened by using an open access platform to register the planned research, employing a rigorous database search, screening studies using independent reviewers and utilizing international best practice guidelines to improve the transparency and reporting of the review. However, as the search terms focused on the nursing profession specifically, other literature from computer science, engineering and related fields that are developing and testing AI techniques for falls management were not included. In addition, alternative sources of scientific studies such as conference proceedings, theses, pre-print and discursive articles were not included which may limit the comprehensiveness and utility of the review findings somewhat. Critical appraisal of the included studies was not conducted, so the methodological quality and the overall weight of evidence in this area remain largely unknown. Therefore, the results of the review should be interpreted with caution.

5 | CONCLUSION

As ageing societies become commonplace, the risk of and impact from falls among older adults will continue to grow, making AI research on falls management an important area that the nursing profession

should contribute to. This review highlighted how nurses have participated to date in is emerging research area, along with the potential that AI techniques have in identifying relevant risk factors and building predictive models that could be used by nurses to manage falls among older people. While the evidence base is preliminary, there are some early indications that developing and testing AI could lead to more robust predictive analytical systems that support improvements in gerontological nursing practice and patient care.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

Several key implications emerged from the review findings. First, more rigorous experimental research is needed to determine how effective AI techniques are in predicting aspects of falls in older adults and the impact these models have on nurses' decision making and the delivery of personalized care. More implementation science that examines how to deploy AI-based technologies with nurses who care for older adults across a range of acute and primary care settings could facilitate a better understanding of whether these predictive tools have practical and clinical utility in assessing and managing falls. Second, nurses should pursue interdisciplinary collaborations in AI research for managing falls to harness a range of expertise, ensuring a holistic approach to supporting older people is taken. Third, educational opportunities should be created for nurses to learn about machine learning, natural language processing and AI more generally, so the profession has knowledge and skills to participate and lead AI research that facilitates older adult care. Fourthly, more digital datasets of falls risk factors or conditions that lead to an actual fall in ageing populations could be created to support future AI research. This would help ensure algorithms being developed and tested have rich data from which to build predictive models that accurately reflect the real life of older adults, enabling nurses to improve the management of falls in this key patient group.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

ETHICAL STATEMENT
Ethical approval was not required for this work, as it is a review of the literature and involved no collection or analysis of primary data.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

ORIGINAL ARTICLE

WILEY

Nurse leaders' and digital service developers' perceptions of the future role of artificial intelligence in specialized medical care: An interview study

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Abstract

Aim: To describe nurse leaders' and digital service developers' perceptions of the future role of artificial intelligence (AI) in specialized medical care.

Background: Use of AI has rapidly increased in health care. However, nurse leaders' and developers' perceptions of AI and its future in specialized medical care remain under-researched.

Method: Descriptive qualitative methodology was applied. Data were collected through six focus groups, and interviews with nurse leaders ($n = 20$) and digital service developers ($n = 10$) conducted remotely in 2021 at a university hospital in Finland. The data were subjected to inductive content analysis.

Results: The data yielded 25 sub-categories, 10 categories and three main categories of participants' perceptions. The main categories were designated AI transforming: work, care and services and organizations.

Conclusions: According to our respondents, AI will have a significant future role in specialized medical care, but it will likely reinforce, rather than replace, clinicians or traditional care. They also believe that it may have several positive consequences for clinicians' and leaders' work as well as for organizations and patients.

Implications for nursing management: Nurse leaders should be familiar with the potential of AI, but also aware of risks. Such leaders may provide betters support for development of AI-based health services that improve clinicians' workflows.

KEYWORDS
artificial intelligence, content analysis, digitalization, interview, nurse manager, specialized medical care

1 | INTRODUCTION

Artificial intelligence (AI) is a term coined by McCarthy (1956) who defined it as 'the science and engineering of making intelligent machines, especially intelligent computer programs'. Strictly, this refers to the discipline of AI rather than AI per se, which generally refers to a collection of technologies that mimic (or surpass) key human intellectual functions (Davenport & Kalakota, 2019). It has been seen as an answer to some of the challenges confronting today's health care sector. For example, AI-based solutions for checking

COVID-19 symptoms have been developed (Scott & Coiera, 2020). Additionally, due to rapid digitalization of health care, an enormous and continuously expanding volume of patient data can only be dealt with by AI-based processing. Thus, AI already seems to play indispensable roles in our health care systems, and its significance will surely increase.

Inter alia, AI systems already have excellent pattern recognition capacities (Kim et al., 2019). Such abilities are rooted in 'machine learning' programmes that process input data by applying algorithms that iteratively seek patterns, check matches of their outputs to test datasets and refine their parameters, thereby validating the system (Haenlein & Kaplan, 2019). Most AI technologies, such as machine learning and deep learning, already have immediate relevance in health care (Davenport & Kalakota, 2019; Kim et al., 2019). From a health care perspective, AI brings a 'paradigm shift to healthcare, powered by increasing availability of healthcare data and rapid processes of analytic techniques' (Jiang et al., 2017).

AI has already been used to enhance clinical decision-making (Diprose et al., 2020) and has been seen as potentially transformative (Sarwar et al., 2019). In addition, there are increasing numbers of patient engagement and adherence applications, and AI has already been applied in some administrative processes (Davenport & Kalakota, 2019). However, its implementation raises complex ethical, legal, clinical and safety issues because of a lack of understanding of how AI models generate their outputs (Scott et al., 2021)—commonly known as 'the black box problem' (Neri et al., 2020).

AI technologies are changing the nursing profession (Ronquillo et al., 2021), and nurse leaders need to be visionaries (Ahonen et al., 2016) who deeply consider the future of nursing, including the implications of AI. However, various health care professionals, particularly clinicians, reportedly have mixed attitudes towards AI (Abdullah & Fakieh, 2020), and it has been claimed that they understand neither how AI uses algorithms nor the inner workings of algorithms (Romero-Brufau et al., 2020). This lack of knowledge may increase anxiety and arouse conflicting emotions in clinical staff (Abdullah & Fakieh, 2020), which may affect their perceptions of AI.

The ability of leaders to envision a better future strengthens the possibility of successfully addressing the challenges confronting health care (Malloch & Melnyk, 2013). Hence, nurse leaders need to foster positive attitudes towards AI technologies (Ronquillo et al., 2021), and to assist AI's beneficial deployment in future health care there are clear needs to understand nurse leaders' and developers' current perceptions of AI. This would provide insights into how AI could be developed to best serve health care organizations, clinicians' workflows and patient care. Such insights would be highly valuable for developers of AI, health care organizations and decision-makers seeking to develop and implement effective AI-based solutions. Therefore, the aim of the study presented here was to elicit nurse leaders' and digital service developers' perceptions of the future role of AI in specialized medical care. The specific research question posed was, What kind of perceptions do nurse leaders and digital service developers have of the future role of AI?

2 | METHODS

2.1 | Design and setting

We designed a descriptive qualitative study to describe Finnish nurse leaders' and digital service developers' perspectives on the future role of AI in specialized medical care (Polit & Beck, 2017). A qualitative design was chosen since it is suitable for exploring phenomena that are poorly and incompletely understood (Polit & Beck, 2017). The interviews were conducted in a Finnish university hospital with 828 hospital beds and 7117 personnel (Figure 1). We focused on staff working in specialized medical care units at this hospital partly because it is a pioneer in the development and implementation of digital health services, such as digital pathways, Virtual Hospital systems, digital Health Village platforms, remote clinics, robotics and other innovative technological solutions. During all relevant stages of the study, we followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong et al., 2007).

2.2 | Participants and recruitment

The participants were frontline nurse leaders (head nurses and assistant head nurses), middle managers ($n = 20$) and digital service
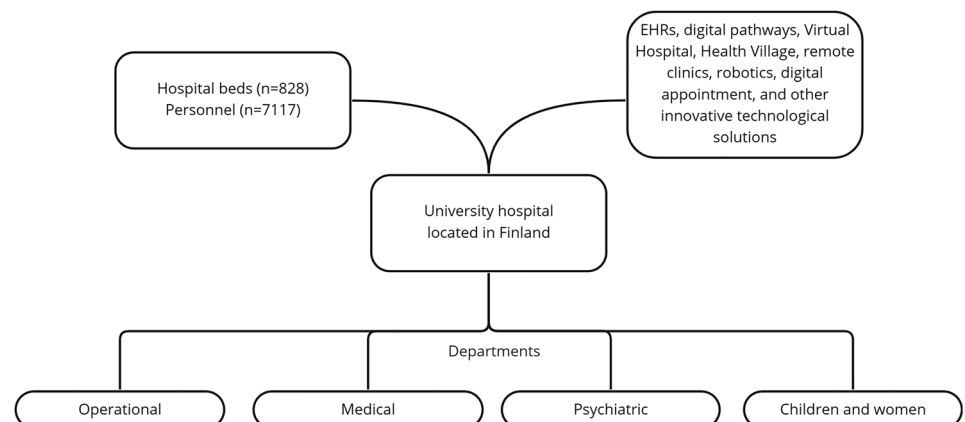
FIGURE 1 Description of university hospital (research organization)

developers (n = 10) working in specialized medical care in operational, medical, psychiatric, children and women departments and group services at the university hospital. The digital service developers were professionals in either health care or information technology and worked full-time or part-time on tasks or projects related to the development of digital services in specialized medical care. Both the nurse leaders and digital service developers were employed by the hospital. Eligible interviewees had to have experience of digital health services (e.g., electronic health records and/or patient portals), and understand current roles of digital services and digitalization in the organization's operations and strategy.

We used two recruiting strategies, depending on how hospital departments wished us to recruit interviewees. Initially, purposive sampling was used to acquire rich data (Polit & Beck, 2017). Two out of four departments gave us a list of five persons to contact concerning the focus groups. Two other departments gave us a list of nursing directors, head nurses and assistant head nurses. We sent emails to all of the named staff (n = 140) and recruited 22 interviewees. However, only 20 participated in group interviews due to scheduling difficulties. The nursing director gave us five names of digital service developers to contact, then a snowball sampling approach was employed to recruit digital service developers (n = 10) (Polit & Beck, 2017).

2.3 | Data collection and materials

A semi-structured interview guide, covering four common themes (competence, leadership, work wellbeing and AI), was developed by

TABLE 1 The semi-structured interview guide

Interview questions
What do you think about the role of AI in health care in the future?
How do you think AI will affect now and in the future?
Assisting questions:
1. Work in health care: Including your own work, and work of professionals generally?
2. Services: Patient and customer work?
3. Organizations: In terms of productivity, effectiveness, quality, safety and human or patient-centeredness?

the research team, including three experienced qualitative researchers, and content experts on nursing, digitization and leadership in health care. Use of the semi-structured interview guide fostered the emergence of relevant content from participants (Polit & Beck, 2017). Questions on the AI theme were based on earlier research (Abdullah & Fakieh, 2020; Yu et al., 2018) and included one on the future role of AI in specialized medical care.

The guide (Table 1) was pretested in a focus group with four leaders and individual interviews with two digital service developers. We asked these participants to evaluate the understandability and relevance of the interview guide, and we subjectively assessed the suitability of the duration of the sessions, group size, and group dynamics. The interviewees stated that the questions were understandable.

Data were collected by two researchers (EL, AY) from the focus groups and one researcher (MH, AY) from the individual interviews between July and November 2021 using Microsoft Teams. Six focus groups interviews were conducted, in each cause with three or four group members (Table 2). According to relevant methodological literature, numbers of both the interviewees and focus groups were appropriate (Tong et al., 2007). The groups were formed so that frontline leaders and middle managers were interviewed separately. Background information on the participants was collected by a Webropol survey (Table 3). Saturating data were obtained from both the focus groups and individual interviews (Kyngäs et al., 2020).

With the participants' permission, the interviews were audio-recorded using Microsoft Teams then transcribed verbatim, with tape recording as a back-up. The duration of the focus group interviews ranged from 73 to 106 min, and individual interviews from 36 to 72 min (total duration 1011 min). The transcripts comprised 333 pages of 12-point Calibri (body) font with 1.15 line spacing.

2.4 | Ethical considerations

No formal ethical approval was required according to the hospital's Research Ethics Committee, since the interviews did not concern patients, minors or anyone with any category of physical or mental exemption from the ability to provide informed consent (World Medical Association Declaration of Helsinki, 2013). However,

TABLE 2 Description of the focus groups

Group	Number of participants	Work task (current)	Age (years) mean (range)	Work experience (years) in leader position mean (range)
G1	4	Head nurses	51.5 (44.0–61.0)	11.0 (6.0–21.2)
G2	4	Head nurses	49.0 (44.0–55.0)	9.5 (5.0–14.0)
G3	3	Two assistant head nurses and one head nurse	50.3 (43.0–55.0)	10.0 (7.1–15.0)
G4	3	Assistant head nurses	46.0 (39.0–57.0)	6.3 (1.8–12.0)
G5	3	Assistant head nurses	52.0 (43.0–60.0)	4.9 (3.8–7.0)
G6	3	Nurse middle managers	59.0 (56.0–61.0)	19.2 (16.6–22.0)

TABLE 3 Nurse leaders' and digital service developers' demographics

Variable	Leaders (n = 20) F	Developers (n = 10) F
Gender		
Female	20	8
Male	–	2
Educational level		
Master's university degree or higher	11	4
Bachelor's degree or lower	9	6
Field of education		
Nursing/health care	20	7
Information technology	–	3
Work task (current)		
Head nurse	9	–
Assistant head nurse	8	–
Nurse middle manager	3	–
Project/expert work	–	6
Planner/designer	–	4
	Mean	Mean
Age (years)	51.2[a]	42.4[b]
Work experience (years)		
In current work[b]	6.3[c]	2.9[d]
In leader position in health care[c]	10.2[e]	
In health care[d]		18.9[f]

[a]SD: 7.1; min–max: 39.0–61.0.
[b]SD: 5.6; min–max: 34.0–49.0.
[c]SD: 4.5; min–max: 0.8–21.2.
[d]SD: 2.5; min–max: 0.6–8.2.
[e]SD: 6.0; min–max: 1.8–22.0.
[f]SD: 5.3; min–max: 9.0–25.0.

research permission was granted, and the participating organization considered ethical aspects of the study. Before the interviews, participants received written and spoken information concerning the study and researchers, and data protection notification. Written consent was then obtained from each participant electronically.

2.5 | Data analysis

The data were subjected to inductive content analysis, because it provides a systematic and objective means of describing poorly understood phenomena (Kyngäs et al., 2020). For this, NVivo software version 1.5 (QSR International Pty Ltd) was used. In addition to the transcripts, demographic data were obtained and are reported using descriptive statistics.

Two researchers (EL, MH) initially conducted the data analysis, and after forming the main categories they conferred with the third researcher (OK). All phases of content analysis were first done independently, and after each phase, the two researchers discussed the analytical process. The two researchers first read the data repeatedly, seeking insights. Secondly, they coded it using words or statements that related to the same central meaning as analysis units (Kyngäs et al., 2020). The original expressions were reduced to convert them into codes (n = 136). Thirdly, the codes were grouped into sub-categories based on similarities/differences, then the sub-categories were named according to their content. The categories were created through interpretation by identifying associated sub-categories. The main categories were formed by combining categories. Finally, the third researcher was consulted, the researchers reached consensus regarding the categories' content, and assigned names to the categories.

2.6 | Rigour

The trustworthiness of qualitative research depends on its credibility, dependability, confirmability, authenticity and transferability (Kyngäs et al., 2020; Lincoln & Guba, 1985). We sought to maximize the credibility of our work, within time and resource constraints, by selecting appropriate interviewees and ensuring that the data were saturated. The inductive content analysis procedure described above, involving two researchers initially conducting the independently then the third researcher commenting on the categories and comparing them to original data, was designed to strengthen dependability. To improve confirmability, the third researcher checked, as far as possible, that the findings were solely shaped by the collected data rather than researcher bias. To enable readers to judge the findings' transferability, we have provided relevant contextual information about the study setting and participants. In efforts to ensure authenticity we have included citations illustrating the connection between the findings and data (Kyngäs et al., 2020).

3 | RESULTS

Analysis of the data revealed three main categories of content regarding nurse leaders' and digital service developers' perceptions of the future role of AI in specialized medical care. These are AI transforming: (1) work, (2) care and services and (3) organizations (Figure 2). These main categories included 10 categories, which included 25 sub-categories (Table 4).

3.1 | Transforming work

The participating nurse leaders and developers expressed beliefs that AI will transform work in specialized medical care, free up clinicians' time and thus enable more interaction with patients. They also suggested that AI would perform more patient recording and routine work, leaving clinicians more time to focus on other demanding tasks currently beyond AI.
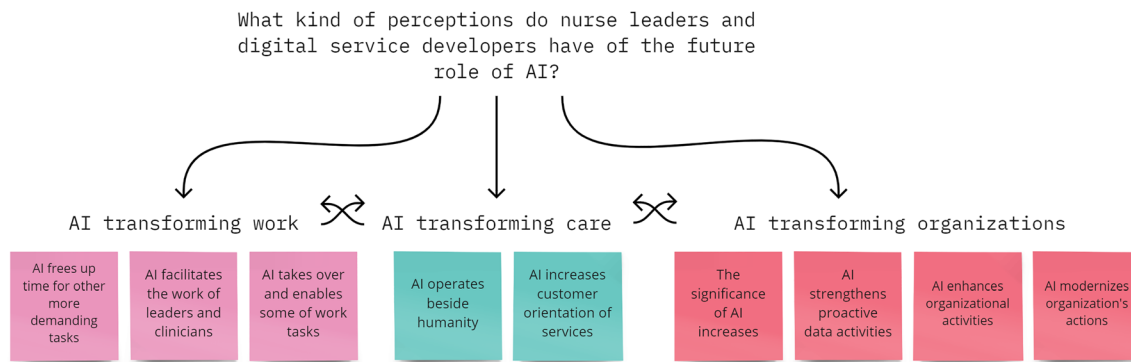
FIGURE 2 Nurse leaders' and digital service developers' perceptions of the future role of artificial intelligence (AI)

TABLE 4 Sub-categories, categories and main categories created using inductive content analysis

Sub-category (n = 25)	Category (n = 10)	Main category (n = 3)
AI can enhance clinicians' interactions with patients	AI frees up time for other more demanding tasks	AI transforming work
AI frees up clinicians' time		
AI supports leaders and clinicians	AI facilitates the work of leaders and clinicians	
AI makes clinicians' work easier		
AI can distribute medicines	AI takes over and enables some work tasks	
AI takes over routine work		
AI replaces some work tasks		
AI increases the need for IT clinicians		
AI transforms and enables tasks		
AI will not replace interaction	AI operates beside humanity	AI transforming care and services
AI will not replace all traditional services		
AI will not replace humans in future		
AI improves patient safety	AI increases customer orientation of services	
AI increases patients' active role in their care		
AI enhances personalized care		
AI enhances services and their availability		
AI's role will increase in future	AI's significance will increase	AI transforming organizations
AI will have a significant and major role in the future		
AI enables more efficient data management	AI strengthens proactive data management	
AI foresees the future		
AI saves resources	AI enhances organizational activities	
AI increases productivity		
AI increases efficiency		
AI changes organization's image	AI modernizes organization's actions	
AI shapes interactions in an organization		

'Patients can interact with AI on specific issues and seek advice leaving nurses time to perform other tasks …' Assistant head nurse/Group 5

Interviewees also expressed perceptions that AI could support leaders and clinicians in their work, inter alia by providing management tools for leaders. According to interviewees, AI will become a co-worker, performing work tasks, advising, anticipating actions and enhancing work by reducing human error and complementing human intelligence and memory. The results indicate a general belief among the sampled clinical staff that AI can facilitate clinicians' work by taking over routine tasks (e.g., distribution of medicines and dosing) and assisting with patient care (e.g., in diagnoses and examinations).

'… artificial intelligence would be a complement, its memory capacity does not depend on the time of day or state of mind, so it complements it [the human mind] …' Head nurse/Group 3

The results show that, according to our participants, AI will transform work by increasing, replacing and enabling tasks. For example, the number of IT professionals (who understand how AI works and affects information security) will grow with the use of AI. On the other hand, AI may decrease the work of employees such as frontline leaders or secretaries by taking over some of their duties (e.g., patient registration). The interviewees also perceived that AI could have positive effects by enabling new ways of working, potentially increasing patient contact through technology, and certainly introducing new training requirements.

'You have to be an expert in its field to even understand what artificial intelligence can do and what possibly to do with it …' Developer 7

3.2 | Transforming care and services

According to the participating leaders and developers, AI will transform medical care and services by operating beside humanity. They do not believe that AI will not replace clinicians since they make the ultimate decisions concerning patient care, and AI cannot replace encounters with real humans (AI cannot replicate—or is not suitable for—human-based interaction). In short, they did not perceive that AI will be able to replace traditional care.

'I think AI cannot replace clinicians, it is still supplementary, because humans are still needed for interpretation'. Assistant head nurse/Group 4

The interviewees expressed perceptions that AI increases the customer orientation of services, thereby enhancing patient safety, patients' inputs in their own care, personalized care and services and their availability. It increases patient safety by decreasing the subjectivity of clinicians' interpretations, for example, when making diagnoses, and robotics may enable more precise and less invasive surgeries. It may also enable patients to become more active, for instance, ordering food automatically or staying home with the assistance of AI. AI may enable more personalized services and support preventive care. AI may also enhance services and their availability. For example, AI solutions can be used in care pathways to collect anamneses or conduct interviews. AI may also facilitate provision of services who live in remote areas.

'… because we have robots … our surgeries can be more conservative and careful for patients …' Nurse middle manager/Group 6

3.3 | Transforming organizations

The interviewees expressed perceptions that AI is transforming organizations that provide specialized medical care and that its significance in specialized medical care will increase.

'I believe that it [the role of AI] will increase once we give it a chance and sufficient resources to develop it'. Developer 3

Most leaders expressed perceptions that AI would strengthen proactive data management, for example by forecasting the kinds and numbers of patients to be expected during different months of the year.

'Well now they are planning a program … that would collect data and enable forecasting of what kinds of patients may be expected during different months of the year'. Assistant head nurse/Group 5

The analysis also showed that participants felt that AI would enhance organizational activities, save resources and potentially increase productivity, as a much-needed supplement.

'… it [AI] is a much needed supplement that assists with resource savings and enhances efficiency …' Developer 1

Finally, according to our interviewees, AI will modernize organizations' actions by changing their images and shaping internal interactions, revolutionizing organizations and their brands by making them essentially high-tech. They also believed that interactions within organizations will become increasingly networked as AI enables different modes of communication.

'AI and digitalization affect the organization's brand, so people have an image of a high-tech organization'. Nurse middle manager/Group 6

4 | DISCUSSION

We identified three main categories of content concerning nurse leaders' and digital service developers' perceptions of the future role of AI in specialized medical care: AI transforming (1) work, (2) care and services and (3) organizations. Grasping their perceptions is important for understanding the direction in which AI should be developed in specialized medical care. Our results indicate that AI may have advantages for several domains of health care, for example, patient care and both clinicians' and leaders' work. This knowledge can be utilized by developers or decision-makers when developing or implementing new AI-based solutions for specialized medical care. In addition, nurse

leaders may utilize the findings when designing AI strategies for their organizations and developing their own AI-related skills. Our results indicate that AI will affect organizations' brands by making them appear 'high-tech' to people, which may be advantageous from a customer or employee perspective. High-tech organizations may, for example, lure potential employees who believe that AI improves their workflows and makes work more diverse.

Although it has been suggested that AI will replace clinicians in future (Shameer et al., 2018), based on our results and earlier study this seems unlikely. In our study leaders and developers were unanimous that AI will not replace clinicians, but rather be a supportive tool and replace only routine tasks. Although it is very unlikely that AI systems will replace clinicians, then, clinicians, leaders and developers should still learn to utilize AI; indeed, Davenport and Kalakota (2019) conclude that the only clinicians who will lose their jobs because of AI are those who refuse to work alongside it. It has also been suggested that clinicians require some understanding of how AI works and how they can assess the clinical worth of its suggestions (Scott et al., 2021). Thus, we suggest that clinicians, leaders, and developers should be educated to understand and utilize AI. They should, for instance, be able to validate the so-called black box, that is, how AI makes decisions. For leaders, understanding AI is required since they are responsible for designing organizations' AI strategies (Chen & Decary, 2020).Our results indicate that AI's role in the future will be as an assistant rather than an independent agent. This implies that AI will not be making decisions—clinicians will always be responsible for ultimate decision-making or diagnoses. Earlier literature has also highlighted the clinician's primary role in diagnosis that may be AI-assisted (Neri et al., 2020). Although AI enhances decision making, physicians want to understand how machine learning processes data so they can judge the trustworthiness of suggestions provided by AI (Diprose et al., 2020). According to our results, AI will facilitate and transform clinicians' work by freeing up time for patient care and transforming tasks by taking over routine work, and may provide assistance and support for clinicians in patient care. For example, the COVID-19 pandemic markedly increased health care professionals' workloads, but some AI, such as applications developed for early COVID-19 diagnosis, eased some of the increase (Vaishya et al., 2020). Earlier research supports our findings that AI enhances workflows and creates new roles and tasks in nursing (Buchanan et al., 2020). AI may allow more time to build relationships with patients by improving decision-making and patient recording (Chen & Decary, 2020). In addition, robots may reduce physical workloads in patient care by assisting efforts to meet basic hygiene and care needs (Archibald & Barnard, 2018). However, there is concern that use of robots in care may affect the clinician-patient relationship (Moyle et al., 2019), so AI should be used to enhance care rather than replace clinicians (Buchanan et al., 2020). To conclude, our results seem to be consistent with a conclusion by Chen and Decary (2020), that humans and machines have unique strengths and weaknesses, so instead of one replacing the other, they are more likely to complement each other in the optimization and provision of health care.

Our results suggest that AI will not replace traditional care and services, but it will probably increase the orientation of services towards the customer, for example by improving patient safety and enhancing personalized care. Accordingly, a previous study concluded that AI will most likely improve patient experiences, for instance by helping the identification of high-risk population groups and assistance with health monitoring (Chen & Decary, 2020).The significance of AI seems certain to increase in future, partly because its implementation has been set as a strategic goal by organizations such as the European Commission (European Commission, 2020). The rapid development of AI also supports our finding (Yu et al., 2018). One reason to utilize more AI is the increasing amount of patient data (Chen & Decary, 2020). Nurse leaders have certainly recognized AI's potential in analysing 'big data', and they expect AI to strengthen proactive data management.

4.1 | Limitations

Since all our participants worked in specialized medical care units, and most were females, the results might not be transferable to other organizations. The predominance of females in our participants can be explained by the gender distribution in the hospital: of the 140 recruited leaders only nine were male. Also, this is a single-centre study—all the participants worked in one university hospital in Finland. Therefore, the results may not be transferable to other hospitals or countries. In addition, the transcripts were not returned to participants to comment on them or confirm their authenticity. However, during the interviews, all the participants confirmed their statements by affirming that they had nothing to add, suggesting that they had given detailed information. Finally, qualitative interview studies are inevitably subject to social desirability bias.

5 | CONCLUSIONS

Our findings suggest that AI will have a significant role in specialized medical care. However, it will not replace clinicians or traditional services, but more likely reinforce them. Leaders and developers believe that AI-assisted specialized medical care will have several positive consequences for work, services, and organizations. AI is still novel in health care, and there is a need to research it from different perspectives and its roles in different contexts (e.g., primary care). For example, further research from the perspective of clinicians could examine whether their experiences with AI are similar to those of leaders and developers. The experiences of patients should also be examined to develop AI-based solutions that support services, care and truly meaningful solutions for patients.

5.1 | Implications for nursing management

It seems inevitable that AI will plant important roles in nurse leaders' work in the future. Thus, as stated by Chen and Decary (2020), it is

crucial for leaders to understand the state of AI technologies and the ways they may be used to improve service efficiency, access, and safety. Nurse leaders may also assist the establishment of organizational structures that foster positive clinicians' attitudes towards AI and provide them opportunities to be involved in all stages of AI creation (Ronquillo et al., 2021). Nurse leaders who are familiar with AI may provide better support for clinicians, management of organizations' big data, and organizational resilience. Although we suggest that nurse leaders should be familiar with the potential of AI, they should also be aware of its possible risks. Thus, we recognize needs for education and training should provide such expertise.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

ETHICS STATEMENT

Following the requirements of the research organization, no Research Ethics Committee approval was required since the interviews did not concern patients or minors, and the interviews did not intervene with physical or mental impunity (World Medical Association Declaration of Helsinki, 2013). Research permission was granted by participating organization.

DATA AVAILABILITY STATEMENT

Research data are not shared.

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COMMENTARY

The changing role of patients, and nursing and medical professionals as a result of digitalization of health and heart failure care

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Abstract

Aim: The aim of the study is to discuss the changing role of patients, nurses and doctors in an era of digital health and heart failure care.

Background: With a growing demand for heart failure care and a shortage of health care professionals to meet it, digital technologies offer a potential solution to overcoming these challenges.

Evaluation: In reviewing pertinent research evidence and drawing on our collective clinical and research experiences, including the co-design and development of an autonomous remote system, DoctorME, we offer some reflections and propose some practical suggestions for nurturing truly collaborative heart failure care.

Key issues: Digital health offers real opportunities to deliver heart failure care, but patients and health care professionals will require digital skills training and appropriate health services technological infrastructure.

Conclusions: Heart failure care is being transformed by digital technologies, and innovations such as DoctorME have profound implications for patients, nurses and doctors. These include major cultural change and health service transformation.

Implications for nursing management: Nurse managers should create inclusive and supportive working environments where collaborative working and digital technologies in heart failure care are embraced. Nurse managers need to recognize, value and communicate the importance of digital health in heart failure care, ensuring that staff have appropriate digital skills training.

KEYWORDS
artificial intelligence, digitalization of heart failure care, heart failure, heart failure professional role, self-management

1 | INTRODUCTION

Care for patients with heart failure is being transformed with the introduction of digital technologies and digital care. For example, health care professionals now have instant access to patient data, and increasingly, face-to-face contacts are being replaced by on-line contacts. As digital technologies are being developed at a rapid pace, this has implications for the care of patients and the roles and relationships of them and their health care professionals, particularly nurses and doctors.

In the early stages of heart failure diagnosis and treatment, health care professionals prescribe treatment and educate the patient and family to effectively manage their condition. While the role of nurses (Blue et al., 2001) and self-care strategies (Moser et al., 2012) are well recognized, the active participation of the patient has become increasingly important and endorsed by the European Society of Cardiology (Fitzsimons, 2019). Accordingly, recent ESC-guidelines promote education and self-care support for patients with heart failure, enabling them to monitor their condition, detect subtle signs of deterioration and take aversive action, thus facilitating them to fully participate in managing their disease and to help them to integrate their illness into their daily lives (McDonagh et al., 2021).

As treatments continue to improve and people survive events that would have previously proved fatal, current care provision is challenged by the increasing volume of people diagnosed with heart failure and the complexity of their management. This is compounded by an exponential rise in the number of chronically ill patients and shortage of health care professionals (Healthcare Personnel Statistics—Nursing and Caring Professionals, 2020). Consequently, health care organizations are searching for sustainable solutions. It is inevitable that patients will play a greater role as they are the only constant factor in their own care process. However, not all patients are able to take on this role due to a range of issues such as frailty, cognitive impairment, fatigue lack of energy, limited health literacy and social isolation (Magnani et al., 2018; Siabani et al., 2013).

Contemporary health care systems recognize the need for new solutions to ensure the maintenance and support heart failure self-management that are accepted by patients and health care professionals. The search for solutions started almost two decades ago with the introduction of digital health into heart failure care, which yielded promising results (Cleland et al., 2005). Since then the use of digital health has been developed aiming to support self-care maintenance and prevent hospitalization (Bashi et al., 2017; Scherrenberg et al., 2021). The Topol review, 'Preparing the healthcare workforce to deliver the digital future' (Topol, 2019), asserted that for optimal implementation of digital care, there is a need to challenge the existing roles of patients, carers and health care professionals and for them to work together to develop, test and implement innovative solutions that put patients at the centre of their care.

2 | TELEHEALTH

The last two decades have seen a growing interest in novel ways to better support patients with heart failure at home. Clinical trials have embraced this approach by including structured telephone support, interactive symptom/vital signs monitoring, or invasive continuous monitoring (Abraham et al., 2011; Boyne et al., 2012; Galinier et al., 2020; Kasper et al., 2002). For example, in a US randomized trial (Kasper et al., 2002) of 200 patients with heart failure recently discharged from hospital, each patient received telephone calls from a nurse who adjusted their medications in line with an algorithm and according to a predefined schedule. In a Dutch multicentre study (Boyne et al., 2012) of 382 patients, 197 were randomized to a digital intervention to report symptoms, knowledge and behaviour to a nurse. Finally, in a French trial (Galinier et al., 2020) of 937 patients, 482 patients reported daily weight, symptoms and received personalized education. Not surprisingly, the results of each study varied in terms of effectiveness in reducing the incidence of hospitalizations or mortality and improving clinical outcomes, which may be attributed to different sample populations, interventions from different disciplines and different outcome measures.

Controversy remains regarding the effectiveness and contribution that noninvasive or invasive support can play in the anticipation or management of decompensating heart failure symptoms (McDonagh et al., 2021). Patients who have access to a specialist multidisciplinary heart failure team may derive less benefit from telemonitoring compared with patients without ready access to such a specialist team. Health care systems, geographical location and funding often limit patients' options and choices on how their condition is treated (Dierckx et al., 2017). Nevertheless, considering that the age of patients with heart failure is increasing, frequent transportation to the health care setting for face-to-face review and titration of evidence-based medications can seem appropriate. During the COVID-19 pandemic, such patients were treated virtually through the use of video call and/or telephone support. Preliminary data from the United Kingdom showed that this enabled a reconfiguration of staff resources to best manage the new circumstances, with lessons learnt that will inform and improve future practice (Bromage et al., 2020). COVID-19 has accelerated the need to find urgent and innovative solutions to the organization and delivery of health care, especially for those patients with long-term, chronic conditions such as heart failure (Ski et al., 2021).

Telehealth has the potential to contribute to a personalized approach and improve access to heart failure care and overcome geographic inequalities. It can also improve self-management and empowerment for people and lead to greater efficiencies in the health care system (Silva-Cardoso et al., 2021). Teleconsultation, telemonitoring and the use of wearable devices and apps for heart failure health and lifestyle support are increasing rapidly, but caution is warranted regarding such technology, especially concerning issues such as data validity and privacy, and support for patients and clinicians using these technologies is an important consideration (Singhal & Cowie, 2021).

3 | CURRENT ROLE OF PATIENTS, NURSES AND DOCTORS

Digitalization of health care is transforming the conventional patient–clinician relationship from a traditionally medically-led model of care where 'doctor knows best', to an approach where patients are actively engaged and share decision making (Mackie et al., 2019). Indeed, patients are becoming more skilled in 'health literacy', and they more commonly research their conditions extensively, which is represented by the 1.6 million searches for health information on the NHS Choices website in 2019 (Topol, 2019). Moreover, patients with heart failure—and their informal caregivers—have demonstrated an interest in the incorporation of digital technologies into their treatment (Zippel-Schultz et al., 2021). From a health care professional perspective, the ability to provide optimal care, such as fortnightly titration of β-blockers as advocated in guidelines (McDonagh et al., 2021), is becoming impossible, as patient numbers increase and resources decline. Furthermore, heart failure specialists may lack the time and resources to periodically review data from noninvasive/invasive monitoring and provide necessary follow-up, when warranted. Digitalization of health care may alleviate these health care challenges by presenting an opportunity for participatory medicine (Barrett et al., 2019). Including patients in care-related decisions and empowering them to self-manage their condition would appear not only acceptable but expected from a patient's perspective (Wattel, 2018). In the current resource-restricted environment, this could be achieved, for example, through the integration of artificial intelligence, along with gamification to increase patient engagement and enable the effective titration of evidence-based medication, without the need for review by a heart failure specialist. The PASSION-HF project extends the concept of telemonitoring into a new era—that of personalized home-based patient care (Barrett et al., 2019). This contemporary form of patient-centred care may improve patient adherence to treatment (Evangelista & Shinnick, 2008), increase patient satisfaction (Hanucharurnkui & Vinya-nguag, 1991), reduce costs incurred by patients (e.g. travel and parking) (DeMonaco & von Hippel, 2007), enhance patient outcomes (Sarasohn-Kahn, 2013) and decrease health care costs (Sarasohn-Kahn, 2013). Ultimately, the majority, if not all, areas of health care will be influenced by the adoption of digital technologies over the next 20 years (Topol, 2019). Therefore, training in digital skills for health care staff is essential, with effort employed to avoid digital exclusion for patients and staff, which should facilitate equality of engagement across different geographies and socio-economic groups (NHS Digital, 2019).

4 | HOW THESE ROLES WILL LOOK IN CASE OF A WELL-FUNCTIONING DOCTORME

Given that the current roles in health care mainly consist of active monitoring or data collection (explicit data), it is expected that passive monitoring (implicit data) will play an important role in the future. And this will mainly involve noninvasive implicit data. This includes noninvasive biosensors and also sensors in smartwatches and smartphones. An advantage of collecting implicit data is that the patient and health care professionals are not burdened by it. After all, the patient does not notice it, and the health care professional does not have to do anything for it. This results in a direct increase of available patient data that can then be used to make health care decisions.

This increase in patient data also provides an opportunity to redirect health care provision towards preventive rather than reactive care. With the increase in pressure on care, one sees that only necessary care is provided, for instance care in response to a deterioration in a patient's condition. With the help of e-health and artificial intelligence, the focus can be more on predictive and preventive medicine (Barrett et al., 2019). This means that not only the current condition of a patient is treated, but the emphasis is also explicitly on the long-term treatment of patients.

Because artificial intelligence can make use of a lot of available data, it is not inconceivable that e-health applications will later become the gatekeeper for the patient. Patients increasingly have to deal with comorbidities, and these require complex treatments with extensive guidelines. Treating multiple comorbidities with the current complex guidelines is sometimes difficult enough.

E-health is already reducing burden on patients and health care professionals (e.g., by reducing the administrative burden) and will generate more data on which preventive (and personalized) health care can be applied. This in turn will give patients the opportunity (with the help of e-health education) to get to know their illness better and deal with it better, which in turn will increase the patient's confidence in self-care. Health care professionals will have more time for the patient with more complex needs, and also for their circumstances, not just their illness.

5 | DOCTORME AS AN ALTERNATIVE DELIVERY OF CARE VERSUS ADJUNCT TO USUAL CARE

In 2018, the PASSION-HF consortium, consisting of clinical heart failure specialists, software developers and academic researchers, embarked on the co-design and development of a medical device, with the potential to revolutionize the delivery of modern-day heart failure management. The study, funded by Interreg NWE, is due to complete in 2023. Members recognized that over the last two decades, telemonitoring has been an adjunct to usual care, whereby the patient remotely engages with the health care system; however, direction in terms of medications and lifestyle remained at the discretion of the health care professional who receives his/her data. As a result, gaps remain in the 'real world', in terms of the timely application of current evidence-based therapies (Bayes-Genis et al., 2018) as often health care professionals delayed decisions pending additional clinical data (blood pressure, renal function) or uncertainty regarding follow-up.

DoctorME will alleviate the burden on heart failure specialist, allowing them to focus on the most complex conditions, by offering safe and effective titration of evidence-based medications based on

artificial intelligence and guideline-based algorithms, with the ability to provide personalized advice directly to the patient. As an autonomous remote system, DoctorME will provide 24/7 support and education to patients with heart failure (Ski et al., 2020). No longer will guidance be limited to Monday–Friday, 9:00 AM–5:00 PM, rather it will be immediate, though with onward referral to a heart failure specialist if DoctorME detects an acute deterioration in the patient's condition. The PASSION-HF consortium is using artificial intelligence as an enabler to optimize effective heart failure care in consideration of disease complexity. DoctorME promotes joint decision making through upskilling, educating and subsequently empowering patients to achieve optimal self-management (Ski et al., 2021).

A recent qualitative study of 49 patients and 33 of their informal caregivers aiming to explore determinants of their acceptance regarding a system such as DoctorME—found four main themes: (1) needs and expectations, giving information about the expected benefits; (2) preferences regarding the care process, dominated by the perceived benefits of the familiar patient–doctor relationship and the human aspects of care process as a reflection of the necessary learning effort or the change in behaviour to be made, when using the system; (3) perceived risk, focusing on possible errors; and (4) trust, based on the belief that the doctor-at-home delivers what is promised. Participants expressed a desire for reassurance and a wish for more support in the management of heart failure, envisioning such a system as a potential daily companion supporting their daily routines. They were receptive to changes to the current health care process, though trust was identified as an important basis for acceptance and use. Perceived risk for decision-making errors, which may be potentially life-threatening, was a major concern and a barrier to adoption of such a system. However, overall patients and informal caregivers were receptive and saw clear benefits of digitalization in health care and that an interactive decision-making system for patients could empower and enable effective self-care (Zippel-Schultz et al., 2021).

These findings are generally congruent with those of recent reviews of technology-based support for caregivers of stroke patients (Lobo et al., 2021) and for nurses (Gan, 2020). In their rapid review, Lobo et al. (2021) highlight the influences of technology in improving stroke caregiving and the need to include user-centred design principles to create a meaningful, actionable and feasible system for caregivers, specifically its delivery process and ability to meet the needs of the individual. With regard to health care professionals, Gan (2020) found that technology, specifically telehealth and telementoring, can help nurses monitor patients remotely and contribute to patient education and counselling, as well as maximize mentoring opportunities, the provision of support and learning among nurses. The growing shortage of nurses demands flexibility of care and staffing and that alternative and creative ways of working are considered. Nurse managers want to deliver safe, quality care while containing staffing levels and avoiding unnecessary costs. Digital health technologies such as described offer nurse managers alternative, creative ways of working, which can alleviate some of the physical and emotional demands of traditional bedside nursing, prove more rewarding and job-enriching, improve continuity of care and be cost-effective.

As noted by Lobo et al. (2021), the purpose of these systems is to promote person-centred care (Dyb et al., 2021) and transform current health care practices through the promotion of information delivery, expansion of care and empowerment of individuals to manage their health (Mermelstein et al., 2017). Digital technologies and innovations such as DoctorME offer a practical, innovative means of achieving these.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

Nurse managers are challenged with creating inclusive and supportive working environments where collaborative working and digital technologies in heart failure care are embraced. To ensure this happens, nurse managers need to communicate a clear message of the importance of valuing digital health, ensuring staff have the appropriate digital skills training.

7 | CONCLUSION

Heart failure care is being transformed by digital technologies, and innovations such as DoctorME have profound implications for patients, nurses and doctors. These include cultural change and health service transformation. There will be a need for patients and health care professionals to acquire some element of digital skills and for health services to have the appropriate technological infrastructure.

CONFLICT OF INTEREST
The authors have no conflict to declare.

DATA AVAILABILITY STATEMENT
Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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Experiences and perceptions of final-year nursing students of using a chatbot in a simulated emergency situation: A qualitative study

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Abstract

Aim: The aim of this study is to explore the experiences and perceptions of final-year nursing students on the acceptability and feasibility of using a chatbot for clinical decision-making and patient safety.

Background: The effective and inclusive use of new technologies such as conversational agents or chatbots could support nurses in increasing evidence-based care and decreasing low-quality services.

Methods: A descriptive qualitative study was used through focus group interviews. The data analysis was conducted using a thematic analysis.

Results: This study included 114 participants. After our data analysis, two main themes emerged: (i) experiences in the use of a chatbot service for clinical decision-making and and (ii) integrating conversational agents into the organizational safety culture.

Conclusions: The findings of our study provide preliminary support for the acceptability and feasibility of adopting SafeBot, a chatbot for clinical decision-making and patient safety. Our results revealed substantial recommendations for refining navigation, layout and content, as well as useful insights to support its acceptance in real nursing practice.

Implications for Nursing Management: Leaders and managers may well see artificial intelligence-based conversational agents like SafeBot as a potential solution in modern nursing practice for effective problem-solving resolution, innovative staffing and nursing care delivery models at the bedside and criteria for measuring and ensure quality and patient safety.

KEYWORDS
artificial intelligence, chatbot, evidence-based practice, nursing, patient safety

1 | INTRODUCTION

Clinical patient safety aims to reduce any risk associated with care to a reasonable threshold (World Health Organization - WHO, 2009). While the race to ensure clinical patient safety began with the publication of 'To Err is Human' (Institute of Medicine, 2000), two decades later, it remains one of the most important critical dimensions of quality of care, as well as an international challenge for both health care organizations and educational institutions (Kirwan et al., 2019). In this context, the provision of safe and high-quality health care will be dependent on clinical judgements and decisions made by professionals at all levels of the health care system (Melin-Johansson et al., 2017). The clinical decision, by definition, is a complex, dynamic selection process with numerous variables to be considered, resulting from the critical reasoning process and derived from both the knowledge and experience of the professional (Farčić et al., 2020; Manetti, 2019), in which, depending on the decision taken, the expected results can either have a positive impact or seriously compromise the clinical safety of the patient (White et al., 2021).

Nurses are continually making decisions as part of the care process, each of which requires four separate stages: information collecting, analysis, decision-making and implementation (Akbar et al., 2021). Yet, the evidence indicates that there is still a gap in explicit training in problem-solving strategies and critical thinking, which frequently leads to an inadequate decision-making competence (Chen et al., 2021). Recent research with newly graduated nurses shows how insecurity in decision-making leads to the need for a second opinion in the first place, which generally responds to an informal source of information, possibly based on clinical nursing practice but not always on evidence (García-Martín et al., 2021). Clinical nursing practice and clinical simulation allow nursing students to acquire the skills required for professional practice while also supporting them in making independent clinical decisions and cultivating social problem-solving abilities (Ahmady & Shahbazi, 2020; Gandhi et al., 2021). In this context, the effective and inclusive use of new technologies could support nurses and nursing students in increasing evidence-based care and decreasing low-quality services (Braithwaite et al., 2020; Hospodková et al., 2021; Saini et al., 2017), including harmful care to patients, which is estimated to account for 10% of all iatrogenic harms or adverse effects of care worldwide (National Academies of Sciences, Engineering, and Medicine et al., 2018).

Over the last few decades, technological advances in voice recognition, natural language processing (NLP) and artificial intelligence (AI), as well as advances in components to support this type of technology, have increased the availability of dialogue systems for use in differing fields such as economics (Mai et al., 2019), business (Davenport et al., 2020) and health care (Schachner et al., 2020). Conversational agents are dialogue systems that use both AI and NLP, including a learning system based on statistical models that learn from data and make predictions based on a number of features (Kidwai & Rk, 2020). These agents can detect and interpret verbal and written language in order to engage with people via speech or writing in multiple formats such as web-based platforms, audio

recordings or mobile apps (Milne-Ives et al., 2020). Chatbots are now available in different degrees of sophistication, ranging from more advanced models such as robots, holograms or avatars to simpler forms such as chatterboxes, in which the user can interact with an AI via written language or typing and maintain a conversation through an interface that generates conversation parameters and natural responses (Xu et al., 2021).

Notwithstanding most conversational agents in the health sector have been developed with the aim of incorporating patients in their health process (Jang et al., 2021), as well as targeting a population with limited access to the health system or with little information on health issues (Gardiner et al., 2020), little is known about their application in nursing clinical practice training and clinical simulation to promote efficient clinical decision-making and problem-solving abilities in patient safety. Thus, the aim of this study was to explore the experiences and perceptions of final-year nursing students on the acceptability and feasibility of using a chatbot for patient safety by incorporating the best evidence-based dataset into their clinical decision-making process.

2 | MATERIALS AND METHODS

2.1 | Design

A qualitative descriptive study was conducted using focus groups from September to November 2021 (Sandelowski, 2000). In this study, students used a task-based conversational agent to assess and manage an acute pesticide poisoning in a simulated rural primary care setting.

2.2 | Participants

The study was carried out at the University of Almeria. The selection criteria included final-year nursing students who (i) were enrolled in Research Methodology module, (ii) attended to more than 80% of lessons and (iii) whose participation was voluntary. Participants did not receive any previous chatbot training prior participating in this study. Furthermore, participants were advised that their experiences would not have any bearing on their academic grades. Sociodemographic characteristics are summarized in Table 1.

2.3 | Procedure

The chatbot, called 'SafeBot', was designed as a decision tree algorithm conversational agent to support nursing students in assessing and managing an acute pesticide poisoning in a simulated rural primary care setting. The preliminary content for the chatbot was developed by the authors based on the Reason's Swiss cheese model for patient safety (Seshia et al., 2018). This model combines the concepts underlying the Swiss cheese model (e.g., active involvement of

stakeholders, coordination and collaboration across organizations, promoting a safety culture and automating tasks) and cognitive biases plus cascade to better understand the complexities of reducing harm and provide an evidence-based strategy for proposing potential solutions for adverse events (Reason, 2000). In this manner, the chatbot content integrated evidence-based strategies and information for acute pesticide poisoning that used a framework theory to foster well-informed clinical decisions and reduce potential error-provoking factors such as unhealthy cultures or an inadequate knowledge-experience-skill set (Afshari et al., 2021) (Figure 1).

The prototype chatbot system was designed as a health care application webchat that could be accessed via mobile and desktop devices. The purpose of using this prototype in a single simulated scenario was to collect more detailed qualitative data that could be used to develop a more accurate conversational agent based on nursing needs and expectations. Each interaction began with a welcome message that explained the purpose and capabilities of the chatbot using two preselected input phrases tied to specific situations: 'Are you in a primary care setting?' or 'Are you in a hospital care setting?' Once participants selected one of these two paths, they could self-direct to different methods in assessing an acute pesticide poisoning patient. Overall, the performance of the task-based chatbot followed the architecture depicted in Figure 2.

TABLE 1 Demographic characteristics of participants

Characteristics	Number (n)	Percentage (%)
Age		
18–23	96	84.21
24–29	10	8.77
30–35	3	2.63
36–41	2	1.75
42 and above	3	2.63
Sex		
Female	91	79.82
Male	23	20.18
Previous experience with chatbots (e.g., goal-based shopping chatbots)		
Yes	26	22.81
No	88	77.19

2.4 | Data collection

Researchers developed and agreed on an interview protocol based on the reviewed literature to encourage participants to give in-depth answers about the topic (supporting information Table S1). The primary researcher approached each eligible participant and invited them to participate. Twelve focus groups (FGs), composed of 8 to 12 students each, were conducted at the University of Almeria in September 2021 by two researchers, one of whom was a qualitative methods expert and an observer who assisted and took field notes. These group interviews were digitally audio recorded and lasted between 40 to 60 min. Data collection was continuously analysed through an iterative process until data saturation was reached. Participants were given the option to revise the recorded transcripts and read their transcriptions before beginning the data analysis process to ensure that their views were accurate.

2.5 | Data analysis

Data analysis was based on thematic analysis and supported the ATLAS.ti v9.0 software (Braun & Clarke, 2006). First, recording interviews were transcribed by two researchers and familiarized themselves by reading all transcripts repeatedly and organizing relevant data into meaningful codes of the first two interviews in an inductive and exploratory approach. Codes were reviewed and altered to assimilate new data as coding continued, which were then classified into potential themes to reflect participants' experiences and perceptions. Following that, these themes were reviewed by reading all codes and the entire set of data to confirm thematic validity before defining and naming them and preparing a final report (Figure 3).

2.6 | Ethical considerations

This research was conducted out with the agreement of the Ethics Committee at the University of Almeria (EFM 159/2021) and in accordance with the Declaration of Helsinki's ethical principles. Confidentiality and anonymity were ensured by assigning alphanumeric IDs to each participant (letters 'G-X' [group] and 'P-X' [participant]). Prior to the study, participants provided informed consent and had the option to withdraw at any moment.
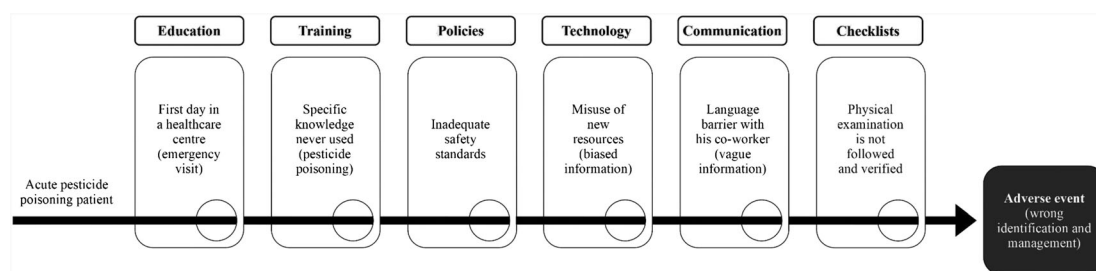
FIGURE 1 Each slice of Swiss cheese model as error-provoking factors in adverse events (acute pesticide poisoning)

FIGURE 2 System architecture for the proposed chatbot
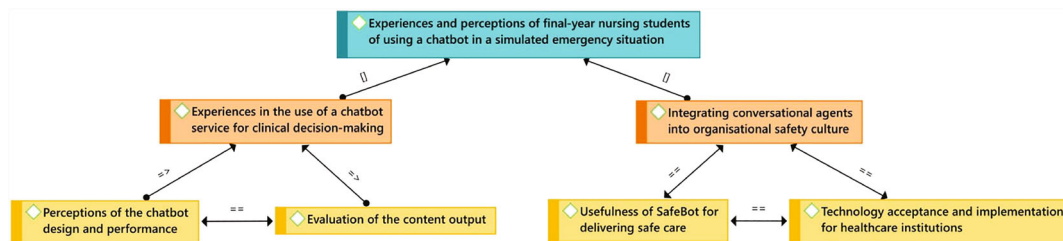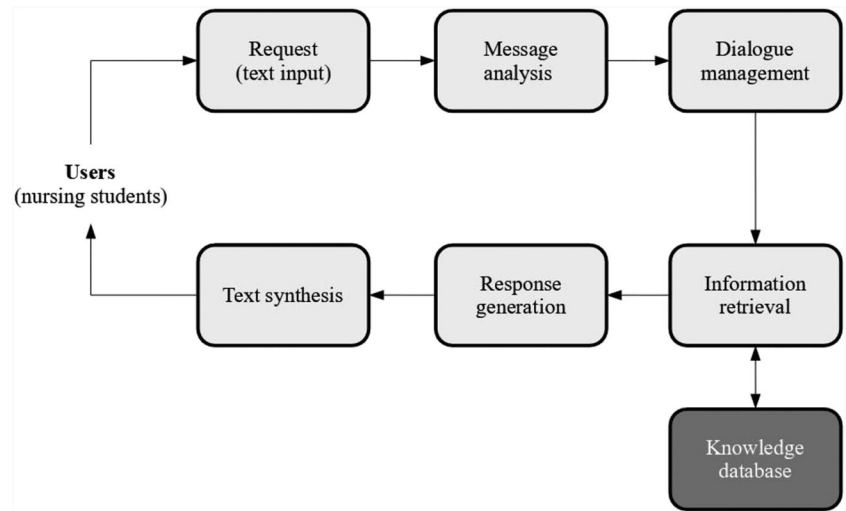
[]: is part of; ==: is associated with; =>: is cause of

FIGURE 3 Conceptual map based on fourth-year nursing students' experiences with using a chatbot for clinical decision-making and patient safety

2.7 | Rigour

Methods and findings are reported in line with the consolidated criteria for reporting qualitative (COREQ) research principles (Tong et al., 2007). The credibility, transferability, dependability and confirmability criteria developed by Lincoln and Guba (2006) were used to assess trustworthiness. Additionally, two researchers conducted thematic analysis independently to confirm its validity and accuracy. If their analyses differed, a third researcher was consulted to reach an agreement. All of the researchers agreed on the final results. The researchers participating in the chatbot design were not the same as those in charge of data collection. None of them were involved into the academic module assessment.

3 | RESULTS

3.1 | Participant characteristics

One hundred fourteen final-year nursing students participated in 12 FGs, representing a participation rate of 79.17% ($N = 144$ total final-year nursing students). The average age of the nursing students was 22.71 years old ($SD = 5.75$), with a range of 19 to 57 years.

Generally, 79.82% of individuals ($n = 91$) identified as female, whereas 20.18% identified as male ($n = 23$). Table 2 summarizes the findings of qualitative analysis, which identified two primary themes.

3.2 | Theme 1: Experiences in the use of a chatbot service for clinical decision-making

This first theme focuses on the participant's interaction with SafeBot during a simulated emergency situation. Participants expressed their perceptions on its design and performance, such as how this tool organized the information, how the flow was, its feasibility, as well as some visual appeal, among others. Moreover, the participants highlighted some characteristics of the chatbot content, such as its pace, precision or adequacy.

3.2.1 | Subtheme 1.1: Perceptions of the chatbot design and performance

The majority of participants indicated positive experiences with the chatbot during the simulated scenario, outlining its brevity, usefulness and user-friendliness. However, some participants emphasized some

TABLE 2 Themes, subthemes and representative quotes

Main themes	Subthemes	Representative quotes
Experiences in the use of a chatbot service for clinical decision-making	Perceptions of the chatbot design and performance	'It was interesting that the chatbot only had text-based buttons because in a stressful situation, such as the simulated case, where you have to assess the patient quickly, you may not want to waste time typing or even being blocked if you have to talk with a machine instead of a person' G12-P4
		'I like the idea of a tool that can organise all of the information that is sometimes complex and maybe can be useful in care settings. Not just in emergency situations, but also in primary care and hospitalisation. The only thing that I missed was finding more options because you sometimes need identify other things that could be introduced by voice rather than just following the software roadmap' G1-P7
	Evaluation of the content output	'The chatbot information was precise and concise, as we were in an emergency situation and needed to act as soon as possible. Perhaps in other care settings, it would be a good idea to include more information or give us the option to click on links that provide us with more evidence-based information' G8-P6
		'The content that appeared on the screen when the final decision was made was quite informative. It was comprehensive and useful, but the screen before failed to provide us with enough information to clear our thoughts and determine whether we were on the right direction' G10-P2
Integrating conversational agents into organizational safety culture	Technology acceptance and implementation for health care institutions	'From my point of view, I believe that what many people may think about this chatbot is that it will eventually replace us. It is necessary to demonstrate that it is not intended for replace anyone, but to provide safer and high-quality care' G9-P8
		'I found it useful in the sense that it can be a resource we can use in our day-to-day work because of the amount of care that we offer and because of the rush, we sometimes need something that helps us to solve some question that we had at the time. Yet, I also see a need for a good design, for example, in the data treatment, how to collect the data, and so on, so I think this can make professionals think about what is being used and how their data is managed' G5-P2
	Usefulness of SafeBot for delivering safe care	'It makes me wonder how this chatbot can boost our confidence in our nursing practice. This type of technology supports you because you know it uses evidence-based information, and if you have any doubts, it is a quick and user-friendly tool

(Continues)

RIGHTSLINK()

TABLE 2 (Continued)

Main themes	Subthemes	Representative quotes
		to clarify any question that arise in any care setting' G4-P5
		'It will depend on the care setting in which the chatbot will be implemented because, for example, in an emergency unit the time to interact with the chatbot is so limited. It could be interesting develop other types of chatbots that allow for faster interaction, such as voice recognition, rather than text or text-based buttons, which may be more difficult to be used in that context' G3-P1

aspects for improvement, such as the accuracy of the information or the suitability of the colours used:

> *'I found the use of the chatbot in an emergency situation to be incredibly helpful and user-friendly, a real safe boat! On a management level, I think it was quite intuitive; it was simple to navigate between the options provided, it was quick, and it allowed us to make a faster and evidence-based decision. I believe that if we hadn't had this tool, we would have had more doubts and would have taken longer to assist the patient, whereas this chatbot can clear up many of the doubts that can arise in these kinds of cases'* G5-P9

> *'It was very interesting! Yet, it drew my attention because I am colourblind and it might be interesting to consider colours when designing the layout of resources like this. Due to the contrast of the font and background colours on some screens where I had to interact with the chatbot, it was difficult to read and see the options available'* G2-P3

3.2.2 | Subtheme 1.2: Evaluation of the content output

Although many participants mentioned the applicability of using SafeBot to improve patient safety and the quality of care provided in any health care unit, as well as to have thorough information about a specific issue, some of them stated that they missed having the possibility to further explore the information to confirm its appropriateness:

> *'The content was concise, it provided the necessary information to move forward in the pesticide poisoning patient care process, and, most importantly, it appears to be quite useful in the content organisation that we can have about a niche area, such as poisoning, for example. Maybe this type of tech can help us in getting straight to the point and identifying what we require'* G12-P6

> *"In terms of content, I thought it was too brief. I would have liked to find more information or, perhaps, any option where I could select 'find out more' to see if this is what I wanted to select or not. You can pick 'the patient is conscious or unconscious' in the first option, but moving forward, we find an option that asks 'What type of pesticide could the patient have been exposed to?' and perhaps it would have been useful to check exactly what each type of pesticide was"* G8-P8

3.3 | Theme 2: Integrating conversational agents into organizational safety culture

This theme shines a light on the importance of the benefits of using chatbots like SafeBot for nurses and patients, which can lead to an improvement in the quality of care delivered and patient safety and also the relevance of the acceptance among nurses for its use.

3.3.1 | Subtheme 2.1: Technology acceptance and implementation for health care institutions

Based on their placement experiences, some students pointed out the significance of involving nurses at the bedside care in the development and implementation of the chatbot because, as they outlined, new implementations can be perceived by professionals as adding to their workload. Furthermore, they also indicated that these innovations are sometimes rejected due to professionals' fear of the unknown and a feeling of not being supported by their managers, as well as some concerns related to data security management and other privacy issues:

> *'To be honest, I believe that the professionals' acceptance of this resource might be influenced by their fear of the unknown rather than their age. In my placements, for example, I see that it could not be related to the professionals' age, but to their fear of change. I believe that if you do not imply professionals in the development of the chatbot, we will return to the same routine, the*

imposition of new instruments, equipment, etc., that eventually, they consider a burden and a waste of time' G9-P1

'Mostly, it will depend on the support that professionals receive from managers, sisters and administrative because many things that they ask to be used are just being left in there and they think that the professional should learn to use it. It is necessary for these professionals to be trained on how to use these resources as they can help professionals in providing a safer care' G1-P4

3.3.2 | Subtheme 2.2: Usefulness of SafeBot for delivering safe care

A large number of participants found the chatbot handy for their professional work because of its availability and ability to resolve doubts at any time, as well as a sense of self-confidence as a future novel nurse where the chatbot can help them when facing complex situations and the security of finding evidence-based information. On the other hand, they stated that the chatbot can be improved by developing a chatbot with voice recognition to be able to interact faster than typing or selecting options:

'I believe that SafeBot can be useful in terms of clinical patient safety, not only in emergency situations like the one used in the simulation, but also in primary care and other hospitalisation units. I believe that these types of resources, in particular, help us to organise our knowledge and keep us up to date on the most recent evidence available' G9-P2

'This chatbot is convenient for nursing professionals for several reasons. First, because it's available 24/7, it can allow us to confirm some knowledge that we have some doubts about, such as which is the scientific evidence about the correct collocation of a nasogastric tube, or even the ability to get information in the moments that you need to get updated faster and without having to use a database, create your research strategy, etc. I believe it is a simple, quick, and useful resource' G7-P4

4 | DISCUSSION

This study was aimed to explore the experiences and perceptions of final-year nursing students on the acceptability and feasibility of using a chatbot for clinical decision-making and patient safety. After analysing our results from the FGs, it was found that almost all participants reported positive feedback in terms of usability and acceptability, inferring a qualitative improvement in clinical decision-making and problem-solving abilities for patient safety in a simulated

scenario. While the design and use of conversational agents for patient-chatbot interaction in niche areas such as mental health and long-term care have been widely discussed (Abd-Alrazaq et al., 2021; Fitzpatrick et al., 2017; Schachner et al., 2020), this study yields some interesting and relevant findings regarding the use of professional–chatbot interaction in order to provide precise, evidence-based and timely decisions in patient care and safety. Nursing knowledge-driven and management processes are certainly gaining traction in order to leverage the best information available to ensure the quality and safety of care provided (Braithwaite et al., 2020; Shahmoradi et al., 2017); however, to the best of our knowledge, this is the first study to explore the use of task-based AI to promote patient safety by incorporating the best evidence-based dataset into the clinical decision-making process.

Our findings, like those of other studies (Abd-Alrazaq et al., 2021; Dhinagaran et al., 2021), denoted that participants found the design and performance to be engaging and motivating but also improvable. Although most participant reported that the chatbot had a clean design and user-friendly navigation system, other impressions were more centred around the idea of usability and its current limitations. Suggestions included highlighting not only the most essential information or allowing users to select interface colours or colour schemes, particularly for visually impaired professionals, but also other extensions of use such as oral interaction with the conversational agent (Koman et al., 2020). Others, on the other hand, suggested that a button-based navigation system could be sufficient, if not preferred, over free-text or voice interaction, which would be especially relevant to broader accessibility and valuable for new professionals who may not know the specific information they require during their clinical decision-making process (Beilharz et al., 2021; Curran et al., 2019).

A number of studies are currently looking for new approaches to integrate chatbots and AI-based conversational agents to support health-related activities, albeit the quality of content still needs to be improved (Park et al., 2019; To et al., 2021). While the information was found to be adequate, accessible and useful, nearly all participants felt that the content output could be more concise, accurate and employ appropriate length responses and also include other options to motivate participants to explore other related content at their own pace (Stal et al., 2021). One possible explanation for this could be the need of different levels of chatbot personalization (intrinsic, extrinsic or a mix of both) in order to create user profiles or user models and support personalized and adaptative features (Fang et al., 2018; Kocaballi et al., 2019). Indeed, earlier research has shown that adaptive conversational approaches such as determining level of expertise or confirmation strategies can improve system performance, usability and efficacy in clinical decision-making, resulting in increased accuracy and patient safety (Abd-Alrazaq et al., 2021).

These technologies may support organizations, senior nurses and other health managers in reducing biassed judgement and decision-making at both the individual and group levels, which may have a negative impact on patient safety at all levels of the health system (Mannion & Thompson, 2014). Based on our findings, however, there are certain challenges to be considered when integrating

conversational agents in real nursing practice. Whereas there appears to be a positive mindset and self-efficacy toward adopting a chatbot, adequate resources, time, training and knowledge are required to support acceptance and long-term use among nursing students and professionals (Brandtzaeg & Følstad, 2018; Følstad et al., 2018). This technology may support nurses and nursing students in making informed decisions during the patient care by automating the data process; however, the final clinical decision should rely on their clinical judgement, considering current evidence and a view of appropriate clinical practice (Akbar et al., 2021; Araujo et al., 2020). It should be noted that there may be professional concerns and reservations about using chatbots, including fear or uncertainty for the unknown, ethical and privacy implications or the perception of additional workload (Mokmin & Ibrahim, 2021). For these reasons, recent research suggests that front-line professionals should be involved in the design and implementation of decision-making support systems, sharing their perspectives and verbalizing their perceptions and underlying nursing practice requirements, thereby promoting a better adoption of their use for care quality and patient safety (Fritz & Dermody, 2019). Despite these findings lend weight to the idea that the digital age and the speed with which information is transmitted are transforming communications and clinical practices, the research on the use of conversational agents in nursing practice for patient safety is still limited (Curran et al., 2019; Rouleau et al., 2017). This could be explained by the fact that the most current software available for implementing conversational agents is fee-based and thus not cost-effective to maintain in clinical practice (Barthelmäs et al., 2021). Surely, some participants mentioned the usefulness and beneficial effects that such advances may have in promoting evidence-based clinical decision-making at the bedside, regardless this technology is not currently present in their actual clinical placements (Martinez-Garcia et al., 2021). Emerging information and communication technologies, such as AI-based conversational agents, may not only contribute in better patient safety judgements and decisions but also introduce new avenues for higher organizational safety culture values (Akbar et al., 2021). The use of more transparent knowledge sharing among organizational members through use of reliable resources may improve clinical decision-making abilities of nurses and develop methods for using common knowledge at an organizational level to promote trust and organizational culture (Yoo et al., 2019).

Conversely, there are important limitations to consider when interpreting our results. Given the exploratory nature of our study, nursing students were chosen to avoid potential technological barriers using a homogeneous sample within an uncommon clinical situation. Nursing students were only expected to interact with the task-based chatbot using a specified individual case scenario, a pesticide poisoning patient in primary care settings. This study also lacks a concrete measure for evaluating the chatbot interaction. Although there are considerable inventories for evaluating evidence-informed decision-making competence in nursing practice and training interaction with chatbot (Belita et al., 2021; Mokmin & Ibrahim, 2021), no studies have been found to explore the use of a toolkit to assess nurses-chatbot

conversations pertaining patient safety. To the best of our knowledge, no study has yet focused on the design of a chatbot for student or professional–chatbot interaction in clinical decision-making and patient safety, which has limited our discussion. Rather than concluding this topic, however, our findings warrant further discussion. Future research should explore a gamut of clinical scenarios and may use our preliminary findings to provide a more sophisticated chatbot design. A future challenge for the chatbot should be to include professional nurses and account for their needs in the design for accuracy, as well as to include other advanced forms of chatbots such as AI-based conversational agents with deeper levels of extrinsic personalization.

5 | CONCLUSIONS

The findings of our study provide preliminary support for the acceptability and feasibility of adopting a chatbot for clinical decision-making regarding nursing care and patient safety in certain situations, although more research using diverse methodological approaches is required. Our results revealed not just an overall positive response to the design, performance and content output but also substantial recommendations for refining navigation, layout and content, as well as useful insights to support its acceptance in real nursing practice. SafeBot may constitute a down-to-earth resource to help cover gaps in service delivery in terms of patient safety and to support clinical decision-making with appealing and easily available evidence-based information.

5.1 | Implications for Nursing Management

The rapidly changing digital era states the importance and urgency of strategies to improve present and future care delivery, clinical decision-making and patient safety. The use of chatbots by nursing and health care professionals promotes the adoption of best available evidence in practice, which might be particularly helpful for newly graduated professionals and novice practitioners. Leaders and managers may well see AI-based conversational agents like SafeBot as a potential solution in modern nursing practice for effective problem-solving resolution, innovative staffing and nursing care delivery models at the bedside and criteria for measuring and ensure quality and patient safety. While more research on the development and testing of more sophisticated conversational AI is required, these findings will contribute in driving new methods in the future landscape of nursing practice and promoting organizational safety culture.

CONFLICT OF INTEREST

The authors have no conflict of interest to report.

ETHICS STATEMENT

The study was approved by the Ethics Committee at the University of Almeria (EFM 159/2021).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

EDITORIAL

WILEY

Sustainable Development Goals—A clarion call for leadership in nursing and midwifery

The UN call to action to reduce global inequities by 2030 and the mantra where 'no one is left behind' is a compelling blueprint to end poverty, improve the planet and improve the lives of all (UN, 2016). The year 2020 was to be one of celebrations as the World Health Organization (WHO) had declared it to be the international year of the Nurse and Midwife; and the United Nations (UN) had just celebrated the 75th anniversary of the formation of the UN and the fifth anniversary of the commitment of 193 world leaders to the 17 Sustainable Development Goals (SDG) (UN, 2020a; WHO, 2020). What emerged in 2020 was not a year of celebrations but the beginning of a global SARS-CoV-2 (COVID-19) pandemic. The pandemic has provided a lens through which to view the depth of global inequity, acknowledged the fundamental need to achieve SDGs and recognize the importance of nurses' and midwives' amplified voices as stakeholders at micro, meso and macro levels influencing global policy and practice. At the time of writing, approximately 611 million cases of COVID-19 were registered globally, in excess of 6.5 million deaths reported, and over 12 million vaccine doses administered (WHO, 2022).

The 17 Sustainable Development Goals (SDG) are the roadmap for action to end global inequities and poverty and improve the health and well-being of all: (1) No Poverty, (2) Zero Hunger, (3) Good Health and Well-being, (4) Quality Education, (5) Gender Equality, (6) Clean Water and Sanitation, (7) Affordable and Clean Energy, (8) Decent Work and Economic Growth, (9) Industry, Innovation and Infrastructure, (10) Reducing Inequality, (11) Sustainable Cities and Communities, (12) Responsible Consumption and Production, (13) Climate Action, (14) Life Below Water, (15) Life On Land, (16) Peace, Justice and Strong Institutions and (17) Partnerships for the Goals (UN, 2016). Despite the international commitment to the SDG agenda, COVID-19 has demonstrated an unjust world, and the mortality and morbidity experienced by those with the least resources emphasize governments' political, economic decision making and social policies on health and well-being (Cannon, 2020). Khoo (2020) describes those with the poorest outcomes during COVID-19, including *populations within a population*. These included people with disabilities and workers in low-paid, but essential service and personal care sectors, the vulnerability of institutionalized in care homes, migrant and detention centres and prisons and those who lack secure doors and shelter, including migrant workers and people experiencing homelessness (p. 10).

At the same time, nurses' and midwives' roles have come to the fore internationally, placing them front and centre in caring roles; also acknowledging their heightened risk of contracting COVID-19 through deficiencies in the availability of personal protective equipment (PPE) and the lack of safety equipment. Furthermore, additional challenges encountered by nurses and midwives included working in intense workplaces, managing quarantine, social discrimination and the dual responsibility of caring for family (WHO, 2021), with Mutambudzi et al. (2021) reporting a sevenfold increased risk of severe COVID-19 (RR 7.43, 95% CI 5.52 to 10.00) compared with other essential workers.

The critical role of nurses and midwives in healthcare and meeting SDGs was articulated (pre-pandemic) by the WHO (2020), confirming a need for 9 million nurses and midwives to achieve SDG 3 by 2030. The pandemic has reignited the strategic value of nurses and midwives in planning, developing, delivering and leading compassionate health systems fit for purpose. Thus, achieving health for all depends on sufficient numbers of nurses and midwives globally.

The 193 countries are at the midpoint in assessing their progress in achieving the SDGs; the pandemic's impact emphasizes the chasm. Grant et al. (2022) describe a world that is unprepared to achieve the 169 SDG targets, with systems in shock due to the pandemic and the realization of inadequate and siloed approaches to health, environment, education and economic sectors. Progress is critical, and nurses' and midwives' voices should intensify in shaping policy and practice to reduce injustices.

Our call for this special issue provided an opportunity for nurses and midwives to inform practice and policy conversations through research accumulated during a global pandemic and framed in the SDGs. Previously, we have individually written on the role of nurses supporting the United Nations convention on Human Rights (UN General Assembly, 1948) in navigating complex health systems to reduce health inequity and improve health outcomes in society. Our papers identified the role of public health and community nurses and the importance of SDG Goal 5 explicitly addressing women's health care (Davidson, 2016; Frazer et al., 2020). In this special issue, we provide a platform to make visible practitioners' contributions during global distress and economic instability. The reach of contributions from China, Africa, Taiwan, South Korea, the United States, Albania and Italy is impressive and underscores the range where nurses are influencing SDG targets. The positive association of degree nurses and critical competency was highlighted by Wang et al. (2022) in delivering maternal and neonatal health care. A review of evidence

from Luque-Alcaraz et al. (2022) notes the lack of data and consultation with nurses regarding policy making for sustainable health care systems and a need for more education, reinforcing Osingada and Porta's (2020) earlier paper highlighting nurses' limited scholarship on SDGs and observing a leadership opportunity. Hsieh et al. (2022) described the reduction in stress among nurses associated with use of gong meditation as a tool to improve mental well-being. Globally, the prevalence of mental illness increased during COVID-19 and the impact on society and health care workers specifically is accepted (UN, 2020a). Systems supporting workforce planning are reported in Shaffer et al. (2022) discussion on migration of nurses and the implications. Saralegui-Gainza et al. (2021) analyses identified the density of nurses and midwives pre pandemic in the 50 counties of sub-Saharan Africa increased in only seven. They note the macro level actions required for workforce planning to achieve SDGs. While Han and Lee's (2021) study examined policy formation in Korea and the importance of learning from a previous pandemic and missed care in shaping current workforce planning.

Nurses and midwives are trusted professionals (Anders, 2021), and their collective voice is needed if we are to progress the SDG agenda and reorient services. This includes shaping conversations for ethical recruitment practices ensuring workforce stability worldwide, and not focusing solely on high-income countries' demands. Nursing education can provide leadership in embedding SDGs in curricula enabling the next generation of nurses and midwives to be positive mediators in creating health and social-economic policy.

The pandemic has provided a clarion call, a burning platform, and we need to take words from the page to action. Globally, nurses are leading this critical work.

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ORIGINAL ARTICLE

WILEY

Nurses as agents for achieving environmentally sustainable health systems: A bibliometric analysis

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Abstract

Aim: To analyse the current scientific knowledge and research lines focused on environmentally sustainable health systems, including the role of nurses.

Background: There seem to be differences between creating interventions focused on environmentally sustainable health systems, including nurses, and the scarcity of research on this topic, framed on the Sustainable Development Goals.

Methods: A bibliometric analysis was carried out, via three databases (Web of Science, Scopus and Pubmed), and the guideline recommendations were followed to select bibliometric data.

Results: The search resulted in 159 publications, significantly increasing the trends from 2017 to 2021 ($p = .028$). The most relevant countries in this area were the United States, the United Kingdom and Sweden. Also, the top articles were from relevant journals, indexed in Journal Citation Report, and the first and the second quartiles linked to the nursing field and citations ($p < .001$).

Conclusion: Education is key to achieving environmentally sustainable health systems via institutions and policies.

Implications for Nursing Management: There is a lack of experimental data and policies on achieving or maintaining environmentally sustainable health care systems, indicating that nurses have an important role and should be consulted and included in decision-making policies regarding sustainability in the health care systems.

KEYWORDS
bibliometrics, environment, environmental research, global health, health research policy, nursing

1 | INTRODUCTION

The environment is a determining factor in the well-being and health of the population, causing a negative impact when it is toxic or unbalanced (Kiang & Behne, 2021). Air and soil pollution, imminent climate change, the destruction of healthy ecosystems and the creation of ideal ecosystems for new microorganisms, such as the SARS-COVID-2 virus, among other factors, are reducing the quality of life and increasing mortality (Fields et al., 2021). From Florence Nightingale to the present, the environment makes it possible to improve the patient's disease process (Kiang & Behne, 2021). Still, if it is damaged or contaminated, it can even harm it in the short- and long-term health (Fields et al., 2021).

Health systems are one of the more significant industries that consume a tremendous amount of water, food, plastic materials and energy (Fields et al., 2021). World Health Organization indicated in 2009 that the health sector might have one of the highest footprints linked to energy and material consumption (World Health Organization, 2009). Sustainable awareness and climate-friendly programmes can provide a high quality of care and reduce the production of waste, plastic and emissions (Kiang & Behne, 2021). The World Health Organization has promoted such programmes and interventions since the beginning of 2010 (General Assembly, 2011), but it was not until 2017 that a definition of environmentally sustainable health systems was given. Environmentally sustainable health systems are 'health system that improves, maintains or restores health, while minimizing negative impacts on the environment and leveraging opportunities to restore and improve it, to the benefit of the health and well-being of current and future generations' (World Health Organization, 2017). To achieve such a definition, the pillar is the integration of health care workers, especially nurses, since they are the primary health care workforce (Álvarez-Nieto et al., 2022). Diverse authors have highlighted the vital role of nursing in climate change, their relevance in the Sustainable Development Goals, especially Goal 3, and the importance of nursing education in the environmental awareness framed in Goal 4 (Anåker et al., 2015).

The education in sustainability and its awareness among nurses have been described as pillars to mitigate the negative impact of pollution on people's health (Leffers et al., 2017), being entangled in all 17 Sustainable Development Goals (Anåker & Elf, 2014; Kearns & Kearns, 2021; Kitt-Lewis et al., 2020). Therefore, nurses are engines of change in the current health system regarding environmental sustainability through research, and projects are integrated to achieve it (Lilienfeld et al., 2018; Richardson et al., 2016). Recent research indicated a scarcity of research focused on nurses and environmentally sustainable health systems (Osingada & Porta, 2020). Additionally, this pandemic has increased hospital waste and disposal and unsustainable options, limiting the sustainable policies instituted (Sarkodie & Owusu, 2021). There seem to be differences between creating interventions focused on environmentally sustainable health systems, including nurses (Álvarez-Nieto et al., 2022; Osingada & Porta, 2020) and the scarcity of research on this topic (Sarkodie & Owusu, 2021).

Based on these discrepancies, it is necessary and appropriate to investigate how this revolution toward environmental sustainability is going and what nurses' role as agents is to create environmentally sustainable health systems. The objective of this research was to analyse the current scientific knowledge, and research lines focused on environmentally sustainable health systems, including the role of nurses during this last decade. Also, a secondary objective was to determine the nursing education and interventions to improve the environmental awareness among them.

2 | METHODOLOGY

2.1 | Research structure

Bibliometric analysis has been used in nursing to analyse meta-approaches and data research (Kokol, 2021). Nonetheless, only one bibliometric analysis includes some ideas about the sustainability in the health sector and the role of nurses (White et al., 2014). Therefore, the current research was structured to cover this topic following the workflow described by Aria and Cuccurullo (2017): first, the research design, which included the research questions (research questions according to Zupic & Čater, 2015); second, the selection of the bibliometric and visualization section (SPSS program and Vosviewer); and third, the compilation of the bibliometric data (via three major databases in health: Scopus, Web of Sciences and PubMed), analysis (bibliometric analysis and use of programmes), visualization and interpretation.

2.2 | Data gathering

The research questions proposed were as follows:

> **Research Question 1.** Which are the publication trend and differences from the definitions of the World Health Organization?
>
> **Research Question 2.** Which countries and journals contribute to this field, and what is their relationship?
>
> **Research Question 3.** Which are the top publications and authors focused on interventions to obtain environmentally sustainable health systems and the inclusion of nurses?
>
> **Research Question 4.** How did the research focus and major topics evolve in the timeframe?
>
> **Research Question 5.** What influence of nurses have as agents and based on their workforce in the sustainability of health care systems?

Based on these research questions, the research strategy followed the population, intervention, comparison and outcome structure, which led to selecting the keywords and medical subject heading. The research strategy was formed by search strings: 'Sustainability', 'Nursing' and 'Environment' and a time limit of 10 years.

The review's inclusion criteria were articles indexed in the databases that contained some of the keywords from the thematic area of nursing. The exclusion criteria were other thematic areas and documents focused on different systems and health care workers and not framed in the World Health Organization's definition.

An initial search carried out in September 2021 using 'nurse' and 'sustainability' identified 1112 from Scopus and Web of Science databases. The results were reduced after the double peer revision from researchers, leaving 87 articles that would provide information on the topic. Based on the scarcity, the final research implemented in January 2022 was TITLE-ABS-KEY (nurs* AND environment* AND sustainable) in Scopus; TS = (nurs* AND environment* AND sustainable) in Web of Sciences and ((nurs*[Other Term]) AND (sustainable[Other Term])) AND (environment[MeSH Terms]) in PubMed.

After applying the time limit, 852 documents were obtained in Scopus, 677 papers in Web of Science, and 19 in PubMed, exported in an excel and bibliographic format (.csv and .enw) to be reviewed in the Endnote program (Clarivate Analytics, London, UK). The documents' details included author(s), affiliation, type of publication, title, abstract, keywords, year of publication, language and the number of citations. Further searchers were implemented in other databases (Google Scholar and Dialnet) using the exact search string. Finally, grey literature relevant to the topic (conference papers) was included (Figure 1).

The selection of the documents for the quantitative analysis followed the PRISMA recommendations (Page et al., 2021). Two researchers screened the documents' titles, abstracts and keywords. During the analysis, 468 documents were eliminated since they focused on unrelated topics, such as fishing, biodegradation of waste or microplastic in the oceans. Also, 450 documents were not included since they focused on environmentally sustainable systems. Finally, 159 papers related to the nurses and sustainability in the health system environment (Figure 1).

2.3 | Trend and association analysis

After obtaining all the data structured in the csv. format using the Excel version 17 (Microsoft Corporation, Redmond, Washington, USA), SPSS program version 28 (IBM Corporation, Armonk, NY, USA) and VOSviewer version 1.6.15 (Ness Jan van Eck, Netherlands) were used to determine significant differences, citation analysis and mapping and networking.

The data analysis was qualitative (mapping the items and checklist of the publications) and quantitative (statistical analysis). The qualitative analysis of the maps to identify the thematic and semantic structure of the scientific domain, visualizing its relationships with other keywords, completed with a manual and critical selection for the final filtering of the keywords, eliminating those that had to be with different themes such as stressful work environments or burnout. The checklist implemented was the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) and Enhancing the Quality and Transparency Of health Research (EQUATOR).

The quantitative analysis included metrics (Journal Citation Report, quartile and Journal Citation Indicator of the year 2020 and the year of publication) and details of the documents, such as the count of cites according to PlumX Metrics. The research results were analysed using descriptive analysis, such as the frequency of
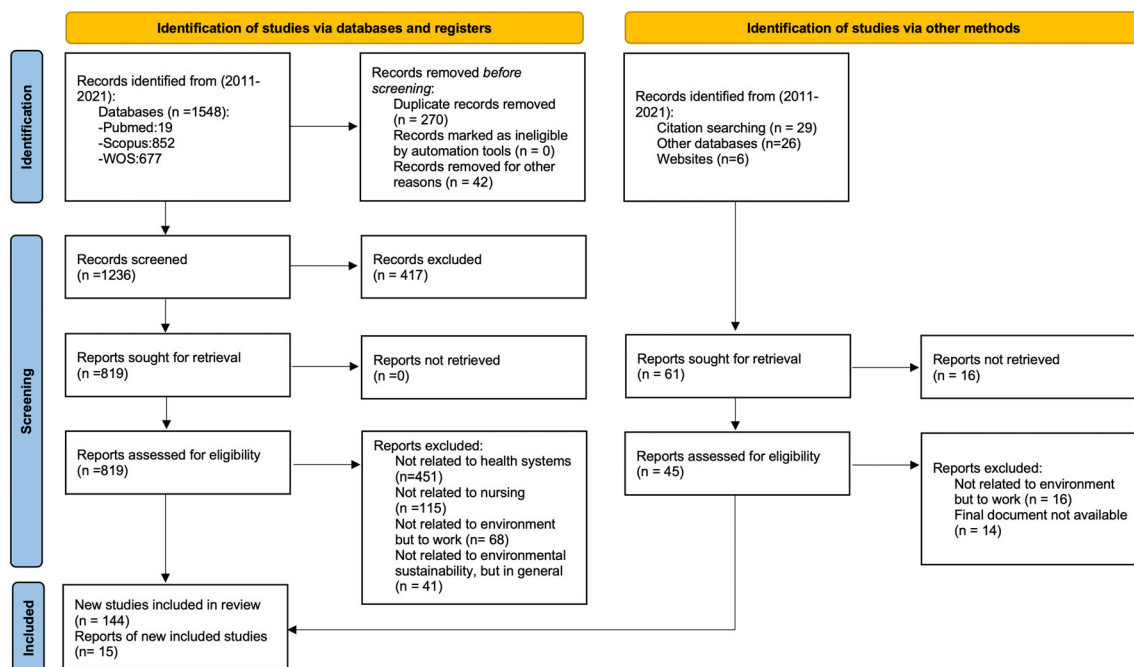

FIGURE 1 PRISMA 2020 flow diagram for systematic reviews. WOS, Web of Science

publications per country. The nonparametric tests (Kolmogorov–Smirnov $p < 0.001$) were used according to the variable, such as the Mann–Whitney test or Spearman's correlation.

2.4 | Ethical considerations

This research is framed on PhD research called "The Nursing Responsibility in the Environmental Sustainability" and framed on the Biomedicine Programme, receiving the ethical approval from the regional hospital (no. 267, ref. 3605). This research did not use patient data, with the information being available on databases. Nonetheless, the research respects the principles of Bioethics of the Oviedo Convention, the Helsinki Declaration and the current Spanish Data Protection Laws (5/12/2018).

3 | RESULTS

Table 1 shows the frequency of academic publications related to the environmentally sustainable health sector, including the role of nurses. The trend of publications indicated that the change occurred in 2017, being the most prolific researchers in 2019 and 2020. Additionally, the median of the year of publication was set in 2018, which matched the more substantial number of publications. From 2011 to 2021, the most published documents were articles (originals 81.10% and reviews 5.69%) being no significant differences according to the year of publication ($p > .05$). These documents were mainly from the United States (32.08%), followed by the United Kingdom (10.69%). They were most of them published in indexed journals (Table 1), being independent of the year of publication ($p > .05$). This trend of publication seemed to be associated with the number of citations ($p < .001$), being more relevant than the difference between the 2017–2021 (value = 44.49; $p = .028$) and the Journal Citation Report of the year of publication ($p = .046$).

The countries with a higher number of publications and higher number of citations were the United Kingdom (number of publications = 10.7% and 8.25 ± 14.29 cites; IC at 95% 0.64–15.68), the United States (number of publications = 32.1%; 5.92 ± 6.98; IC at 95% 3.95–7.89), Australia (number of publications = 8.8%; 3.78 ± 3.31; IC at 95% 1.86–5.69), Spain (number of publications = 6.9%; 6.0 ± 9.49; IC at 95% 0.38–12.38) and Sweden (number of publications = 5.0%; 11.25 ± 17.87; IC at 95% −3.69–26.19). The co-currency of countries indicated that there were four clusters formed by nine countries (Figure 2), with the first (red) constituted by the United States (48 documents and eight links) and Sweden (nine documents and eight links). The second (green) was constituted by Australia (20 documents and eight links) and Taiwan (three documents and three links). Meanwhile, the third was formed by the United Kingdom (23 documents and seven links) and Spain (16 documents and seven links), and the fourth was formed only by China. The comparison between the countries and associations between these was related to the number of cites ($p = .006$), with the differences being more significant between the countries with fewer publications, such as France (2.5%), compared with the United States (value = 36.34; $p = .001$), which was also associated with the Journal Citation Indicator in 2020 ($p = .021$).

According to the cites, the relevance of these countries in this topic is also reflected by the top 10 articles (Appendix S1). Appendix S1 shows how the most relevant investigations (7/10) were published in the top countries (Figure 2), which were also co-writing the results (3/10). Most of the studies were reviews (6/10), from systematics and scoping to scientometrics, followed by original studies, qualitative (2/10) and observational (2/10). The quality of the studies based on the checklists indicated that the qualitative analysis had higher methodological quality than the observational studies (Anåker et al., 2015, had 93.75% while Richardson et al., 2014, had 34.38%). The data (Table 2) indicated that the most relevant articles were published in 2013 or 2014, being their thematic area focused on education, Sustainable Development Goals and care. Only one of the top 10 articles

TABLE 1 The trend of publication on this topic and differences regarding the type of publication, the affiliation of the author, indexed in Journal Citation Report and Quartile (Research Question 1)

Year of publication	Frequency	Type of documents	Country	Indexed at Journal Citation Report	Quartile
2011	1.3%	Articles 86.8% $p = .91$	The United States of America (USA) 32.1% $p = .28$	Indexed 61.0% $p = .17$	Quartile (Q1–Q4) 61.6% $p = .28$
2013	1.3%				
2014	3.8%				
2015	5.0%				
2016	8.8%				
2017	13.1%				
2018	8.8%				
2019	15.6%				
2020	24.4%				
2021	18.1%				
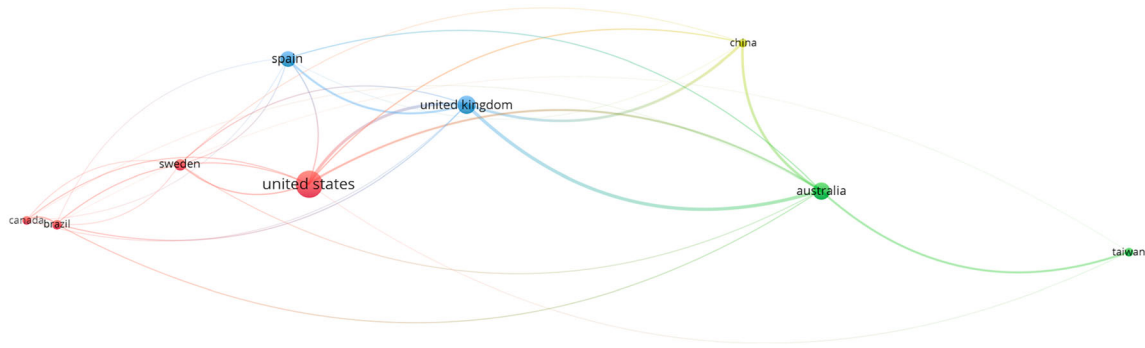
FIGURE 2 Co-currency of countries based on bibliographic coupling with a maximum of 25 documents and a minimum of five (Research Question 2)

TABLE 2 Top 10 authors published in the topic, with h-index, citations and total publication

Author	Publications on the topic	h-index	Total citations	Total publications	First publication	Affiliation	Author ID
Rosa W.E.	11	12	511	123	2014	United States	56194379200
Grose J.	4	11	394	30	2012	United Kingdom	55226482400
Richardson J.	3	46	7094	200	1993	United Kingdom	35500478000
Beck D.M.	3	5	80	19	1998	Canada	15761985500
Cunha I.C.K.O.	3	9	323	79	1995	Brazil	7003935865
Elf M.	3	16	699	59	2001	Sweden	23008276300
Dossey B.M.	3	11	358	68	1993	United States	7004496398
Anåker A.	2	7	173	12	2004	Sweden	56056321800
Furukawa P.d.O.	2	3	37	6	2010	Brazil	36463381900
Marck P.B.	2	16	738	62	1993	Canada	6701740195

was in sync with the definition of an environmentally sustainable care system (Dossey et al., 2019). However, other authors indicated the relevance of sustainability in health systems, including hospitals or primary care.

The top five articles regarding the cites (Table 2) were carried out in Sweden, International collaborations (the United Kingdom, Brazil, Belgium, Ghana and Australia), the United Kingdom, and the United States. These results were published from 2013 to 2019, most of which were among the top 10 from 2014. Moreover, this table also indicated how the top articles were from relevant journals, indexed in Journal Citation Report, and the first and the second quartiles linked to the nursing field and linked to the number of cites ($p < .001$).

A further analysis was carried out based on the dominant authors on this topic (Research Question 4). The top five authors (Table 2) who focused on this subject during the last decade were also from the leading countries and collaborated among them (Figure 3). The mean of the h-index of the top 10 authors was 13.6 ± 12.1, the mean of citation 1040.7, and a mean of 65.8 documents. The principal authors were from the United States (Rosa W.E. and Dossey B.M.), the United Kingdom (Grose J. and Richardson J.) and Sweden (Elf M. and Anåker A.), followed by Brazil (Cunha I.C.K.O. and Furukawa P.d.O.) and Canada (Beck D.M. and Marck P.B.).

Rosa W.E. tops this field with 11 documents during the last decade, with 123 publications mainly in the area of *Dental Practice*; *Delivery of Health Care* and *Environmental Sustainability*, followed by Grose J., who also published in the same area as Rosa W.E.

Nonetheless, the author with the h-index is Richardson J. (h-index of 46), Elf M. with an h-index of 16, Marck P. B with an h-index of 16 and the fourth Rosa W. E. with an h-index of 12 (Table 2). The top published on this topic started to publish in 2012 and 2014, also connected among the authors (Figure 3).

The connection of the authors, based on co-citations, indicated that the top authors were cited between them (Figure 3). The co-citation of the authors pointed out that there were clusters among the authors, with the first (red) constituted by 14 authors, led by Richardson J. (citations = 38, links = 25), Grose J. (citations = 26, links = 25), Anåker A., (citations = 24, links = 24) and Elf M. (citations = 23, links = 24). The second cluster (green) is formed by 11 authors, led by Rosa W.E. (citations = 34, links = 21) and Dossey B.M. (citations = 34, links = 19). The last cluster is formed by three authors, led by Haines A. (citations = 19, links = 26), whose h-index is 85, but mainly published on *Climate Change*; *Rockefeller Foundation*; *Malnutrition*, including Gonzalez-Garcia S. from Spain (12 citations and h-index of 41). These results indicated that most connections were
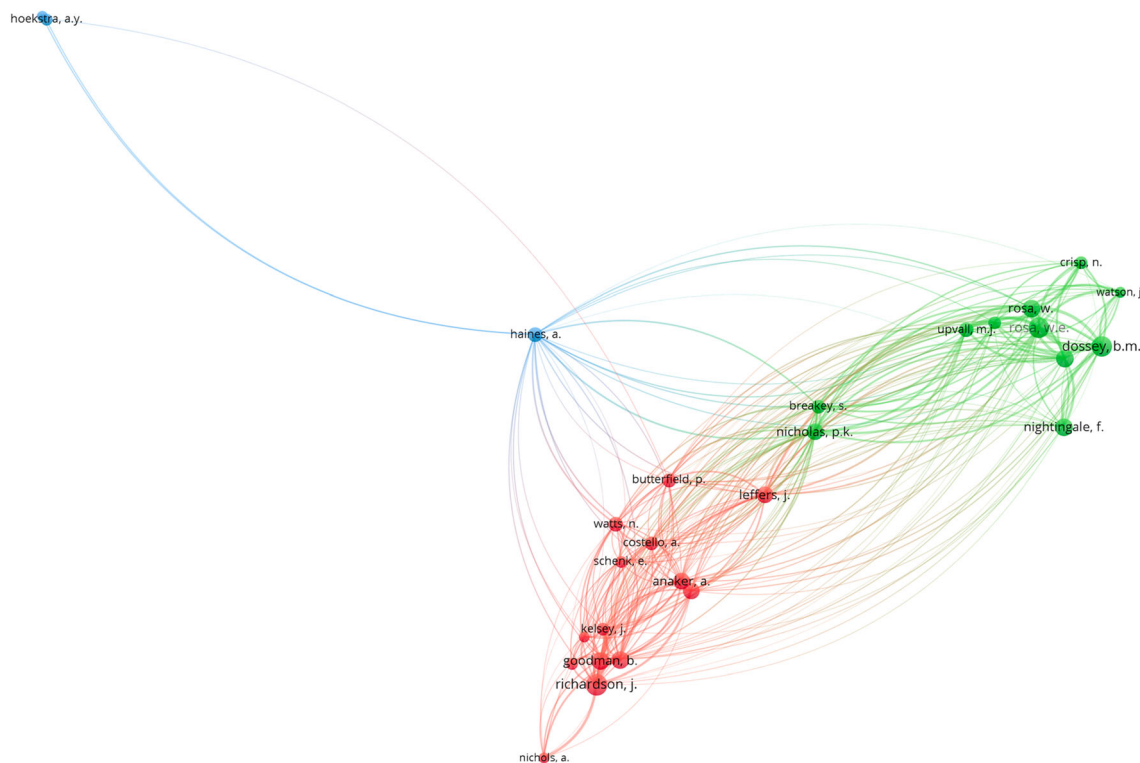
FIGURE 3 Connections between authors based on co-citation with 25 documents and a minimum of 10 (Research Question 4)

established between researchers from United States, United Kingdom, Sweden and Spain (Research Question 4).

Finally, the keyword analysis was carried out to determine the current lines of research on this topic (Research Question 5). Four clusters were identified that include 80 keywords represented by red (first with 28 keywords, 1108 links and 271 occurrences), green (second with 24 keywords, 875 links and 182 occurrences), blue (third with 17 keywords, 687 links and 261 occurrences) and yellow (11 keywords, 476 links and 110 occurrences) (Figure 4). The first cluster was led by the keywords 'organization and management' (65 links and 20 occurrences) and 'nursing education' (59 links and 23 occurrences). This cluster represented one of the main topics based on sustainable education, including the training, curricula and competencies. The second, including the terms 'nurses' (71 links and 26 occurrences) and 'waste management' (45 links and nine occurrences), highlighted the subtopic of the nursing profession and nursing discipline in environmental sustainability. The cluster focused on primary health care responsible for preventing this impact through health promotion and prevention of diseases related to environmental environments and pollutants. The third cluster had significant terms 'sustainable development' (73 links and 52 occurrences) and 'United Nations' (40 links and 25 occurrences). This cluster is based on environmental sustainability through protection and prevention of its impact, for example, through the waste that is generated or the essential elements of nature in the environmental sustainability of Florence Nightingale. The last cluster, whose leading keywords were 'environmental protection' (61 links and 17 occurrences), 'education'

(51 links and 12 occurrences) and 'organization' (46 links and 10 occurrences), focused on health policy to maintain the environment. This cluster highlighted the relevance of education and policies to preserving the ecosystem and achieving environmental health.

4 | DISCUSSION

This study aimed to determine the current scientific knowledge and research lines focused on environmentally sustainable health systems, including the role of nurses during this last decade, and to choose the nursing education and interventions to improve the environmental awareness among nurses.

The trend of publication, major countries and connections between them, the most relevant authors and what are the topics more analysed by the authors indicated associations between countries, the importance United Nations' recommendations (General Assembly, 2011) and the most relevant topics.

First, the trend analysis indicated that the period with a higher number of publications is from 2017 to 2021, despite a slight decrease during 2021. This trend matched the inclusion of nursing in the sustainability (Benton & Shaffer, 2016) and environmentally sustainable health systems' definition (World Health Organization, 2017). This tendency also matches previous bibliometric analyses that indicated how nursing had grown exponentially during the last decade (Kokol, 2021). There are more reviews on this topic (Lilienfeld et al., 2018). Nonetheless, the Covid-19 has impacted this research
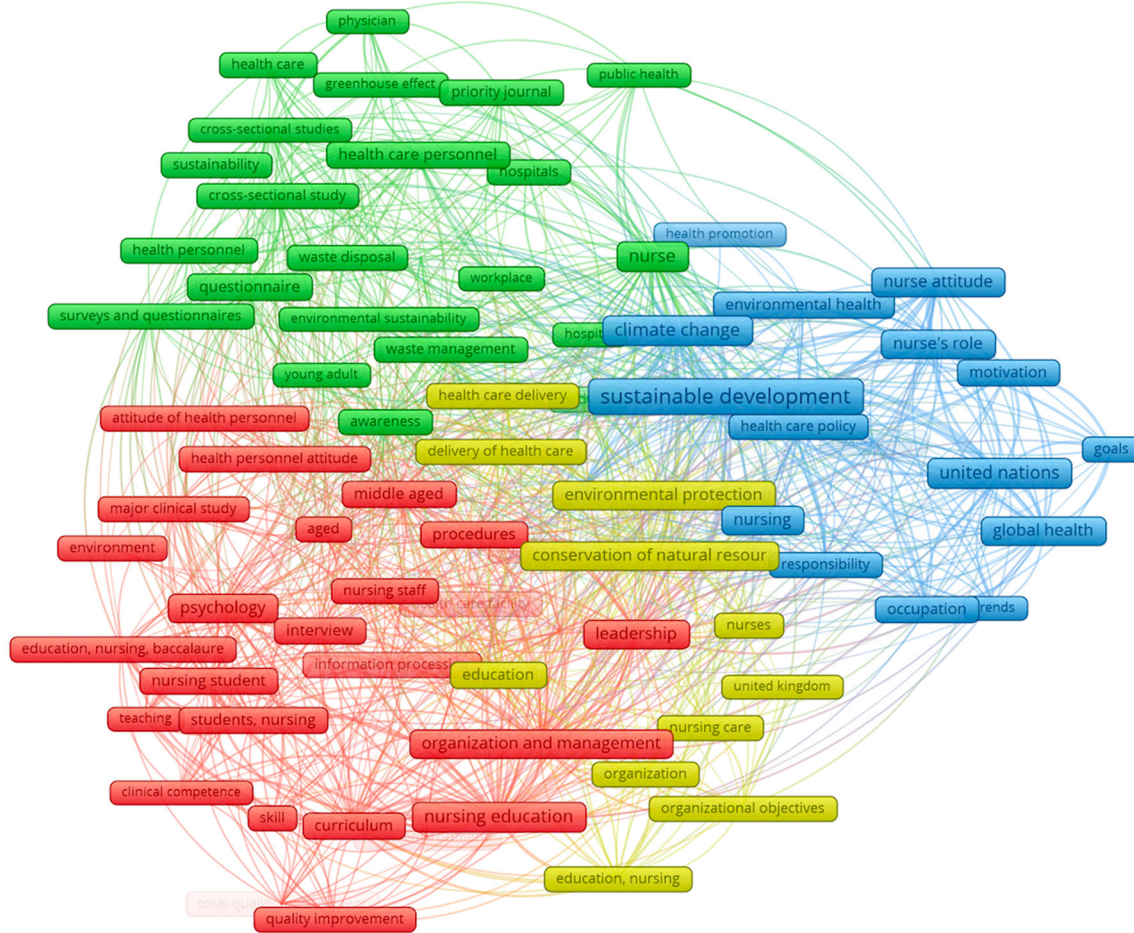
FIGURE 4 Co-occurrence of most common index terms per document with a minimum of five connections. *Note*: Words unrelated to the topic were eliminated (human/s, article, gender, adult and human experiments) (Research Question 5).

since there was a decrease from 2020 to 2021, which could be explained by the findings of Osingada and Porta (2020). Their results stated how the pandemic had impacted this field and even reduced the number of available publications.

Besides, most of the publications were from Northern countries, interconnected among themselves. These results are consistent since these major countries are the geographical base of diverse international organizations, such as the United Nations.

Analysis of the top 10 publications, mainly carried out in such countries and by the 10 top authors like Anåker or Richardson, focused on the role of nursing in diverse areas but was highly repetitive about the relevance of the education and their role in Sustainable Development Goals. Also, it reflected the lack of original studies framed on the definition (World Health Organization, 2017) and the role of nurses in obtaining it, which is understandable since the definition is recent. The articles introduce the idea of environmentally sustainable health systems and the role of nursing in improving awareness. However, empirical data were missing on how to achieve such awareness and environmentally sustainable health systems. One example of this lack of empirical data and the reviewing of the nursing role is the article published by Dossey et al. (2019). This publication

(Dossey et al., 2019) highlighted education in sustainability as critical, especially for Goal 3, but the authors do not present a unified action to achieve it.

In this sense, Yakusheva et al. (2022) highlighted the need for value-informed decision-making to achieve environmentally sustainable health care systems. Only one of the articles, even published after 2017 (Dossey et al., 2019), presented the idea, achieving it through education (Lilienfeld et al., 2018; Rosa et al., 2019). Most of the top ten articles indicated the high relevance of education nurses as agents to integrate, framed the Sustainable Development Goals, and create environmentally sustainable health systems.

Moreover, from the analysis of the keywords, it can be concluded that the role of nursing in this topic is diverse but that it focuses on education, organization and management, policies to maintain or create an environmentally sustainable system. Also, the analysis indicated that the organizations, mainly United Nations, and their reports or recommendations, mainly the Sustainable Development Goals, are essential to nurses as guides to incorporate actions and measures to be effective agents, which were also patent in different works of the top 10 publications (Benton & Shaffer, 2016; Kurth, 2017; Pettigrew et al., 2015).

4.1 | Limitations

The study's main limitation is the selection of the keywords, which was tried to be mitigated by including three databases and a follow-up of the PRISMA declaration carried out via a double peer screening. Additionally, the analysis was focused on the quantitative analysis, reducing the qualitative results to the top 10 articles.

5 | CONCLUSION

The bibliometric analysis indicated that research in environmentally sustainable health care systems is currently more theoretical. The research literature told how nurses are pivotal to the environment. Still, there is a lack of publications that analyse on this topic.

Nursing education is key to achieving it, being relevant in organizations, management and policies integrating high quality education so nurses can be active and positive agents in creating and maintaining environmentally sustainable health care systems.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

The current research presents a bibliometric analysis that explores the role of nursing in environmentally sustainable health care systems relevant to Sustainable Development Goals, highlighting the importance of education and policies that include nurses. Global collaborations were identified in the current research, highlighting the role and connections between the major authors' countries and how these countries have relevance in major institutions. However, there is a lack of experimental data and policies on achieving or maintaining environmentally sustainable health care systems, indicating that nurses have an important role and should be consulted and included in decision-making policies regarding sustainability in the health care systems. Additionally, to adequate management and policies, nursing education continues to be vital in achieving sustainability and, therefore, the Sustainable Development Goals. Therefore, continuous training should be included for nurses.

The findings are exciting since this is the first bibliometrics analysis to identify the role of nursing in achieving environmentally sustainable health care systems. The findings indicated that there is a need for further original publications on this topic and this would happen during the decade of Agenda 2030, and education is key and should be included in the diverse institutions and policies created.

CONFLICT OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

ETHICS STATEMENT

This research is framed on PhD research called 'The Nursing Responsibility in the Environmental Sustainability' and framed on the Biomedicine Programme of IMIBIC and University of Cordoba, receiving the ethical approval from the regional hospital (no. 267, ref. 3605). This research did not use patient data, with the information being available on databases.

DATA AVAILABILITY STATEMENT

Authors do not wish to share the data.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

ORIGINAL ARTICLE

WILEY

Density of nurses and midwives in sub-Saharan Africa: Trends analysis over the period 2004–2016

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Abstract

Aim: To analyse the trends of density rates of nurses and midwives per population in sub-Saharan Africa over the period from 2004 to 2016.

Background: Nursing, the largest health care workforce, is actively contributing to the achievement of the Sustainable Development Goals. The African continent is one of the most affected areas by the differences in the density of nurses and midwives indicator.

Methods: Joinpoint regression analysis was applied to identify significant changes in trends of the density of nurses and midwives from the 50 countries of sub-Saharan Africa.

Results: From 2004 to 2013, the density of nurses and midwives in sub-Saharan Africa increased significantly from 5.6 to 12.44 per 10,000 population, although it exhibited a increasing trend of a magnitude of 8.3% until 2013 that does not continue from that year.

Conclusions: Only seven countries show an increasing trend, although in the case of the rest, they do not present any trend that suggests a change in this indicator in the short term.

Implications for Nursing Management: From a macrolevel nursing management point of view, our study shows the importance of implementing actions that contribute to the increase of the nursing workforce in Africa, essential to achieve the Sustainable Development Goals.

KEYWORDS
joinpoint regression analysis, midwives, nurses, ratio, sub-Saharan Africa

1 | BACKGROUND

Member states of the United Nations (UN) General Assembly adopted in 2015, 17 Sustainable Development Goals (SDGs), calling on all countries to end poverty, redress inequality, and undertake climate change by 2030, with health as the common thread linking all SDGs (UN, 2018). Nursing, the largest health care workforce, is actively contributing to achievement of the SDGs through practice, research, education and policy (Porta et al., 2019).

Nurses are distinguished for providing direct attention to the population and for leading health education strategies, contributing to public health through the prevention of disease and the promotion of community health and, therefore, improving the overall health of the population (Guilamo-Ramos et al., 2021). Furthermore, nursing practice has a great influence on the SDG, which is considered social determinants of health, as those related with education and poverty, because of its impact on people's health conditions and quality of life (International Council of Nursing [ICN], 2017). In this regard, the report 'Triple Impact of Nursing' (All-Party Parliamentary Group on Global Health, 2016) stated that increasing the number of nurses will have the wider triple impact of improving health, promoting gender equality and supporting economic growth.

The number of nurses and midwives in each country is monitored with the help of an indicator called 'density of nurses and midwives'. This indicator refers to the number of nurses and midwives per 10,000 population in a given national area (World Health Organization [WHO], 2018a). Health worker density is one of the indicators described in the WHO Global reference list of 100 core health indicators and is designated as an indicator for the SDG 3 (WHO, 2018b). Measuring and monitoring the density of health care workers are crucial for understanding the available resources in a health system, identifying the reality of each region in addition to determining the potential improvement of health service conditions.

Despite there is no defined standard to establish an acceptable level of density of nurses and midwives, the WHO reported that "countries with less than 23 health care professionals per 10,000 population don't reach adequate coverage rates" (WHO, 2009, p. 95). According to this report, the average worldwide is 28 nurses per 10,000 inhabitants, ranging from just 11 per 10,000 population in the African Region to 79 in the Europe Region. The latest figures reported by WHO show that more than 55% of the member countries have less than 40 nurses per 10,000 population. However, about 23% of these countries have less than 10 nurses per 10,000 population. Estimates for 2030 rely on the decline in the shortage of nurses (from 9 to 7.6 million), except in African and Eastern Mediterranean Regions where they will get worse (WHO, 2021).

The African continent is one of the most affected areas by the decline of health care workforce and particularly of nurses (Drennan & Ross, 2019). According to the latest available data, the most predominant situation is countries with densities below 20. The sub-Saharan Africa region encompasses, for the most part, countries with densities below 10 nurses per 10,000 inhabitants. Today, numerous countries in this region present values below five, and even

countries with densities close to one nurse per 10,000 inhabitants can be found, and that despite the national strategic plans for human health resources approved in these countries (Afriyie et al., 2019).

Applying standardized methodologies to determine the density of nurses and midwives in sub-Saharan Africa may offer data to analyse this issue in greater depth. However, to date, no studies have examined this aspect using standardized methodologies. Therefore, the aim of this study was to use official data to analyse the trends in density rates of nurses and midwives per population ratio in sub-Saharan Africa over the period from 2004 to 2016.

2 | METHODS

The data were extracted from the WHO statistical data which is generated by African Health Statistics website (African Health Stats, 2019). The data compilation was carried out from routine administrative information systems, population censuses and health facility assessments. The database was updated on 14 March 2019.

We used data from nurses and midwives per 10,000 population (NPP) rates from the 50 countries of sub-Saharan Africa over the period 2004–2016. The study of the trends included 12 countries of this region, because we needed countries that had records for a minimum of 7 years in order to estimate their trends. These countries were Burkina Faso, Gambia, Mali, Nigeria, Ethiopia, Madagascar, Mauritius, Seychelles, Kenya, Mozambique, Botswana and South Africa. For each of these countries, available data included 7 or more years for the period under analysis. For the other countries of sub-Saharan Africa, we only presented data collected from WHO, but we could not include them in the individual trend analysis.

Adhering to WHO methodology, NPP rate was defined as the amount of the number of nurses and midwives during the year expressed per 10,000 inhabitants. The median of nurses and midwives per 10,000 population was calculated for all the data of each year and each country and for all countries of Africa with the objective to acquire a global idea of the trends during the study period of the whole region.

Furthermore, additional analyses was conducted to examine NPP trends dividing sub-Saharan Africa into four geographical regions: West Africa (Benin, Burkina Faso, Cape Verde, Ivory Coast, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo and Mauritania); Central Africa (Angola, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon and Sao Tomé & Principe); East Africa (Ethiopia, Eritrea, Djibuti, Somalia, Madagascar, Mauritius, Comoros, Seychelles, Uganda, Kenya, Burundi, Tanzania, Sudan, Mozambique, Malawi, Zambia and Zimbabwe); and Southern Africa (Botswana, Lesotho, Namibia, Eswatini [previously Swaziland] and South Africa). South Sudan, Eswatini and Rwanda were excluded from these analyses due to the lack of data for these countries. We did not impute or extrapolate missing data.

Joinpoint regression analysis was used as the statistical method to analyse significant changes in NPP trends. These analyses identified

inflection points (called 'joinpoints') at which there were significant changes in the slope of the linear trend (Kim et al., 2000). To determine the number of joinpoints (from zero joinpoint, representing a straight line, to a maximum of four joinpoints), a series of permutation tests with Bonferroni adjustment were used to control the error probability of each of the multiple tests. In this analysis, the NPP rate was the dependent variable, and the year was the independent variable. On the other hand, to determine the annual percent change (APC), which described the magnitude of the change for each of the identified trends, and the average annual percent changes (AAPCs), which describe the average APC over the 2004–2016 interval, a log-lineal model is used. For each APC and AAPC the corresponding 95% confidence intervals (95% CIs) were calculated. Statistical significance was defined as a p value smaller than .05 in all the analyses. All the analyses were carried out using Joinpoint regression software (version 4.6.0.0) developed by the National Cancer Institute, USA.

3 | RESULTS

Data of NPP in sub-Saharan Africa and the studied countries are shown in Table 1.

The NPP rates were significantly higher in South Africa, Seychelles, Mauritius, Botswana, and Namibia, with a ratio greater than 24 nurses and midwives per 10,000 population in all included years. As more unfortunate countries, those with lower ratios were Somalia and Madagascar with less than three nurses and midwives per 10,000 population in all included years.

3.1 | Analysis of the density of nurses and midwives in sub-Saharan Africa

During the study period, there was a statistically significant trend in NPP in sub-Saharan Africa with one identifiable joinpoint (Figure 1). From 2004 to 2013, the NPP ratio in sub-Saharan Africa increased significantly from 5.6 to 12.44 per 10,000 population (APC = 8.3%; 95% CI from 3.4% to 13%), although the APC exhibited a declining trend not statistically significant from 2013 to 2016 (APC = −14.6%; 95% CI from −33.5% to 9.8%).

3.2 | Analysis of the density of nurses and midwives by region

Among the different regions, the highest nurses and midwives rate per population was recorded in Southern Africa in every year under study (mean = 37.62 nurses and midwives per 10,000 population), peaking in 2015 (50.39 per 10,000) as shown in Table 1. In contrast, the lowest rates were found in Central Africa (mean = 6.51 per 10,000) showing the lowest rate in 2012 (2.8 per 10,000).

As illustrated in Figure 2 and Table 2, in the period from 2004 to 2016, Southern Africa showed a significant increasing trend

(AAPC = 4.7%; 95% CI from 2.8 to 6.7). On the other hand, East Africa region presented an statistically significant joinpoint trend, divided in two slopes, the first increasing one from 2004 to 2013 (APC = 12.0% 95% CI from 4.2 to 20.0) and the second, decreasing one, from 2013 to 2016 (APC = −20.2%; 95% CI from −45.1 to 16). The Central Africa and the West Africa regions presented no statistically significant trends.

3.3 | Analysis of density of nurses and midwives by country

According to the individual country analysis (Table 3), eight of the 12 countries showed significant trends: Gambia, Nigeria, Ethiopia, Madagascar, Mauritius, Kenia, Botswana and South Africa. Data from Gambia (AAPC = 11.0%; 95% CI from 7.6 to 14.5), Kenya (AAPC = 14.6%; 95% CI from 3.2 to 27.6) and Botswana (AAPC = 1.8%; 95% CI from 0.6 to 3.0) in the 2004–2016 period revealed a no joinpoint increasing trend model but conversely, Madagascar showed a decreasing trend for the same period (AAPC = −6.0%; 95% CI from −8.3 to −3.7).

Nigeria presented a significant joinpoint with a negative trend from 2005 to 2009 period (APC = −5.0%; 95% CI from −6.4 to −3.6) and the second segment (2009–2013) with a positive trend (APC = 2.9%; 95% CI from 1.2 to 4.7). Ethiopia also presented a significant joinpoint with a positive trend with an abrupt increase from 2008 to 2016 period (APC = 18.7%; 95% CI from 13.3 to 24.3). In the analysis made for Mauritius, a significant joinpoint included a first decreasing period from 2004 to 2008 (APC = −8.3% 95% CI from −9.8 to −6.8) and a second increasing period from 2008 to 2015 (APC = 3.5%; 95% CI from 2.8 to 4.2). Similarly, NPP in South Africa fitted to one joinpoint model. The APC for the first period from 2004 to 2014 was 2.7% (95% CI from 2.6 to 2.8) and 1.7% (95% CI from 0.4 to 2.1) for the second period (2014–2016) (Figure 3).

The rest of the countries did not satisfy the significance level; that is, there were no periods when the NPP rate changed significantly.

4 | DISCUSSION

This study shows that although the number of nurses and midwives in sub-Saharan Africa has increased from 2004 to 2013, there is not a trend that will continue from 2013. This absence of increase of recent years is not in line with the need manifested at the international level in relation to health care workforce in sub-Saharan Africa. Although 11% of the world's population live in this region, its health spending is less than 1% of the world's financial resources on health and it only counts on 3% of the global health workforce (Anyangwe & Mtonga, 2007).

The Southern Africa region is undoubtedly the one with the most advantageous situation within the continent, not only because it has the highest ratios but also because it is the only one that shows a growing trend, although moderate. The rest of the regions

TABLE 1 NPP ratio by country

Region	Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Region	West Africa	4.99	5.07	10.04	6.16	4.51	6.72	7.77	5.08	6.8	12.64	8.99	8.82	5.70
	Benin	7.74				8.20				6.8	6.32			6.14
	Burkina Faso	5.03				3.71	4.04	5.54	5.56	6.31			2.40	5.70
	Cape Verde						9.98	10.80	10.68	10.72	11.42		12.27	
	Ivory Coast	5.66	4.90			4.73			4.65			8.52		
	Gambia	4.96	5.06	5.05	8.20	8.88				13.80				
	Ghana	9.39				9.80	10.44	9.18			15.91		16.29	15.49
	Guinea	4.64												3.84
	Guinea-Bissau	7.93				6.43	6.86		5.50					
	Liberia	3.25				2.67		4.57					1.01	
	Mali	6.72			2.10		4.43	4.45	3.67	3.76				3.82
	Niger	2.14				1.38	2.04				2.41	3.10		
	Nigeria		15.36	15.02	14.98	14.96	10.76	13.56			14.52			
	Senegal	3				4.30			2.76		13.85	9.96	7.75	3.13
	Sierra Leone	4.61				1.60		2.85	2.76					
	Togo	3.50			4.12	2.94		14.43					2.98	
	Mauritania	6.22					6.56	7.76				9.46	9.89	10.34
Region	Central Africa	7.24	5.39	6.76	6.63	4.43	4.10	6.27	13.38	2.8	2.89		11.32	6.96
	Central African Republic	3.97				1.92	2.49						2.04	
	Chad	2.57		1.81						2.80	3.08			3.63
	Dem. Rep. of Congo						4.10				4.70			
	Angola	9.79					13.12							
	Cameroon	15.35	3.84		4.47		3.92	5.36	9.33					
	Ecuatorial Guinea	3.73												5
	Gabon	4.68												
	Congo	10.18		13.66	8.78				17.43					25.80
	Sao Tomé & Príncipe	20.26											20.60	
	Zambia		6.94	6.75		6.94	7.05	7.17						8.92
Region	East Africa	5.17	5.75	2.95	7.64	5.27	3.96	7.17	11.83	10.56	13.44	8.45	8.30	6.80
	Ethiopia	2.08	2.45	2.26	2.24	2.01	2.51							8.40
	Eritrea	6.49												
	Dyibuti	3.84	5.746									5.35		
	Somalia			0.90								0.61		

(Continues)

TABLE 1 (Continued)

	Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	Madagascar	2.85	3.50	3.02	2.94	2.81	2.43	2.23	2.17	2.17		1.05		
	Mauritius	37.87			26.74	27.43	28.13	28.84	29.33	29.81	31.57	32.81	33.83	
	Comoros	9.84	5.62				7.02			9.21				
	Seychelles	72	44	46	46	45		45		45				
	Uganda	6.88	13.18							11.35			6.30	
	Burundi	1.87						6.81						6.80
	Kenia	4.60				3.59	3.96	7.17	14.15	14.15	14.44	15.42		
	Tanzania	3.68		2.32						4.24		4.13		
	Sudan	10.44		10.55	10.06	9.84						12.06	8.30	
	Mozambique	3.04		2.88	5.21		3.84	3.92	3.81	3.92	4.01			4.43
	Malawi	5.73				2.73	3.27							2.52
	Zambia		6.94	6.75		6.94	7.05	7.17						8.92
	Zimbabue						12.06	12.08	11.83	10.56	12.43	11.54		
Region	Southern Africa	28.28	31.63	33.23	30.11	35.53	36.45	28.86	36.96	37.38	48.49	49.59	50.39	42.16
	Botswana	25.98	24.07	26.56	30.11	28.85	29.37	28.86	28.35	27.83				33.00
	Lesoto	5.855						6.50						
	Namibia	30.58			27.64									
	South Africa	38.23	39.17	39.89	40.88	42.21	43.51	44.79	45.57	46.93	48.48	49.58	50.39	51.31

FIGURE 1 Global trend in NPP rate in sub-Saharan Africa (2004–2016)
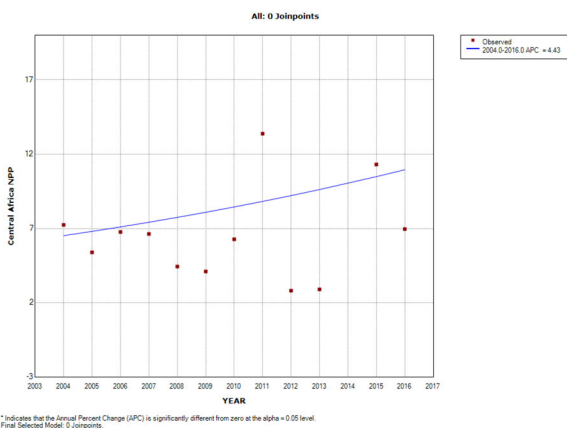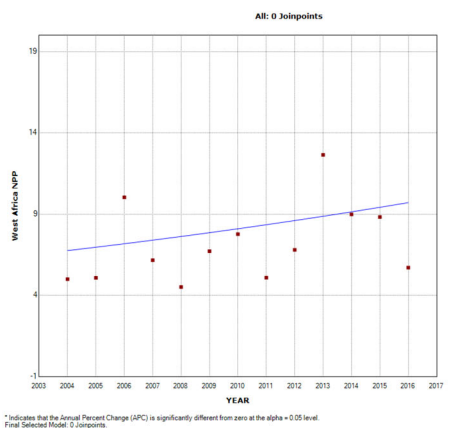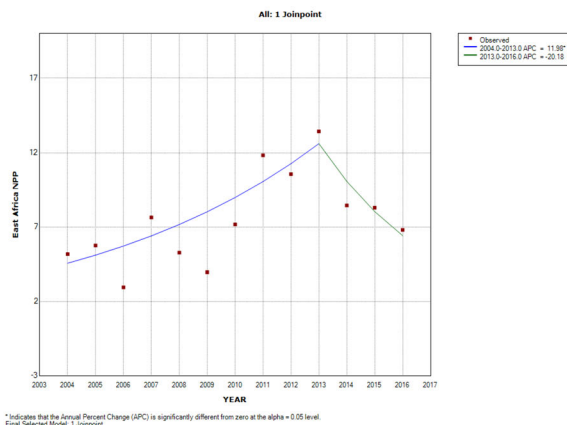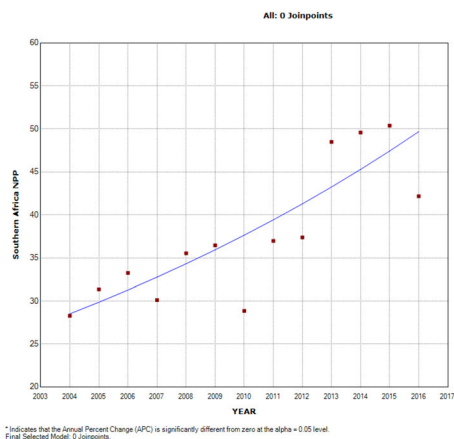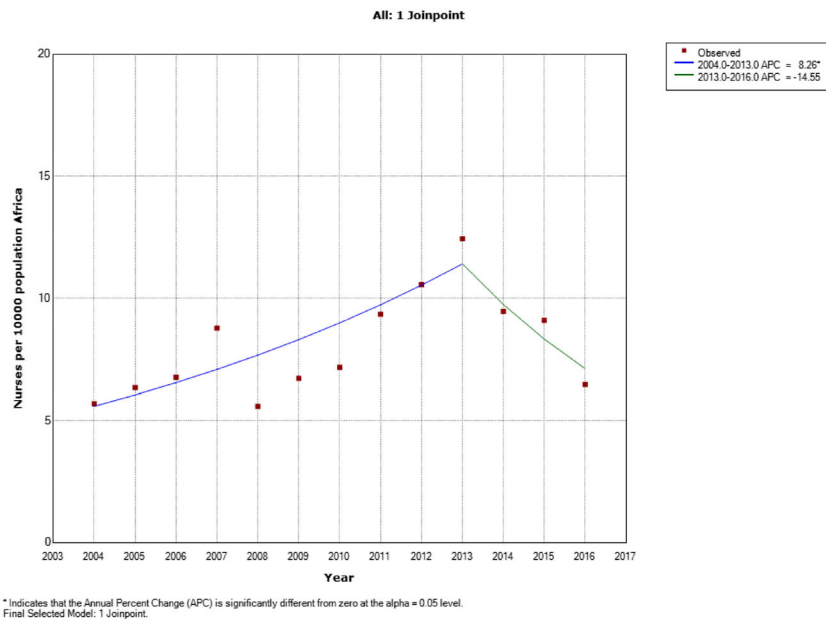
FIGURE 2 NPP rate trend in Southern Africa, East Africa, Central Africa and West Africa (2004–2016)

either do not show clear trends and remain unchanged (as in the case of Central Africa and West Africa) or show an increasing trend followed by a very marked decreasing trend from 2013 (East Africa). Therefore, these regions are in a situation of extreme vulnerability in relation to the nurses and midwives per 10,000 population rates.

TABLE 2 Joinpoint analysis of NPP rate trend per region in Sub-Saharan Africa (2004–2016)

	All study period		Trend 1		Trend 2	
	Range of Years	AAPC (95% CI)	Range of years	APC (95% CI)	Range of years	APC (95% CI)
Africa	2004–2016	**2.0 (−4.0 to 8.4)**	**2004–2013**	**8.3* (3.4 to 13.3)**	**2013–2016**	**−14.6 (−33.5 to 9.8)**
Southern Africa	2004–2016	4.74* (2.8 to 6.7)	—		—	
East Africa	2004–2016	**2.9 (−6.1 to 12.8)**	**2004–2013**	**12.0* (4.2 to 20.4)**	**2013–2016**	**−20.2 (−45.1 to 16)**
Central Africa	2004–2016	4.4 (−2.5 to 11.9)	—		—	
West Africa	2004–2016	**3.1 (−2.4 to 8.9)**	—		—	

Abbreviations: APC, annual percent change; AAPC, average annual percent change; CI, confidence interval.
*$p < .05$.

TABLE 3 Joinpoint Analysis of NPP rate trend per Country (2004–2016)

	All study period		Trend 1		Trend 2	
	Range of years	AAPC (95% CI)	Range of years	APC (95% CI)	Range of years	APC (95% CI)
Burkina Faso	2004–2016	1.31 (−4.3 to 7.2)	—		—	
Gambia	2004–2015	11.0* (7.6 to 14.5)	—		—	
Mali	2004–2016	−5.3 (−5.1 to 2.7)	—		—	
Nigeria	2005–2013	−1.3 (−5.1 to 6.8)	2005–2009	−5.0* (−6.4 to −3.6)	2009–2013	2.9* (1.2 to 4.7)
Ethiopia	2004–2016	14.1* (10.5 to 17.9)	2004–2008	−1.9 (−16.5 to 15.2)	2008–2016	18.7* (13.3 to 24.3)
Madagascar	2004–2014	−6.0* (−8.3 to −3.7)	—		—	
Mauritius	2004–2015	−0.4 (−2.8 to 2.1)	2004–2008	−8.3* (−9.8 to −6.8)	2008–2015	3.5* (2.8 to 4.2)
Seychelles	2004–2012	−5.2 (−11.4 to 1.3)	—		—	
Kenya	2004–2014	14.6* (3.2 to 27.3)	—		—	
Mozambique	2004–2016	1.0 (−3.2 to 5.3)	—		—	
Botswana	2004–2016	1.8* (0.6 to 3.0)	—		—	
South Africa	2004–2016	2.6* (2.5 to 2.7)	2004–2014	2.7* (2.6 to 2.8)	2014–2016	1.7* (0.4 to 2.1)

Abbreviations: APC, annual percent change; AAPC, average annual percent change; CI, confidence interval.
*$p < .05$.

The WHO estimates the need for an increase of almost 140% to meet the threshold (WHO, 2006). Thus, in global terms, the number of nurses should go from 1 million to 1.5 million between 2013 and 2030, but the number required to meet the needs will increase from 1.8 to 2.8 million (WHO, 2016). That is, the shortage of nurses will increase faster than their presence and this, aggravated by the absence of trend in some cases or decreasing trend in others, identified since 2013.

Furthermore, the data show that 45 of the 50 countries of sub-Saharan Africa have NPP ratios lower than the worldwide average of 28 nurses per 10,000 inhabitants (WHO, 2009). Most countries are far below the minimum accepted limit. Only the Seychelles, South Africa, Mauritius, Namibia and Botswana have a density of nurses and midwives above the average worldwide.

In addition to this negative finding, there are only seven countries with an increasing trend (Gambia, Kenya, Botswana, Nigeria, South Africa, Ethiopia and Mauritius), although in the rest, either the trend is decreasing or does not present any trend that suggests a change in this indicator in the short term. Consequently, some authors suggest that despite the need expressed to focus efforts on policies

to increase and consolidate health care workforce, there are problems that make it difficult to achieve these objectives, such as ineffective retention strategies, insufficient investment in human resources, lack of incentives, lack of education reforms and inability to translate policy into action (WHO et al., 2011).

The highest nurses per population ratios still appear in the most geographically privileged regions, like Southern Africa (Botswana, Lesoto, Namibia and South Africa). Specifically, Botswana and South Africa have some of the highest NPP ratios on the continent. In addition, both presented significant increasing trends in the NPP ratio, although moderate. South Africa has a constant upward trend, so it seems that the results of the overall human resource development strategy envisaged by the National Health Insurance since 2006 and particularly the nursing strategy implemented in 2008 have been positive (Rispel & Barron, 2012). These strategies included training and capacity building initiatives, community service for health professionals and the implementation of various financial incentives (Rispel & Barron, 2012).

Nonetheless, South Africa suffers pronounced differences in rates of morbidity and mortality and in access to the health system,
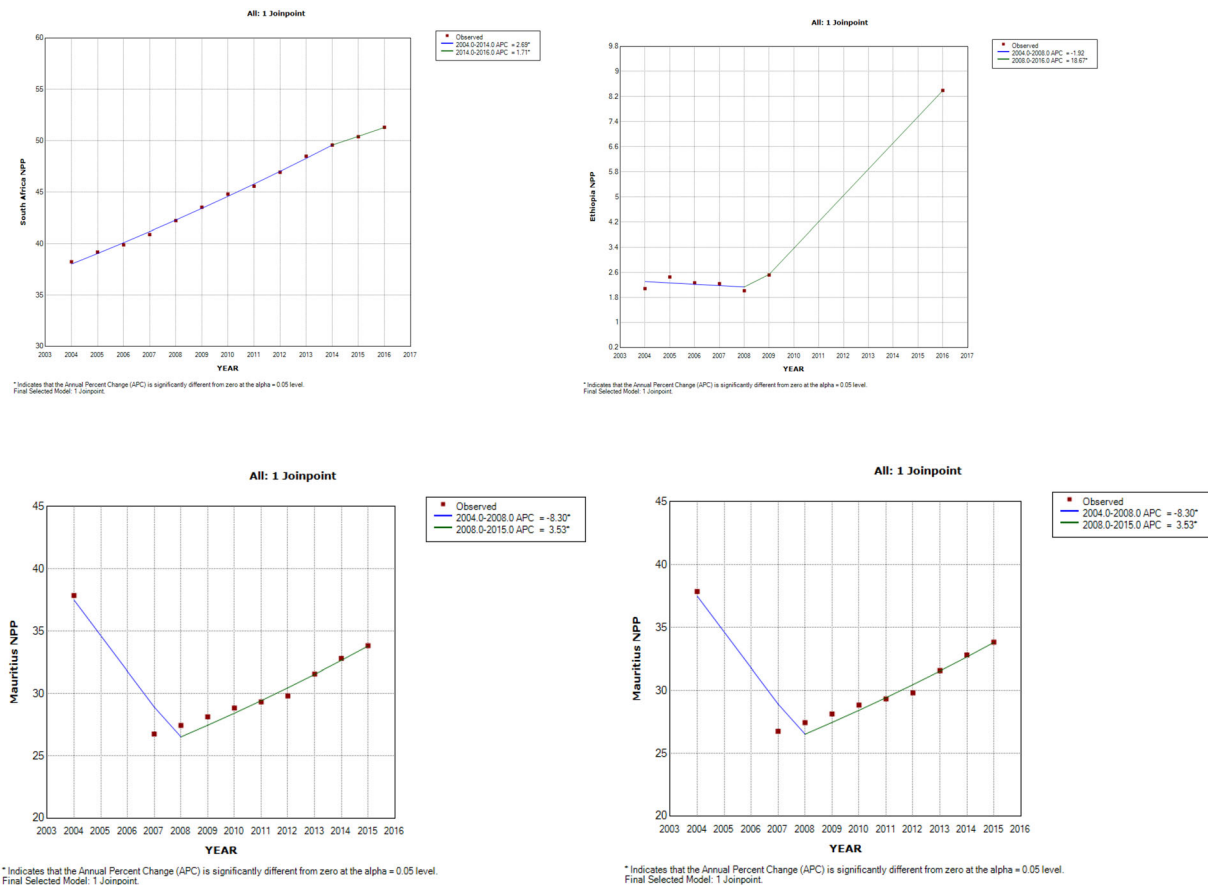
FIGURE 3 NPP rate trend in South Africa, Ethiopia, Madagascar and Mauritius (2004–2016)

between races, between provinces and between men and women (Coovadia et al., 2009). This leads to think that the analysis of the NPP ratio should go beyond the global figure, because despite having a high density, the reality of South Africa is that there is a maldistribution of staff, with an important migratory movement of nurses from the public to the private sector (Coovadia et al., 2009). The same occurs in Botswana, another of the countries with the highest NPP ratio, where the density of nurses and midwives in rural districts are significantly lower than in urban districts (26 vs. 77 per 10,000 population in 2012) (Nkomazana et al., 2014).

Factors for the withdrawal of health workers in rural areas are several, including the limited options for career progression and the lack of amenities or incentives. On the other hand, due to the low salaries perceived by health care workers in sub-Saharan Africa, in urban areas, these professionals often develop unauthorized private practice to complete their income (Anyangwe & Mtonga, 2007). In this line, evidence suggests that in some countries of sub-Saharan Africa, the areas with a higher level of staff shortages are the primary care sector, the poorest regions or those with a low-level health facilities, in a manner that the staffing is inversely related to poverty and level of need (Willcox et al., 2015).

Two of the other countries with the best NPP ratios are Mauritius and Seychelles, belonging to the East African region. In Mauritius, a small island in the Indian Ocean, recruitment to nursing is

facilitated by increased access to higher education for women in recent years and by political and social changes with an increased competition for employment in the public health sector (Hollup, 2012). In addition to this, nursing education in Mauritius is considered a paid employment; thus, nursing students receive a salary during their education and clinical practice, which has proven to be an important factor for recruitment (Hollup, 2012). Nevertheless, in the case of Mauritius, establishing a trend model is particularly difficult due to the influence of the first value in 2004 followed by a 2-year data gap. Consequently, the outlier record is influencing the overall trend of the country, providing a two-slope trend with inverse direction, although it presents a clear increasing trend since 2008.

Seychelles, for its part, an archipelago in the Indian Ocean, has experienced significant social and economic progress in recent decades. The development of a comprehensive health care infrastructure, with universal access to health, free primary care, and good sanitation, water and hygiene supply has improved the population's health (Shamlaye et al., 2020; WHO, Regional Office for Africa, 2016). Nurses are the main axis of the health system and lead most of the health programmes. And even as it is an archipelago, nurses are the only health personnel in the peripheral islands (Agricole et al., 2014), aspects that can be related to the high NPPs. However, this country did not present significant trends of the nurse–population ratio.

It is also in the East Africa region where we find three of the countries with the most disadvantaged NPP ratios: Somalia, Madagascar and Ethiopia. In the case of Somalia, with less than 1 nurse per 10,000 inhabitants, apart from being one of the poorest countries on the planet, it suffered a civil war in the 80s and in the 90s, in which hospitals and health centres were devastated and many health care professionals were killed or became refugees (Ismail, 2011). The country still strives today to rebuild health facilities and to increase the number of health care workers (Crichton, 2013). On the other hand, Madagascar not only presents very low numbers of nurses per 10,000 population, but it also shows a clear downward trend. It seems that the advances produced in the last years in nursing education and in the nursing profession, including the establishment of professional bodies, are insufficient (Plager & Razaonandrianina, 2009).

The case of Ethiopia is different, because there is a clear upward trend between 2008 and 2016, going from 2 to 8.4 NPP ratio. In recent years, the country has implemented policies to strengthen motivation and retention of the diploma-level nursing workforce, such as the implementation of nursing specialty training programmes at a bachelors' degree level (Ministry of Health [MoH], 2016). The aim today is to meet the 2025 benchmark set by the WHO for Sub-Saharan Africa: 2.3 per 1,000 population, as the minimum threshold of health professionals to population ratio (MoH, 2015, 2016).

In this region, another of the countries presented a clearly positive trend: Kenya. This positive trend, which goes from three to four nurses and midwives per 1,000 population to 15, seems to coincide with the launch of the denominated emergency hiring plan. The aim of this plan was to remediate acute nursing shortages in remote and underserved areas, through the use of public–private partnerships to fund and increase nursing worker deployment (Gross et al., 2010; Reynolds et al., 2013).

In the case of the West Africa Region, Gambia and Nigeria are the countries that showed positive trends. Gambia has gone from 7.6 nurses and midwives per 1,000 population in 2004 to 14.5 in 2016. In 2005, the government of this country launched a 'health workforce plan' that detailed a 15-year strategy to ensure adequate, appropriate, well-trained human resources at all levels of the health system in accordance with National priorities, Poverty reduction strategy and Millennium Development Goals (Omar Toure et al., 2005). With regard to Nigeria, the positive trend, which started in 2009, should be taken with caution, because it is based on the appearance, in that year, of a figure below the data reported up to that moment, which may be a consequence of some error in the logs. Nigeria has serious problems retaining its nurses in the country; some of the reasons for their emigration are the search for the improvement of their economic possibilities, better work environments and career progress opportunities (Salami et al., 2016).

One of the main problems in Africa is the tendency of health workers to emigrate in search of better conditions (Kopolo-Munjanja et al., 2005). Nurses not only seek alternatives outside of Africa but also move to other countries within the continent, seeking better working conditions. It is worthy of note that a good proportion of the

health workforce in the Americas originates from sub-Saharan Africa (Anyangwe & Mtonga, 2007).

In addition to the nursing emigration rate, other factors should be taken into consideration to approach the shortage of human resources for nursing, such as the places where nursing students are trained (Griffiths et al., 2018). Indeed, according to Anyangwe and Mtonga (2007), among the key problems contributing to the shortages are the insufficient training opportunities. As WHO noted, the recommendation for improving the health care needs is to manage and to provide nursing colleges and schools with their own human resources (Hayes-Bautista et al., 2016).

Finally, it should be noted that it is difficult to interpret the trends due to the few records available in most of the countries. Moreover, an additional factor to consider is the missing data from countries such as South Sudan, Eswatini and Rwanda that did not have published any information. Therefore, it is difficult to carry out an exhaustive and reliable analysis. Further investigation is recommended in order to overcome the incomplete datasets and the issues encountered in the study.

5 | CONCLUSIONS

The present study contributes to mapping the density of nurses and midwives in sub-Saharan Africa, promoting a global view of the reality and needs related to nursing human resources in this region. Our study indicates that the distribution of nurses and midwives varies among sub-Saharan African countries. Although a few countries present ratios higher than the average worldwide (Seychelles, South Africa, Mauritius, Namibia and Botswana), the majority of them are far below the minimum accepted limit. Moreover, only seven countries show an increasing trend, although in the case of the rest, either the trend is decreasing or they do not present any trend that suggests a change in this indicator in the short term. Certainly, the most advantaged region is South Africa, with the best rates and trends of growth.

In those countries with increasing trends, different factors might have influenced the improvement of NPP ratios, such as training and capacity building initiatives, and the implementation of various financial incentives policies to strengthen motivation and retention of the nursing workforce. From a public health perspective, these findings support the enhancement of strategies to address the current nursing workforce in these countries.

5.1 | Implications for nursing management

This study contributes to nursing management science by presenting an analysis about sub-Saharan African nurses per population ratio trends. These findings suggest that the nursing workforce in Africa is below the rest of the countries in the world. Even though until 2013 data showed an increasing trend, the reality demonstrates that this trend has not been maintained from years 2013 to 2017. Therefore,

from a macrolevel nursing management point of view, our study shows the importance of implementing actions that contribute to the increase of the nursing workforce in Africa, fundamentally considering that nursing workforce is essential to achieve the SDGs. Indeed, the attainment of the SDGs in these countries faces major impediments on account of the health workforce crisis. For this reason, the influential leadership which nurse managers can and should exercise at high levels of the health system, as well as a political leadership, seems essential.

Success cases that show positive trends in the NPP ratio may serve as inspiration for the management of other countries, when implementing measures to improve the density of nurses and midwives' figures. Although each country is unique, there are some possible solutions for addressing the overall shortage, the maldistribution and the low productivity of health workers in sub-Saharan Africa. Some of these solutions are to increase investment in pre-service training (workers with basic clinical skills), improve income and living wage, extend retirement ages, recruit from abroad and achieve a more appropriate mix of skills (Anyangwe & Mtonga, 2007). A similar effort should also be observed among African governments towards a more accountable approach to the implementation of health policy and professional regulations for nurses and midwives.

CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

ETHICAL APPROVAL

An ethical approval was not required because the data were obtained from the public databases of the World Health Organization.

DATA AVAILABILITY STATEMENT

Data derived from public domain resources

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REVIEW ARTICLE

UK nurses' and midwives' experiences of healthful leadership practices during the COVID-19 pandemic: A rapid realist review

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Abstract

Aim: We aim to explore healthful leadership practices in nursing and midwifery evident within the COVID-19 pandemic in the United Kingdom, the contextual facilitators, barriers and outcomes.

Background: Globally, the health and care sectors are under pressure and despite nurses and other professionals, demonstrating resilience and resourcefulness in the COVID-19 pandemic; this has negatively impacted on their health and wellbeing and on patient care.

Evaluation: Two searches were conducted in July 2021 and December 2021. Inclusion/exclusion criteria were identified to refine the search, including papers written since the beginning of the pandemic in 2020. A total of 38 papers were included principally from the United States and United Kingdom. Ten were research papers; the others were commentaries, opinion pieces and editorials. MS Teams literature repository was created. A unique critical appraisal tool was devised to capture

[†] Dr Jan Dewing has sadly died. She was the original PI of this work and contributed to this paper. We are forever grateful for her leadership.

contexts, *mechanisms* and *outcomes* whilst reflecting more standardized tools, that is, the Critical Appraisal Skills Programme and the Authority, Accuracy, Coverage, Objectivity and Date tool for reviewing grey literature to refine the search further.

Key issues: Six tentative theories of healthful leadership emerged from the literature around leadership strategies, which are relational, *being visible and present*; *being open and engaging*; *caring for self and others*; *embodying values*; *being prepared and preparing others*; and u*sing available information and support*. Contextual factors that enable healthful leadership practices are in the main, created by leaders' values, attributes and style. The literature suggests that leaders who embody values of compassion, empathy, courage and authenticity create conditions for positive and healthful relations between leaders and others. Nurse and midwives' voices are however absent from the literature in this review.

Conclusion: Current available literature would suggest healthful leadership practices are not prioritized by nurse leaders. Perspectives of nurses' and midwives' about the impact of such practices on their wellbeing is also missing. Tentative theories are offered as a means of identifying healthful leadership strategies, the context that enable these and potential outcomes for nurses and midwives. These will be explored in phase two of this study.

Implications for Nursing Management: Nurse leaders must be adequately prepared to create working environments that support nurses' and midwives' wellbeing, so that they may be able to provide high-quality care. Ensuring a supportive organizational culture, which embodies the values of healthfulness, may help to mitigate the impact of the COVID-19 pandemic on nurses' and midwives' wellbeing in the immediate aftermath and going forward.

KEYWORDS
nursing leadership, preparation, workforce

1 | AIM

This rapid realist review (RRR) sought to answer the following questions:

- What leadership strategies and interventions did nurses and midwives find effective in the COVID-19 crisis?
- How do contextual factors facilitate or inhibit leadership strategies and interventions?
- What are the outcomes for nurses and midwives from effective leadership strategies?

This review forms the first phase of a realist evaluation, which explored the differences in contexts that made the mechanisms (leadership strategies and interventions) work and the outcomes during the pandemic, generating tentative programme theories (Pawson et al., 2004). These theories will be tested in the second phase of the study by inviting nurses and midwives to share their experiences of leadership practices that promote healthfulness during the COVID-19 pandemic. Following theory refinement, it is anticipated that the results from the study will inform future nursing leadership and leadership preparation.

2 | BACKGROUND

Health and care sectors across the gacknlobe, although shown to be resilient and resourceful during the pandemic, are under tremendous pressure. Across all four UK nations, this has impacted on the NHS and care services ability to deliver safe and effective care (Bailey & West, 2020). Health care professionals are rapidly adapting to population health needs whilst addressing a host of urgent issues including essential resource shortages, for example, personal protective equipment (PPE). Authors (Hoernke et al., 2021; Jia et al., 2021) suggest that when resources are stretched, health care professionals are left to decide who receives treatment; resulting in the increasing provision of unanticipated end-of-life care. UK nurses and midwives have, and continue to, face changing practice considerations, including role redeployment, increased work pressures and strained interdisciplinary team working (Rossa et al., 2020). Due to prolonged physical contact

with patients, nurse's risk increased COVID-19 viral transmission, leaving them bare to the emergent suffering of patients and families, as stringent infection control and visiting policies have overhauled communication and dynamics (Rossa et al., 2020; Royal College of Nurses [RCN], 2020a). The intersection of these elements are causing accumulative high stress; producing debilitating mental, emotional and spiritual exhaustion; and increasing rates of burnout and moral distress (Rossa et al., 2020). In England and Wales, increasing rates of absenteeism in doctors, nurses and midwives have been attributed to psychiatric illness, for example, anxiety, stress and depression (just include citation to statistics). In Scotland, latest stress and absenteeism rates were published via a freedom on information request in 2017. Although in Northern Ireland, no statistics were found. In 2020, Public Health Wales (2020) surveyed 1642 nurses, midwives and health care support workers, revealing 62.1% reported work-related stress and 13.6% having difficulty in feeling relaxed. Therefore, Rossa et al. (2020) suggest that nurses and midwives require distinct leadership considerations to protect and sustain them throughout the pandemic.

Unsurprisingly, pandemic aberrance has multiplied and intensified the requirements of nurse leaders and created new complexity. Thus, Bailey and West (2020) posit nurse leaders must sustain their own motivation despite uncertainty, through ensuring their own mental wellbeing, contending this will enable coping and focus, to meet core nursing/midwifery needs. Contemporary leadership theories, for example, compassionate leadership (West et al., 2020) emerging from transformational leadership, focus on relationships, communicating a vision and involving others and autonomy. However, these negate leader wellbeing as a contextual factor. Cardiff et al. (2018) produced a new model of leadership using the person-centred framework (2017) as a theoretical lens, identifying authenticity of a leader, including showing vulnerability, as highly valuable. Their model suggests that the reciprocal leader/associate relationship enables mutual and fundamental personal growth and development. Contrastingly, NHS hierarchy amidst pandemic adopted an emergency, command and control, style of leadership and management. Despite being effective in teams where status quo exists, directive leadership is ineffectual and unsustainable in times of change, risking increased emotional fatigue, when compared with empowering leadership (RCN, 2020b; Rudolph et al., 2022; Sanchez-Manzanares et al., 2020). Unsustainable directive leadership, risks alienating the very staff who require engagement and motivation during the COVID-19 pandemic, the longevity of which, is yet to be determined (Rosser et al., 2020).

Rosser et al. (2020) suggested the following core aspects of leadership during the pandemic that need to be addressed: visibility, collaboration and advocacy for personhood. They suggested that in order to meet the needs of and support nurses, it is crucial to identify how to make leadership more visible. They contend that ensuring the nursing voice is heard and recognizing nurse wellbeing is paramount in all future decision-making (Rosser et al., 2020). The King's Fund report 'Courage of Compassion' (West et al., 2020) highlighted the ways in which nurse wellbeing must be supported. The longstanding issues of chronic excessive work pressures and inadequate working conditions have only been exacerbated by the COVID-19 pandemic. They suggested that nurse leaders and management should focus on meeting the three-core nurse needs of (I) autonomy—giving nurses control over their work lives and enabling them to act consistently with their values; (II) belonging—the need to be connected, cared for and caring of others around them at work, to feel valued, respected and supported and; (III) contribution—the need to experience effectiveness in what they do and deliver valued outcomes. In response to this report, the RCN Foundation has commissioned this realist evaluation that explored nurses' and midwives' perspectives and experiences of effective leadership strategies during the COVID-19 pandemic.

The aim of this review brings healthful leadership practices to the foreground to make recommendations for how these practices can be incorporated into future leadership strategies within nursing and midwifery beyond the pandemic. Healthful practices reflect nurses' core needs as highlighted in the King's Fund report (West et al., 2020). McCormack and McCance (2021) describe healthful practices as collaborative, featuring shared decision-making. They suggest that when leadership is transformational and innovative, staff feel supported and able to maximize their potential in line with their values. They proffer that establishing healthful practices has the potential to create healthful cultures where everyone is able to flourish. They argue that attention needs to be given to practice environments, which support person-centred practices. Person-centred processes that enable person-centred practice identified in the framework are working with the *person's beliefs* and *values*, *engaging authentically*, *sharing decision-making*, *being sympathetically present* and *working holistically* (McCormack & McCance, 2017). This paper reports on a rapid realist review (RRR) of current evidence as part of a larger realist synthesis study, exploring healthful leadership during the pandemic.

3 | EVALUATION

In this review, we aim to understand what is known in the literature about healthful leadership practices, the intended outcomes of these and different contexts that enable these practices to happen. The review question was based on the definition of a healthful culture developed by McCormack and McCance (2021, p. 29):

> A healthful culture is one in which decision-making is
> shared, staff relationships
> are collaborative, leadership is transformational, innovative practices are supported and
> is the ultimate outcome for teams working to develop
> a workplace that is person-centred.

This definition has emerged from McCormack and McCance's (2017) ideas on personhood and person centredness, central constructs to the practice of nursing. Our method, RRR, which according to Bulley et al. (2021), is an accelerated form of realist review or synthesis. As a review methodology, 'rapid review', usually used to inform policy, has different meanings in the literature. As rapid

reviews follow systematic review guidance (usually Cochrane Collaboration), decision-makers place value on the evidence reviewed and quantify any bias to inform policy (Kelly et al., 2016). However, this is not the intention of this review. Pawson and Tilley (2008) and Wong et al. (2013) propose realist synthesis as an alternative systematic method, as it can rapidly generate theories to explain why a particular intervention is likely to work, how, for whom and in what circumstances. Recognizing complexity of interventions, Lavis et al. (2005) concur citing this method as a means of informing health care management and policymaking. Using the expedited form of realist synthesis as used by Bulley et al. (2021) therefore, we contend RRR is a legitimate and innovative approach to conducting literature review. To ensure a systematic approach, we have used the RAMESES I Quality Standards for Realist Synthesis https://www.ramesesproject.org/.

The RRR approach enabled the identification of the important contextual factors (C) that facilitate or inhibit desired interventions (M) (leadership) and the (healthful) outcomes achieved (O). Contingent relationships expressed as C,M,O configurations therefore show how particular contexts or conditions trigger mechanisms to generate outcomes (Rycroft-Malone et al., 2012). According to Hewitt et al. (2012), mechanisms are the pathways from resource to reasoning and response. Thus, identified healthful outcomes will depend on contextual factors, for example, leader attributes and/or leadership styles, as well as the oractice context. The research questions were jointly agreed by the project commissioner and research team through an initial scoping of evidence and were then translated into a realist review question (Figure 1). Initial scoping of the literature is required before determining the area of focus (Kent & Ajjawi, 2022).

The systematic, iterative approach as directed by Wong et al. (2013) involved collaboration with a panel of experts contributing to each of the three phases undertaken (Figure 2). Preliminary screening of the literature was conducted by two reviewers, C. Di. and C. Da., to identify what literature existed surrounding this topic and to assist in the development of the search strategy. Screening produced limited research, and thus, scope was expanded to include specific international and grey literature to increase results (Figure 2). The terms *well-being* and *resilience* were also included as keywords as in initial searches, it was noted that this terminology was used frequently in articles of relevance to this review. The search strategy was refined, keywords and inclusion/exclusion criteria identified (Figure 3).

3.1 | Appraisal

As suggested by the RAMESES I guideline (2013), realist reviews do not lend themselves to a technical protocol but require unique consideration during appraisal, and inclusion/exclusion cannot be based solely on an assessment of document quality but more depends on relevance and robustness of the evidence to answer the research question. Thus, a unique critical appraisal tool was devised to capture *contexts*, *mechanisms* and *outcomes* whilst reflecting more standardized tools, that is, the Critical Appraisal Skills Programme (CASP) structures and the Authority, Accuracy, Coverage, Objectivity and Date (AACOD) tool for reviewing grey literature. Wong et al. (2013) recognize that this is challenging but necessary.

The search, conducted in July 2021 by C. Da., generated 52 papers, which on first reading met the inclusion criteria. Abstracts were scrutinized by C. Di. and C. Da. independently. Following discussion and debate, 19 papers were excluded as they did not meet the inclusion criteria. Initially, a total of 36 papers meeting the inclusion criteria were downloaded and collated into a shared Excel table via MS Teams. Decisions about inclusion/exclusion were documented with clear rationale in shared MS Teams literature repository. Areas of contention or concern occurred for several reasons, for example,

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Programme theory questions:
1. What leadership strategies and interventions do nurses and midwives find effective in the COVID-19 crisis?
1. How do contextual factors facilitate or inhibit leadership strategies and interventions?
1. What are the outcomes for nurses and midwives from effective leadership strategies?

Realist review question:

'What works in leadership that promotes healthful outcomes in nurses and midwives in the current pandemic, in what circumstances and why?'

FIGURE 1 Research questions
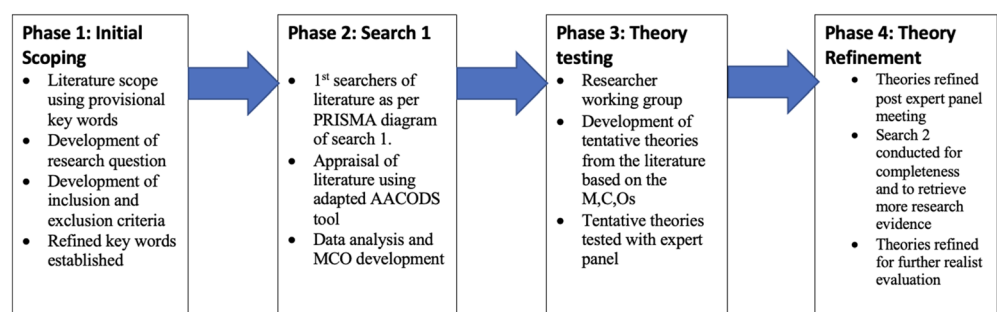
FIGURE 2 Three stage search strategy of the rapid realist review

Phase 1: Initial Scoping
- Literature scope using provisional key words
- Development of research question
- Development of inclusion and exclusion criteria
- Refined key words established

Phase 2: Search 1
- 1st searchers of literature as per PRISMA diagram of search 1.
- Appraisal of literature using adapted AACODS tool
- Data analysis and MCO development

Phase 3: Theory testing
- Researcher working group
- Development of tentative theories from the literature based on the M,C,Os
- Tentative theories tested with expert panel

Phase 4: Theory Refinement
- Theories refined post expert panel meeting
- Search 2 conducted for completeness and to retrieve more research evidence
- Theories refined for further realist evaluation

Inclusion/exclusion criteria	Key words
Inclusion criteria	Leader* OR "leadership interventions" OR "leadership strategy*"
Full text available	
English language	
Published 2020-2021	
Has focus on nursing/midwifery leadership	AND nurs* OR midwife* OR "student nurs*" OR "student midwife*" OR "healthcare support worker*"
Health and/or social care context identified	
Set within the context of the Covid-19 pandemic	
UK, Europe, USA, Canda, Australia and New Zealand	
Research and commentaries from nurse leaders	AND Covid-19 OR pandemic
Exclusion criteria	
Subjects focus on other healthcare professionals	
Commentaries with no evidence-base	AND person-centred* OR personhood OR healthful* OR well-being OR resilience OR wellness

FIGURE 3 Inclusion/exclusion criteria

papers not offering insight into leadership, lacking an evidence-base and not addressing the review question. Leadership strategies and interventions proposed were opinions from experts, often without basis in current clinical practice, lacking supporting evidence or explicit intended outcomes produced by interventions. As a result of these discussions, a further three papers were excluded, leaving a total of 33 papers included in the initial review.

Papers in this initial search (Figure 4) were mainly from the United States ($n = 16$), the United Kingdom ($n = 11$), the European Union (EU) ($n = 2$), Australia ($n = 3$) and one a review of the literature. The majority of papers were written either for or from the perspective of nurses in recognized leadership positions. This is with the exception of Boykin et al. (2021) who emphasized the informal leadership demonstrated by 'frontline' nurses using storytelling. There was also an emphasis on situational management or the management of COVID-19 disease and little evidence of nurses' voices and even less of midwives or other care workers. The missing narrative surrounding what works for nurses and midwives and what has made a difference to them, and their wellbeing amplifies the need for this programme of research. This is further augmented by only three of the papers reporting research, one mixed methods study, two qualitative and one survey. The other papers were commentaries, opinion pieces and editorials.

For completeness, a second-level search in December 2021 was again conducted to identify leadership strategies and styles (mechanisms) that impacted positively on nurses/midwives' wellbeing and the context within which the leadership was displayed (Figure 5). This search included papers from June 2021 to December 2021, focusing on research only to address the gap in the first search, that is, to better understand the experiences and hear the voice of 'frontline' nurses. This updated search yielded a total of 45 articles which following independent scrutiny by C. Di. and C. Da. revealed five articles

meeting the inclusion criteria. Research was conducted in the EU ($n = 2$), United Kingdom ($n = 1$), New Zealand ($n = 1$) and United States ($n = 1$). Thus, the total number of papers included in the review was 38. The literature table can be found in Table S1.

4 | DATA EXTRACTION

Each manuscript was coded for CMO configuration and for its potential to inform programme theory as per RAMESES I protocol. Six key factors of healthful leadership emerged: *being visible and present*; *being open and engaging*; *caring for self and others*; *embodying values*; *being prepared and preparing others*; and *using available information and support*. Scrutiny of the chains of inference has led to the generation of tentative theories within each of these domains by identifying the chains of inferences (Table 1) and has given some insights into the review questions posed. Further data synthesis in the following section identifies from the literature, what leadership strategies work, in what circumstances and why.

4.1 | Being visible and present

Throughout the literature, there was an increased emphasis on the importance of having visible, available and present nurse leaders, who listen and identify the challenges of the pandemic and needs of individuals or teams (Allen, 2020; Brodrick et al., 2020; Markey et al., 2021; Quinn et al., 2021). Allen (2020) in his paper offering advice from senior nurses on preparing and assisting depleted staff to cope during the pandemic suggested the benefit of having an open-door policy and being visible was to hear any concerns or problems. This was supported by Quinn et al. (2021) and Brodrick et al. (2020).
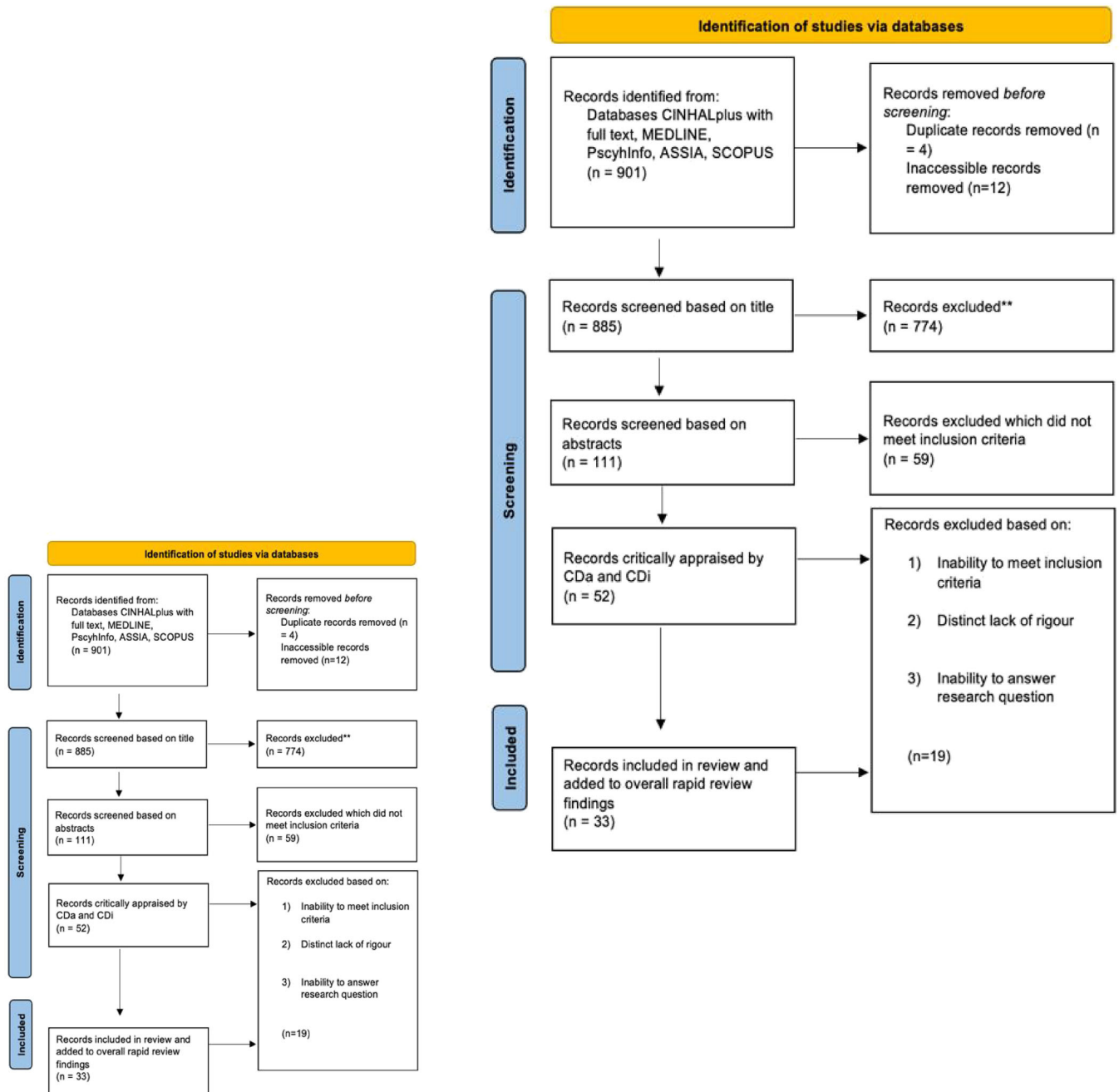
FIGURE 4 PRIMSA initial search

In the UK study by Quinn et al. (2021), focus groups were used to interview the five UK final year student nurses. They described ineffectual leaders who were absent from the clinical environment during the pandemic and effective nurse leaders as those who were available and who were able to provide support and advice. Brodrick et al. (2020) surveyed 106 nurses in New York. They found visibility enabled nurse leaders to be supportive and able to communicate consistently and meaningfully. In their small study, they found that this ensured nurses felt supported and could work in collaborative partnerships. Fortgang (2021) and Rossa et al. (2020), scholars from the United States, reviewed a range of evidence, which emphasized the importance of visibility of nurse leaders throughout organizations. They found that being visible enabled connection with staff not only enabling them to hear nurses' voices and needs as suggested by other authors (Allen, 2020; Brodrick et al. 2020; Quinn et al., 2021) but also enabling them to relay these vertically up the organizational structure to be heard by senior management. Rossa et al. (2020) suggested that this allowed staff to be acknowledged, validated feelings and built trust and engagement with the organization.

Both Quinn et al. (2021) and Rossa et al. (2020) described the outcome of having open communication as the creation of supportive environments where nurses felt heard and valued and that fostered
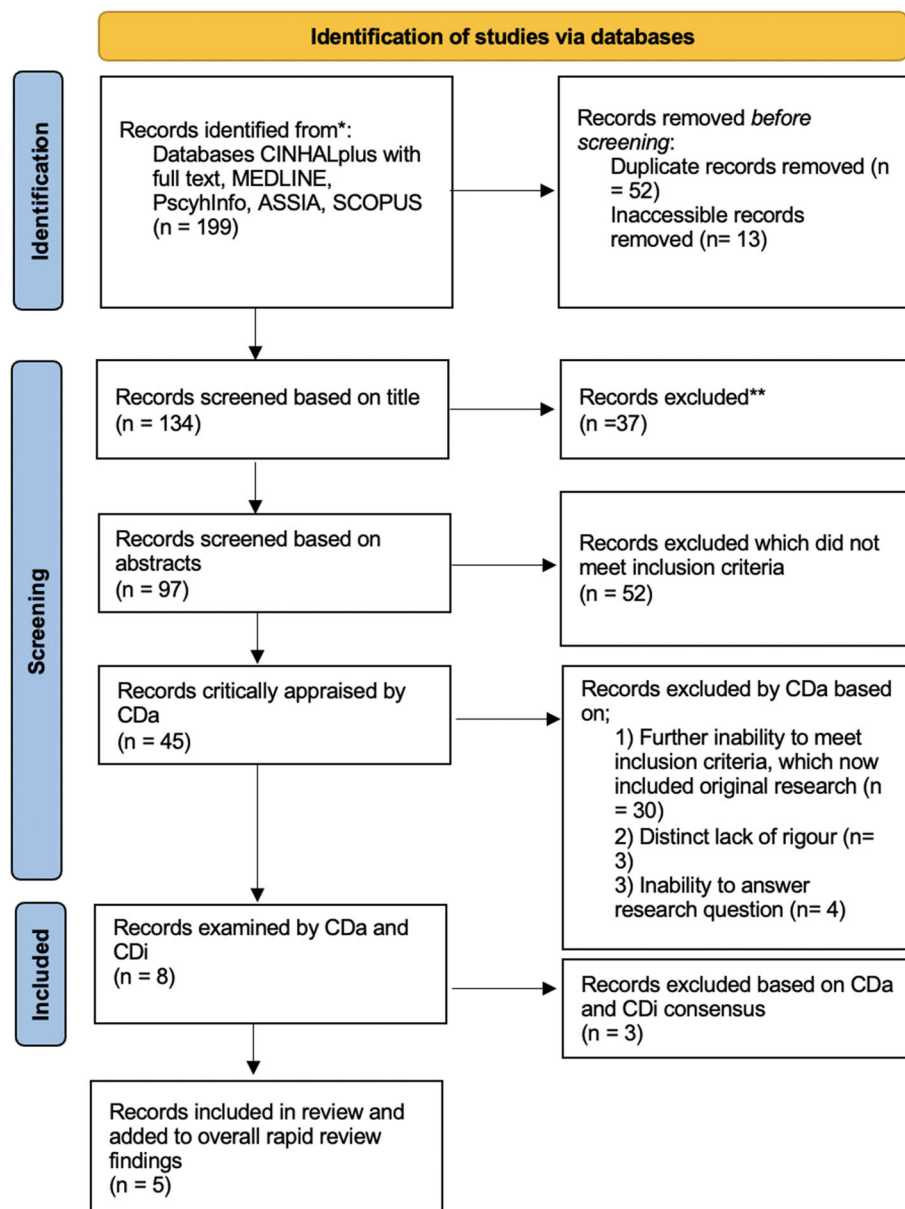
FIGURE 5 PRISMA 2 second-level search

wellbeing. This involved strategic advocacy, available mental health services, availability of fora to discuss ethical decisions and dilemmas. The review of evidence by Rossa et al. (2020) described such environments as one's where staff are not readily redeployed, and there are regular updates and an established feedback loop. However, Raderstorf et al. (2020) in their guidance based on experience of leading through previous crises argued that although maximizing their presence is crucial for nurse leaders, this is often made impossible by the increase in formal leadership responsibilities in a crisis. They argued that this does not have to mean a lack of connection with colleagues, but availability and connectivity can be maintained through the intelligent utilization of multiple horizontal communication methods. Similarly, others (Abbu, 2021; Ernst, 2020; Yoder-Wise et al., 2021) have reported on leaders, innovating in the pandemic by using social media platforms, zoom meetings, team huddles and Schwartz Rounds to best hear staff voices, provide support and encourage self-compassion as

well as compassion towards staff, colleagues and patients (Allen, 2020; Dimino et al., 2020; Hofmeyer & Taylor, 2021; Ernst, 2020).

4.2 | Being open and engaging

Leaders using openness, honesty, positivity and facilitative approaches as a means of promoting collaboration and transforming practices were themes found by Holge-Hazelton et al. (2021) in their qualitative descriptive study. Data were collected from 13 ward managers in one Danish hospital using surveys and follow-up interviews. Using person centredness as a theoretical framework, they found that the pandemic made best practice difficult for nurse leaders as they had to adapt their leadership. Some thrived and innovated to new ways of working, whereas others struggled with a crisis of leader

TABLE 1 Theories and chains of inference

Working theories what is each about?	Themes	Chains of inference (evidenced)
Theory 1: Being visible and present Nurse leaders who are visible and available (C) to nurses use multiple communication methods (M) to understand and respond to individual and team need that promotes their wellbeing (O) and creates a safe supportive work environments (where people feel heard, valued, etc.) (O) This means they are also able to be advocate at a strategic level (M).	Visibility Multiple communication methods (horizontal and vertical) Safe, supportive work environment	C: Visibility/availably as part of a safe supportive work environment (Allen, 2020; Brodrick et al., 2020; Digby et al., 2021; Fortgang, 2021; Markey et al., 2021; Moore, 2020; Quinn et al., 2021; Raderstorf et al., 2020; Rossa et al., 2020; Rosser et al., 2020; Vogel & Flint, 2021) M: Multiple communication methods (listening, being present, team huddles, protocols, emails, zoom, Schwartz Rounds, collaborative dialogue, horizontal and vertical communication (Abbu, 2021; Allen, 2020; Brodrick et al., 2020; Catania et al., 2021; Croke, 2020; Digby et al., 2021; Dimino et al., 2020; Ernst, 2020; Fortgang, 2021; Hoffmann et al., 2020; Hoffmeyer & Taylor, 2021; Holge-Hazelton et al., 2021; Howell, 2021; Markey et al., 2021; Merchant, 2021; Moore, 2020; Rossa et al., 2020; Vogel & Flint, 2021; Yoder-Wise et al., 2021) Advocacy (Brodrick et al., 2020; Hoffman et al., 2020; Rossa et al., 2020) O: Feeling heard (Howell, 2021; Markey et al., 2021); compassionate culture (Croke, 2020; Hoffmeyer & Taylor, 2021; James et al., 2020; Vogel & Flint, 2021); authentic relationships (Dimino et al., 2020; Fortgang, 2021; Holge-Hazelton et al., 2021); environment of trust (Abbu, 2021; Brodrick et al., 2020; Cathcart, 2020); caring culture (Dimino et al., 2020) feeling valued (Harrington, 2021; Hoffmeyer & Taylor, 2021; Holge-Hazelton et al., 2021; Kellish, 2020)
Theory 2: Being open and engaging Emotionally intelligent leaders are person-centred facilitators who are reflexive and open to learning from others (C). They foster engagement, motivate and empower nurses (M) to engage in collaborative working practices and transform practice (O)	Person-centred facilitators Facilitation interventions Collaboration/ collaborative working practices Transformation of practice	C: Emotional intelligence (James et al., 2020); reflexivity (Duncan, 2020; Kellish, 2020); learning from others (Foster, 2020; Quinn et al., 2021) M: Facilitation (Boykin et al., 2021; Brodrick et al., 2020; Catania et al., 2021; Croke, 2020; Dimino et al., 2020; Duncan, 2020; Foster, 2020; Fortgang, 2021; Harrington, 2021; Hoffmeyer & Taylor, 2021; Kellish, 2020; Markey et al., 2021; Merchant, 2021; Moore, 2020; Quinn et al., 2021; Raderstorf et al., 2020; Rossa et al., 2020; Rosser et al., 2020; Vogel & Flint, 2021) Engagement (Croke, 2020; Foster, 2020; Fortgang, 2021; Hoffman et al., 2020; Hoffmeyer & Taylor, 2021; Holge-Hazelton, 2021; Vogel & Flint, 2021); giving feedback (Moore, 2020; Rossa et al., 2020); codesign (Raderstorf et al., 2020); mentorship (Markey et al., 2021; Vogel & Flint, 2021); transformative practices (Catania et al., 2021; Harrington, 2021; Rosser et al., 2020) O: Collaborative working practices (Abbu, 2021; Brodrick, 2020; Ernst, 2020, Hoffman et al., 2020) transformative practice (Catania et al., 2021; Harrington, 2021; Rosser et al., 2020)
Theory 3: Caring for self to care for others Self-nurturing practices of leaders create conditions for expression of authenticity and equanimity (C) enabling nurse leaders to be resilient, other centred and caring (O). This acts as a catalyst for nurses and teams to engage in wellbeing practice, thus promoting their own resilience, increasing morale and job satisfaction (O).	Self-nurturing Leadership attributes Self-care Resilience-building Job satisfaction	C: Self-nurturing (Croke, 2020; Dimino et al., 2020; Duncan, 2020; Harrington, 2021; Hoffmeyer & Taylor, 2021; Howell, 2021; James et al., 2020; Merchant, 2021; Quinn et al., 2021; Raderstorf et al., 2020; Vogel & Flint, 2021; Yoder-Wise et al., 2021); equanimity (Abbu, 2021; Cathcart, 2020; Howell, 2021; Moore, 2020); authenticity (Brodrick et al., 2020; Catania et al., 2021; Cathcart, 2020; Dimino et al., 2020; Ersnt, 2020; Holge-Hazelton et al., 2021; Howell, 2021; Kellish, 2020; Quinn et al., 2021) self-care of leader (Dimino et al., 2020; Hoffmeyer & Taylor, 2021; Holge-Hazelton et al., 2021; Markey et al., 2021; Merchant, 2021)

(Continues)

TABLE 1 (Continued)

Working theories what is each about?	Themes	Chains of inference (evidenced)
		M: Other centred and caring (Boykin et al., 2021; Cathcart, 2020; Croke, 2020; Digby et al., 2021; Dimino et al., 2020; Foster, 2020; Hofmeyer & Taylor, 2021; Howell, 2021; Kellish, 2020; Moore, 2020; Raderstorf et al., 2020; Rossa et al., 2020; Rosser et al., 2020); listening (Allen, 2020; Digby et al., 2021; Dimino et al., 2020; Howell, 2021; Markey et al., 2021, Moore, Rossa et al., 2020; Vogel & Flint, 2021; Yonder-Wise et al., 2021); being present (Abbu, 2021; Brodrick et al., 2020; Croke, 2020; Dimino et al., 2020; Holge-Hazelton et al., 2021; Merchant, 2021; Moore, 2020)
		O: Self-care of staff (Abbu, 2021; Dimino et al., 2020; Harrington, 2021; Hofmeyer & Taylor, 2021; Holge-Hazelton, 2021; Markey et al., 2021); resilience (Croke, 2020; Digby et al., 2021; Dimino et al., 2020; Duncan, 2020; Fortgang, 2021; Hoffman et al., 2020; Hofmeyer & Taylor, 2021; Markey et al., 2021; Vogel & Flint, 2021); increased morale (Harrington, 2021; Hofmeyer & Taylor, 2021; Howell, 2021; Kellish, 2020; Markey et al., 2021); job satisfaction (Boykin et al., 2021; Catania et al., 2021; Harrington, 2021; Haque, 2021)
Theory 6: Informed nurse leaders who are a conduit of information (C), utilize organizational support systems and services and practical support (M) to reduce nurse (staff) risk of psychological harm (O)	Being a conduit of information Utilizing organizational support systems and services Reduce risk of psychological harm	C: Clear, concise information-giving (Brodrick et al., 2020; Digby et al., 2021; Fortgang, 2021; Rossa et al., 2020); protocols (Catania et al., 2021; Hofmeyer & Taylor, 2021)
		M: Availability of support (Abbu, 2021; Duncan, 2020; Rossa et al., 2020); support spaces (Croke, 2020; Hofmeyer & Taylor, 2021; Vogel & Flint, 2021); spaces for discussion (Brodrick et al., 2020; Cathcart, 2020; Fortgang, 2021; Raderstorf et al., 2020); psychological support Catania et al., 2021; (Croke, 2020; Duncan, 2020; Merchant, 2021); mental health support (Duncan, 2020)
		O: Reduced risk of psychological harm (Allen, 2020; Digby et al., 2021; Yonder-Wise et al., 2021); PTSD (Duncan, 2020); moral distress (Hofmeyer & Taylor, 2021); emotional burnout (Allen, 2020; Croke, 2020; Duncan, 2020; Markey et al. 2021; Rossa et al., 2020); distress (Croke, 2020; Harrington, 2021; Merchant, 2021; Markey et al., 2021); disengagement (Brodrick et al., 2020; Croke, 2020; Hofmeyer & Taylor, 2021)
Theory 4: Embodying values An authentic leader that embodies values of compassion, honesty, openness, humility, empathy, respect, vulnerability and courage (C) works with peoples' beliefs and values whilst aligning organizational values (M). They strive to create a healthful culture where people can be sympathetically present in spaces for discussion, learning and innovation, (O).	Leadership values Shared values and beliefs Healthful cultures Communicative action	C: Leaders empathy (Brodrick et al., 2020; Ernst, 2020; Foster, 2020; Harrington, 2021; Hofmeyer & Taylor, 2021; James et al., 2020; Kellish, 2020; Quinn et al., 2021; Raderstorf et al., 2020; Rossa et al., 2020; Vogel & Flint, 2021; Yonder-Wise et al., 2021); compassion (Cathcart, 2020; Harrington, 2021; Hofmeyer & Taylor, 2021; Howell, 2021; James et al., 2020; Vogel & Flint, 2021); honesty (Boykin et al., 2021; Duncan, 2020; Eldridge et al., 2020; Fortgang, 2021; Hofmeyer & Taylor, 2021; Holge-Hazelton et al., 2021; Howell, Merchant, 2021; Moore, 2020); openness and transparency (Abbu, 2021; Brodrick et al., 2020; Eldridge et al., 2020; Ernst, 2020; Holge-Hazelton et al., 2021; Merchant, 2021; Moore, 2020; Quinn et al., 2021; Rossa et al., 2020; Rosser et al., 2020); authenticity (Brodrick et al., 2020; Catania et al., 2021; Cathcart, 2020; Dimino et al., 2020; Ersnt, 2020; Holge-Hazelton et al., 2021; Howell, 2021; Kellish, 2020; Quinn et al., 2021); courage (Boykin et al., 2021, Fortgang, 2021); humility

(Continues)

TABLE 1 (Continued)

Working theories what is each about?	Themes	Chains of inference (evidenced)
		(Abbu, 2021; Boykin et al., 2021; Fortgang, 2021; resilience (Fortgang, 2021; Vogel & Flint, 2021); grace (Yoder-Wise et al., 2021); vulnerability (Ernst, 2020); love (Kellish, 2020); respect (Catania et al., 2021; Kellish, 2020) M: Working with people's beliefs and values (Eldridge et al., 2020; Hofmeyer & Taylor, 2021; James et al., 2020; Markey et al., 2021) clarity of beliefs, values and vision (Abbu, 2021; Boykin et al., 2021; Croke, 2020; Fortgang, 2021; Moore, 2020); alignment of organizational values (Eldridge et al., 2020; Hofmeyer & Taylor, 2021; Yonder-Wise et al., 2021) O: Reduced uncertainty (Digby et al., 2021); increased morale (Harrington, 2021; Hofmeyer & Taylor, 2021; Howell, 2021; Kellish, 2020; Markey et al., 2021); feeling supported (Croke, 2020; Harrington, 2021); increased resilience (Croke, 2020; Digby et al., 2021; Dimino et al., 2020; Duncan, 2020; Fortgang, 2021; Hoffman et al., 2020; Hofmeyer & Taylor, 2021; Markey et al., 2021; Vogel & Flint, 2021); feeling empowered (Dimino et al., 2020) trust (Brodrick et al., 2020; Fortgang, 2021; Kellish, 2020; Moore, 2020); promotes healing (Cathcart, 2020); improved health of leaders (James et al., 2020); job satisfaction (Boykin et al., 2021; Catania et al., 2021; Haque, 2021; Harrington, 2021); improved QOL (James et al., 2020); connectedness (Duncan, 2020); learning spaces (Fortgang, 2021; Hofmeyer & Taylor, 2021; Howell, 2021; Rossa et al., 2020; West et al., 2020)
Theory 5: Being prepared and preparing others A prepared leader is able to foster trust through developed leadership expertise and understanding of themselves as a leader and their preferred approach (C). They ensure teams have adequate preparation and practical support, creating learning spaces (M), which promotes innovation and indicative of a learning environment (O).	Preparedness of leader Preparedness of staff Learning environment	C: Knowing self as a leader (Abbu, 2021; Allen, 2020; Cathcart, 2020; Duncan, 2020; Howell, 2021; James et al., 2020; Moore, 2020; Quinn et al., 2021; Yonder-Wise et al., 2021); leadership expertise (Boykin et al., 2021; Duncan, 2020; Eldridge et al., 2020; Hoffman et al., 2020; Holge-Hazelton et al., 2021; Rosser et al., 2020); leadership preparation (Howell, 2021); leadership styles (Catania et al., 2021; Dimino et al., 2020; Duncan, 2020; Ernst, 2020; Fortgang, 2021; Harrington, 2021; Hofmeyer & Taylor, 2021; James et al., 2020; Rosser et al., 2020; Vogel & Flint, 2021) M: Availability of training (Abbu, 2021; Catania et al., 2021; Hofmeyer & Taylor, 2021; Merchant, 2021); learning spaces (Fortgang, 2021; Hofmeyer & Taylor, 2021; Howell, 2021; Rossa et al., 2020; West et al., 2020); giving feedback (Moore, 2020; Rossa et al., 2020) O: Innovation (Foster, 2020; Howell, 2021)

identity. They concluded that nurse leaders required support themselves to be able to provide good leadership and hence quality care. Markey et al. (2021) advocated similarly in their guidance drawn from literature and using Lawton and Paez Gabriunas' (2015) integrated ethical leadership framework. Viewing evidence from previous pandemics through a lens of resilience and learning lessons from previous pandemics, Duncan (2020) advocated mentoring relationships, which she suggested develops individual's resilience and builds positive, and nurturing professional relationships. The intention of mentoring was identified as practising healthy coping strategies to support their self-efficacy; promote camaraderie and resilience; and develop emotional awareness, autonomy and empowerment. The techniques mentors used included positivity, writing reflective journals and debriefing. Holge-Hazelton et al. (2021), Crooke (2020), Dimino et al. (2020) and Hofmeyer and Taylor (2021), offering leadership advice during the pandemic to promote wellbeing in their commentaries, suggested that through positivity, nurses experienced an enhanced sense of well-being, improved team working and increased commitment to organizational goals. This would be achieved by leaders who have leadership knowledge, are role models and resilient, through strategies such as having clarity of values and beliefs, utilizing feedback from staff to innovate and solve problems together, hope huddles and celebrating successes. They posit that this would lead to higher quality patient care and the involvement of staff in decision-making and codesign.

Dimino et al. (2020) reported that nurse leaders who can provide supportive engagement cultivate a caring culture where high-quality patient care is the norm. In their paper offering advice for leaders, they suggested that leaders can promote psychological capital, by being 'emotionally available'. Interventions such as 'hope huddles', providing teams with inspiring quotes, celebrating success and reframing negative experiences as creating social persuasion (the conditions for success), optimism, encouragement and a supportive environment they claim are means to achieving this. Positive emotional environments were also highlighted by Harrington (2021) in her paper, examining leadership styles that she considered to be the most effective during the pandemic. She suggested that such environments are compassionate and values based, where the team know each other. In such environments, the connection between patient and nurse experiences is kept visible, and the leadership is values based. She proffered it as a means of transmuting negative emotions into positive ones by providing an empathic response to distressed teams or individuals. In their commentary, examining values-driven leadership in challenging times, James et al. (2020) suggested that leaders can inspire others by channelling passion, motivation and their emotions towards the achievement of set goals. Duncan (2020) suggested that leaders can develop emotional intelligence through sharing and reflecting on experiences of vulnerability, which can enable the development of personal resilience although resilience did not feature prominently in the literature. James et al. (2020) described emotional intelligence as exhibiting self-control and self-awareness. An aspect of emotional intelligence identified by Quinn et al. (2021) in their study, exploring final year students' experiences of working during the COVID 19 pandemic, is being open to learning from others and in doing so, being perceived as more approachable and better equipped to connect with and inspire teams.

4.3 | Caring for self to care for others

Authenticity is a recurring theme in the commentaries written by nurse leaders from the United Kingdom and the United States. Authenticity is viewed as vital to enable leaders to convey the realities of the stressful nature of the pandemic. Yonder-Wise et al. (2021) suggested that leaders who practise with agility and grace would be calmer and more authentic during crises, whereas Ernst (2020) and Quinn et al. (2021) reported that leaders able to express their own vulnerability can build authentic relationships and connectedness with their staff. In their commentary, Cathcart (2020) and Moore (2020), both academics from the United States, offered advice to leaders, suggesting calm or equanimous leaders, who control their emotions during uncertainty, would be able to reduce fear, instil confidence in others and create feelings of safety. Although authenticity and equanimity must exist alongside 'other-centred' intentions to care, compassion can be reciprocal (Dimino et al., 2020; Howell, 2021; Moore, 2020). In their paper advocating means of supporting staff during the pandemic, Vogel and Flint (2021) highlighted the self-care feedback loop that exists, whereby nurse leaders who care for themselves demonstrate the importance of self-care in the nurses. They claimed this would lead to better recognition and value of self-care generally within the clinical environment.

Both Duncan (2020) and Foster (2020) advocated for an environment of self-care, but they suggested it is reliant on nurse leaders, displaying respect of personhood in their caring intentions However, in their commentaries, Hofmeyer and Taylor (2021) and Croke (2020) emphasized that resilience and self-care are the dual responsibility of the individual nurse and the wider organization. The need for nurse leaders to prioritize 'self-'and self-nurturing is highlighted as a particular need during the pandemic (James et al., 2020; Yonder-Wise et al., 2021). A self-nurturing leader is resilient and a role model according to several opinion leaders (Croke, 2020; Dimino et al., 2020; Duncan, 2020; Merchant, 2021; Raderstorf et al., 2020; Yonder-Wise et al., 2021). They suggested this would promote resilience in staff and foster wellbeing, whereas Hofmeyer and Taylor (2021) and Raderstorf et al. (2020) specified outcomes of increased morale, engagement and job satisfaction for nurses. Hofmeyer and Taylor (2021) offered strategies and resources for nurse leaders to use and lead with empathy and prudence through the COVID-19 pandemic. They suggested empathic conversations, specific clinical learning and resources, providing mental health resources, personalized self-care plans, compassionate action and Schwartz Rounds.

4.4 | Embodying values

Leaders who embody their values were another contextual factor featured in the literature. Yonder-Wise et al. (2021), Hofmeyer and

Taylor (2021) and Moore (2020) emphasized that leaders must know themselves to be able to explicitly share their beliefs and values with staff and that they must also be aligned to organizational values. Moore (2020) highlighted the importance of vision and values in her review of evidence to offer suggestions of leading during a crisis. She advocated embodying values to give insight to others' suffering. This would enable them to offer decompression strategies such as adequate breaks, flexible working, chats to keep in touch, as well as triaging and allocating resources effectively. Hofmeyer and Taylor (2021) also offering advice to avoid burnout specifically suggested offering organizational interventions would promote engagement. These interventions are supported by others (Harrington, 2021; James et al., 2020; Vogel & Flint 2021). They framed this as compassionate action and suggested that it would not be possible without first hearing and being 'alive to the suffering of others', linking the two concepts.

Other commentators highlighting values as contextual factors enabling effective leadership were courage, openness and honesty (Boykin et al., 2021) and advocacy, which emerged in Rossa's (2020) review of evidence of leadership during crises. Three commentators (Holge-Hazelton et al., 2021; Merchant, 2021; Moore, 2020) suggested that authentic nurse leaders would be able to share what they know and what they did not know about the pandemic. Openness and honesty would allow nurse leaders to demonstrate their vulnerability, making it possible for others to share their own vulnerability (Eldridge et al., 2020; Ernst, 2020; Holge-Hazelton et al., 2021; Kellish, 2020) and boosting their credibility as leader. Duncan (2020) found communication principles have the potential to relieve others' stress in her review of evidence. Eldridge et al. (2020) also promoted communication, that is, concise, consistent, timely and open messaging, regular updates, which are research and evidenced based; credibility, honesty and openness. They also highlighted leaders who are respectful are valuable to nurses as they promote calm and co-operation in times of increased stress and vulnerability. Holge-Hazelton et al. (2021), Kellish (2020), Vogel and Flint (2021) suggested respectfulness. They described healthful cultures being built around recognizing the significance of human-to-human connection where all individuals are valued equally. In a culture such as this, nurses would be able to contribute to discussions, learning, innovation and shared decision-making (Allen, 2020; Holge-Hazelton et al., 2021; Raderstorf et al., 2020). Hence, a healthful flourishing culture is one dependent on an authentic leader who communicates well and embodies their beliefs and values including openness, honesty, compassion and empathy.

4.5 | Being prepared and preparing others

Certain leadership styles, for example, authentic, compassionate and transformational leadership, are widely referenced throughout the literature as means of maintaining morale and ensuring staff feel supported (Catania et al., 2021; Harrington, 2021; James et al., 2020). During the pandemic, the supportive nature of these styles places an emphasis on the wellbeing of nurses according to Rosser et al. (2020)

and James et al. (2020). Preparedness of leaders was evident only in two papers (Cook et al., 2021; Duncan, 2020) although others identified experience and knowledge of 'self' as important in being a prepared leader. The role of propositional knowledge, developed through role experience, was echoed by several authors (Ernst, 2020; Harrington, 2021; Quinn et al., 2021). So too was recognizing the value of inherent leadership characteristics and attributes in nurses. Once again, the precursor is understanding themselves as leaders, as well as propositional knowledge. Learning lessons from a qualitative study exploring experiences of Italian frontline nurses ($n = 23$) during the pandemic, Catania et al. (2021) particularly highlighted the need for appropriate training opportunities for nurses particularly where they found themselves in unfamiliar clinical environments after redeployment. Drawing on a review of research conducted in previous pandemics, Moore (2020) also advocated conducting formal mandatory training, during circumstances of high stress, although acknowledged caution as this might increase nurse workload and therefore stress.

The importance that prepared leaders in turn would ensure preparedness of nurses who can in turn practise flexibly and foster trust was reported by Holge-Hazelton et al. (2021), Hofmeyer and Taylor (2021) and Fortgang (2021). Fortgang (2021) advocated joint provision of appropriate training and leader preparedness as well as the formation of learning spaces may empower nurses to become involved in decision-making. The importance of learning spaces, despite no clear definition, was a recurring theme in the literature. They are repeatedly referred to as informal spaces where nurses can discuss and reflect on clinical challenges, increasing the pool of nursing knowledge and collaboration and creating opportunities for creativity and innovation (Fortgang, 2021; Howell, 2021; West et al., 2020). However, in Hofmeyer and Taylor's (2021) commentary, they expressed concern that these spaces may have been eroded by the worsening conditions of the pandemic and mandated physical distancing, affecting the cultivation of a 'community at work'. Leaders who are themselves prepared are able to maintain an environment of learning appears to be integral to the development of a healthful culture.

4.6 | Using available information and support

It is widely reported in the literature, whether through research or commentary that nurse experiences of caring during the COVID-19 pandemic, pose a serious risk to nurses' psychological wellbeing and there is a need for information and support because they are forced to provide suboptimal care with limited knowledge and resources and the prevalence of end-of-life care for patients with poor outcomes (Abbu, 2021; Allen, 2020; Catania et al., 2021; Croke, 2020; Hofmeyer & Taylor, 2021; Merchant, 2021). Moreover, the practical implications of the COVID-19 pandemic and the associated stresses may be compounded by financial instability through furlough, particularly in the United States or issues with childcare (Abbu, 2021; Digby et al., 2021; Hofmeyer & Taylor, 2021). Risks to psychological wellbeing raised in the literature included an increased risk of burnout,

moral injury, distress and other mental health disorders (Croke, 2020; Duncan, 2020; Merchant, 2021; Rossa et al., 2020). To reduce stress, the availability of relevant and reliable clinical information to 'frontline nurses' should be disseminated in a timely manner (Brodrick et al., 2020; Digby et al., 2021; Moore, 2020). Fortgang (2021) and Abbu (2021), both offering advice as leaders in the United States to clinical leaders, posit that in addition to reducing stress, it would build trust between nurses and leaders. However, reporting conversations with senior nurse leaders in the United Kingdom, Allen (2020) emphasized that rather than being the only form of emotional support available to nurses, leaders need to be able to signpost staff to available institutional support services. They can implement supportive measures, for example, ensuring safe staffing and adequate breaks (Allen, 2020; Catania et al., 2021; Croke, 2020) and are well-placed to disseminate available support available within organizations. The importance of resources, such as wobble rooms, open forums, emotional hygiene programmes, counselling and mindfulness, was highlighted throughout the literature as necessary to support nurses transitioning from a prolonged state of crisis to a new normal (Croke, 2020; Hofmeyer & Taylor, 2021; Markey et al., 2021; Rossa et al., 2020). The reduction of nurse psychological harm has benefits not only for individuals but also for the wider organization, as nurses with negatively impacted mental wellbeing will be unproductive, burnt out and unable to provide the best possible care (Croke, 2020; Hofmeyer & Taylor, 2021; Merchant, 2021).

5 | KEY ISSUES

The larger HeaLiN project will use qualitative and quantitative data to synthesize and further refine the identified theories. Data synthesis within the scope of this RRR has revealed mechanisms or interventions; leaders are encouraged to use that contribute to healthful outcomes are varied. They use multiple means of communicating with nurses both in person and remotely. By being engaging, motivating and using facilitative practices, they can be responsive to individuals and teams' needs. They ensure nurses are prepared for their role through training and creating learning spaces and have the practical support they need. According to the literature, these mechanisms contribute to supportive environments that promotes autonomy, wellbeing, learning and collaborative practices. The contexts that enable leaders to employ these strategies are concerned with who they are as leaders, their self-awareness and the attention they give to their own wellbeing. The attributes of healthful leadership emerge as authenticity, embodying values such as compassion, honesty, openness, humility, respect, vulnerability and courage, and these are aligned with organizational values.

Despite the call from prominent nurse leaders (Rosser et al., 2020; West et al., 2020) at the beginning of the COVID-19 pandemic for nurse wellbeing to be at the centre of decision-making, the literature suggests leaders appear not to have promotion of healthfulness as a core intent, although it is implicit in the findings. This may be due to the absence, in the main of any theoretical

frameworks to guide interpretation of leadership strategies required during the pandemic. There is also little acknowledgement of the role of the macro culture and context that helps leaders to practise in these ways, rather the emphasis is on leadership attributes. According to Cardiff et al. (2018) and McCormack and McCance (2021), this is only one level of context; supportive, learning environments are also key. A new attribute, vulnerability is a new finding, which may be linked to courage and of relevance during crises. Although not explicit, Theory 2 suggests emotional intelligence, demonstrated by equanimity.

Healthful strategies identified in the literature includes fostering engagement. It also highlights being facilitative which leads to collaborative practices. According to McCormack and McCance (2021), collaborative practices and shared-decision-making are healthful strategies, rather than outcomes, although shared decision-making may be embedded in facilitative practices as in Theory 2: Being open and engaging, Cardiff et al. (2018) in their action research study identified practices of sensing (What is going on), presencing (authentic attentiveness and responsiveness), balancing the needs of all persons and contextualizing, concerned with understanding the others' personhood. Presencing may be embedded in visibility (Theory 1), which has the intention of understanding the team's needs, resonating wbalancing. Theory 4: Embodying values resonates with the work of West et al. (2020) who contended that key to healthfulness is nurses feeling they have autonomy, which enables them to work consistently with their values. This theory however also identifies being sympathetically present and creating learning spaces as interventions consistent with Cardiff et al.'s (2018) model but adds responsiveness as a leadership strategy. Other leadership strategies such as advocacy at a strategic level, finding different and multiple ways of communicating in timely ways, innovative resources, for example, wobble rooms and signposting wellbeing service to nurses, are also new findings in this review. Although healthful leadership strategies, reflecting relational leadership, are identified in the literature, there was an emphasis on the need for leaders to understand self and be adequately prepared. Theory 3 focusing on leaders only being able to care for others if they care for themselves also resonates with West et al. (2020). They suggest that this enables others to feel valued and that they are making a valued contribution to their work, whereas the findings in this review suggest this enables nurses to engage in wellbeing practices. Innovation as an outcome of healthful leadership has emerged in the literature, but nurses being able to maximize their potential in line with their values has not explicitly (McCormack & McCance, 2021). This may reflect a more pragmatic approach advocated by nurse leaders at the beginning of the pandemic, ensuring nurse preparation and learning, but this had less intention of enabling nurses to flourish, although autonomy is a suggested outcome. The lack of nurse voice makes this difficult to a certain: Healthful outcomes appear to be less focused on nurses flourishing and more concerned with reducing psychological harm, promoting resilience and boosting morale. We therefore acknowledge a limitation of this review as the nature of current evidence means that there is a degree of assumption about the important mechanisms, which are enabled when contextual factors are at

play and the range of outcomes this leads to. There is a paucity of research evidence. Much of the literature is opinion based and prominently from North America. However, convergence of findings in the literature have provided indicators to develop tentative theories as to the factors, which may promote nurses and midwives' wellbeing and healthfulness during and after a pandemic, and these will be explored in phase two of this study.

6 | CONCLUSIONS

A gap in the literature are the perspectives of nurses' and midwives' regarding the influence of nurse leadership on their wellbeing and healthfulness This review found leaders do not make healthful practices a specific leadership intent, nor do they give context full attention as an enabler of healthfulness. The literature does not address the role of the macro context on healthful leadership practices, rather relies on leaders' attributes and attention to promoting wellbeing of nurses and midwives. Healthful outcomes do consider context for nurses and midwives as they aim to create supportive environments that promotes autonomy, wellbeing, learning and collaborative practices. Leaders however need to adapt their leadership practices to influence healthful outcomes.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

The findings from this review have highlighted several factors that may promote nurses' and midwives' wellbeing and healthfulness. In addition to providing adequate resources, for example, in terms of staffing levels and learning spaces, the literature suggests that nurse leaders need to be adequately prepared to facilitate a healthful working environment to support nurses' and midwives' wellbeing, so that they may be able to provide high-quality care. Ensuring a supportive organizational culture, which embodies the values of healthfulness, may help to mitigate the impact of the COVID-19 pandemic on nurses' and midwives' wellbeing in the immediate aftermath and going forward.

CONFLICTS OF INTEREST

The authors know of no known conflicts of interest.

ETHICS STATEMENT

Ethical approval was not required for this work as the evidence reviewed was all published. No data was gathered.

DATA AVAILABILITY STATEMENT

Data are available on request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

ORIGINAL ARTICLE

WILEY

Association between coping strategies and professional quality of life in nurses and physicians during COVID-19: A cross-sectional study

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Abstract

Aim: To explore the associations between coping strategies (social support, avoidance strategies, positive attitude, problem orientation, and transcendent orientation) and professional quality of life (compassion satisfaction, burnout, and secondary traumatic stress) of nurses and physicians during COVID-19.

Background: Little is known about the association between the way health care workers cope with stress and their professional quality of life during the unusual circumstances that the COVID-19 pandemic imposed.

Methods: A single-centre cross-sectional observational study was conducted with health care professionals ($n = 143$). The Professional Quality of Life scale Version 5 and the Italian Version of the Coping Orientations to the Problems Experienced measured the professional quality of life and coping strategies, respectively.

Results: Avoidance, problem orientation and social support coping worsened professional quality of life, whereas a positive attitude improved it.

Conclusions: This study on the relationship between coping strategies and the professional quality of life during health emergencies like the COVID-19 pandemic can inform interventions aiming to foster functional coping strategies in health care personnel to sustain their professional quality of life.

Implications for Nursing Management: Identifying people at greater risk of burnout and secondary traumatic stress can guide tailored interventions to improve health care workers' wellbeing. Increased professional quality of life might turn in improved quality of care and reduced absenteeism and intention to leave.

KEYWORDS
coping, COVID-19, nurses, physicians, professional quality of life

1 | INTRODUCTION

The COVID-19 (Coronavirus disease) pandemic changed people's lives due to mass restrictions, social isolation and economic recession (Xiong et al., 2020). This situation has led to an increase of mental and psychological disorders in the global population, which developed anxiety and depressive symptoms (Luo et al., 2020; Marvaldi et al., 2021). The worst impact on mental health was found in health care professionals who were exposed to additional potentially traumatic or stressful factors due to COVID-19 psychosocial strain (Buselli et al., 2020; Magnavita et al., 2022), post-traumatic stress symptoms, witnessing numerous deaths and high workloads (Marvaldi et al., 2021).

Worse mental health negatively affects the professional quality of life (An et al., 2020; Suryavanshi et al., 2020). The professional quality of life is the quality of life perceived in relation to work and investigates both the positive and negative aspects of helping others (Kim et al., 2015). In literature, multiple tools are used to measure the professional quality of life among health professionals (Kandula & Wake, 2021). According to our chosen framework (Stamm, 2010), the professional quality of life of health care professionals accounts for the positive and negative aspects: compassion fatigue and compassion satisfaction. Compassion fatigue has two components: burnout and secondary traumatic stress. Burnout comprises emotional exhaustion, depersonalization, a negative attitude, a lack of personal fulfilment and frustration, whereas secondary traumatic stress is the negative feeling driven by fear and work-related trauma (Hinderer et al., 2014; Hooper et al., 2010; Hunsaker et al., 2015; Peters, 2018). Compassion satisfaction is a protective mechanism that stems from the satisfaction of helping others, from fulfilment and from reward because of caring for patients (Hinderer et al., 2014; Hooper et al., 2010).

Compassion fatigue (secondary traumatic stress and burnout) was found to be high in professionals who worked closely with COVID-19 patients (Buselli et al., 2020; Galanis et al., 2021; Orrù et al., 2021; Ortega-Galán et al., 2020; Ruiz-Fernández et al., 2020; Trumello et al., 2020). Nevertheless, compassion satisfaction of frontline workers, who are directly responsible for COVID-19 patients, was equal to or higher than that of those working in other wards or contexts (Buselli et al., 2020; Ortega-Galán et al., 2020; Trumello et al., 2020). To deal with the negative effects caused by COVID-19, coping could play a key role to improve the professional quality of life.

Coping is a complex and multidimensional process that has been defined as thoughts and behaviours used to manage the internal and external demands of situations that are appraised as stressful (Folkman & Moskowitz, 2004), being one of the main defences to protect mental health (Dehghani et al., 2018; Huang et al., 2020). Coping, according to our chosen conceptualization, includes five conceptual domains: social support (seeking understanding, seeking information and emotional release), avoidance strategies (denial, humour, use of drug/alcohol, behavioural disengagement and mental detachment), a positive attitude (acceptance, containment and positive reinterpretation), problem orientation (suppression, planning and activity) and transcendent orientation (spirituality and religion) (Foà et al., 2015; Huang et al., 2020; Sica et al., 2008).

During the COVID-19 pandemic, a positive attitude in nurses and physicians towards stressful situations was a strong protective factor for stress, whereas seeking social support and avoidance-based strategies were risk factors (Babore et al., 2020; Cai et al., 2020). However, other studies have shown that avoidance strategies like emotional disengagement significantly reduced psychological distress and post-traumatic stress disorder (Labrague, 2021). The professional quality of life was not assessed in these studies, and the association between coping strategies and the professional quality of life in nurses and physicians during COVID-19 is currently unknown. Some previous studies, conducted before COVID-19, have investigated the association between quality of life and coping using different tools to measure the two concepts. They showed that coping strategies like problem orientation and social support could enhance compassion satisfaction, whereas avoidance-based strategies could increase burnout (Al Barmawi et al., 2019; Portero de la Cruz et al., 2020). However, knowing the relationship between coping and the professional quality of life during COVID-19 can inform and design specific interventions to promote effective coping strategies among professionals during emergencies that extend over time. This could potentially improve the professional quality of life of frontline nurses and physicians and prevent burnout and damaging mental health effects. Therefore, this study aimed to explore the associations between coping strategies (social support, avoidance strategies, positive attitude, problem orientation and transcendent orientation) and the professional quality of life (compassion satisfaction, burnout and secondary traumatic stress) in nurses and physicians during COVID-19.

2 | METHODS

This study uses a single-centre cross-sectional design. The study was conducted in a general public hospital in a large metropolitan city in the north of Italy. The hospital performs around 46,000 hospitalizations and 3 million outpatient services per year.

2.1 | Participants and procedures

Between April and May 2021, all the 185 health care professionals working in the Emergency department, Pulmonology department, and Haematology and Bone Marrow Transplant Centre were invited to participate in a cross-sectional online survey by invitation on their institutional email addresses. One author of the study (JGC) personally contacted nurses and physician managers of the three selected wards. The managers then sent all the nurses and physicians working in these three wards ($n = 185$) the email containing the presentation of the study and the survey. The managers also sent an email reminder every 15 days for a total of four emails. The three departments included three different COVID-19 patient status conditions: only COVID-19 positive (Pulmonology department), only COVID-19 negative

(Haematology and Bone Marrow Transplant Centre) and both COVID-19 positive and COVID-19 negative (Emergency department).

Inclusion criteria were being a nurse or a physician and having been working at the bedside for at least 6 months before the survey administration. No exclusion criteria were applied. Formal consent was obtained from each participant via the survey, and mandatory screening questions at the beginning of the survey assessed participants' eligibility. The questionnaires were anonymous, and no compensation for participation was provided.

2.2 | Measures

Participants' sociodemographic characteristics were collected by a self-report questionnaire, including gender, age, marital status, children, professional seniority, unit and COVID-19 infection status.

The professional quality of life was measured with the Italian version of the Professional Quality of Life scale Version 5 (ProQOL-5) (Palestini et al., 2009; Stamm, 2010). The ProQOL-5 is a 30-item self-report questionnaire measuring three aspects of the professional quality of life. The positive aspect of ProQOL-5 is *compassion satisfaction* and represents the pleasure derived from helping others through work. *Burnout* is the negative effect of caring that shows as exhaustion, frustration, anger and depression related to work and usually has a gradual onset. *Secondary traumatic stress* is the other negative aspect of ProQOL and is about feeling fear in relation to work-related primary or secondary trauma. The compassion satisfaction subscale encompasses the positive aspects of helping others who have experienced suffering, whereas the burnout and the secondary traumatic stress subscales assess its negative consequences (*compassion fatigue*). Each subscale is unique and counts 10 items asking to indicate how frequently participants experienced a set of emotions or events in the previous 30 days to be rated on a 5-point Likert scale ranging from $0 = never$ to $5 = very\ often$. Higher scores on compassion satisfaction indicate that respondents are experiencing better satisfaction with their ability to provide care. Higher scores on burnout and secondary traumatic stress indicate that the respondents are at higher risk of experiencing symptoms of burnout and secondary traumatic stress, respectively. Validity was calculated from data from over 200,000 participants across the globe, and the ProQOL-5 was found to be valid and reliable in several contexts and accounts for sociodemographic differences (Stamm, 2010). In Stamm (2010), the Cronbach's alpha was .88 for compassion satisfaction, .75 for burnout and .81 for secondary traumatic stress. In this study, we confirmed good reliability for each ProQOL-5 subscale: burnout ($\alpha = .779$), secondary traumatic stress ($\alpha = .819$) and compassion satisfaction ($\alpha = .904$) scales.

Participants' trait coping strategies, that is, the usual way people cope with stress, were assessed with the Italian Version of the Coping Orientations to the Problems Experienced (COPE-NVI) (Carver et al., 1989; Foà et al., 2015). COPE-NVI is a multidimensional inventory comprising 60 items evaluating how often the subject uses a set of particular coping processes in difficult or stressful situations and is rated on a 4-point scale ranging from $1 = I\ usually\ do\ not\ do\ this\ at\ all$

to $4 = I\ usually\ do\ this\ a\ lot$. The instrument includes five subscales corresponding to five different coping styles: *social support*, *avoidance strategies*, *positive attitude*, *problem orientation* and *transcendent orientation*. Social support is about seeking moral support from friends and relatives, trying to ask other advice on what to do, looking for the understanding of someone and solidarity. Avoidance strategies concern the abandonment of any attempt to act, the tendency to distract with alcohol and substances and the refusal to believe what happened. Positive attitude strategies involve learning to live with the problem, accepting the reality of the facts and looking for the positive side of events as something constructive. Problem orientation is about focussing on the problem and avoiding what may interfere with efforts to address the problem. Finally, transcendent orientation concerns praying and placing one's hope in God and trying to find comfort in religion. A higher score on a particular subscale indicates greater use of that specific coping strategy. COPE-NVI has shown good psychometric properties (Babore et al., 2020), measuring reliably social support ($\alpha = .91$), avoidance ($\alpha = .70$), a positive attitude ($\alpha = .76$), problem orientation ($\alpha = .83$) and transcendent orientation ($\alpha = .85$) (Sica et al., 2008). The Cronbach's alpha of factors in our study ranged from .78 to .86.

2.3 | Statistical method

Sociodemographic characteristics were described by means, standard deviations and frequency distribution in the overall sample and by profession (physicians vs. nurses). Chi-square test, z-score test for proportions and unpaired t test or Mann–Whitney U test, when assumptions of normality were violated, were used to compare subgroups and explore possible gender differences. Effect size was measured by Cohen's d. Bivariate analyses were carried out to explore the association between the investigated variables. A set of one-way analyses of variance was used to explore differences in professional quality of life dimensions between physicians and nurses working in the three different settings described above (only COVID-19 positive, only COVID-19 negative and both COVID-19 positive and negative patients). Finally, multiple linear regression models were used to assess associations between coping strategies and professional quality of life dimensions. Model selection included major sociodemographic and professional factors such as gender, professional role and seniority, and those variables were found to have a significant relationship ($p < .1$) in bivariate analysis. We then used an iterative backward selection process examining p values to derive a parsimonious model (statistical significance was set at $p < .05$). All data analyses were performed using the statistical software package SPSS 27.0.

3 | RESULTS

A total of 143 health care professionals consented to participate and completed the survey (response rate: 77.3%). Participants' demographic characteristics, professional information and

TABLE 1 Descriptive sociodemographic characteristics, professional quality of life, professional information and health-related features

	Total ($n = 143$)	Physicians ($n = 48$)	Nurses ($n = 95$)	p value
Gender				
Female (%)	89 (62.2%)	30 (62.5%)	59 (62.1%)	$z = .046$, ns
Age				$\chi^2 (3) = 8.244\ p = .041$
20–29	24 (16.8%)	3 (6.3%)	21 (22.1%)	
30–39	83 (58%)	34 (70.8%)	49 (51.6%)	
40–49	21 (14.7%)	8 (16.7%)	13 (13.7%)	
50–59	15 (10.5%)	3 (6.3%)	12 (12.6%)	
Marital status				
Single	39 (27.3%)	15 (31.3%)	24 (25.3%)	$\chi^2 (5) = 1.423\ p = .922$
Married	43 (30.1%)	14 (39.2%)	29 (30.5%)	
De facto	54 (37.8%)	17 (35.4%)	37 (38.9%)	
Divorced	2 (1.4%)	1 (2.1%)	1 (1.1%)	
Engaged	4 (2.8%)	1 (2.1%)	3 (3.2%)	
Widow(er)	1 (.7%)	-	1 (1.1%)	
Children—yes	58 (40.6%)	17 (35.4%)	41 (43.2%)	$z = -.890$, ns
Professional seniority				
<10	79 (55.2%)	29 (60.4%)	50 (52.7%)	$\chi^2 (3) = 6.222\ p = .101$
10–19	44 (30.8%)	17 (35.4%)	27 (28.4%)	
20–29	14 (9.8%)	2 (4.2%)	12 (12.6%)	
≥30	6 (4.2%)	-	6 (6.3%)	
Currently working in an unit that mainly manages patients:				
Covid-19−	28 (19.6%)	12 (25%)	16 (16.8%)	$\chi^2 (2) = 2.388\ p = .303$
Covid-19+	34 (23.8%)	13 (27.1%)	21 (22.1%)	
Both	81 (56.6%)	23 (47.9%)	58 (61.1%)	
Ever resulted COVID-19 positive				
Yes	53 (37.1%)	13 (27.1%)	40 (42.1%)	$z = -1.756$, ns
Professional quality of life				
Compassion satisfaction	36.1 ± 7	35.6 ± 6.3	36.4 ± 7.4	$t(141) = -.620, p = .536$ $CI_{95} -3.25, 1.69, d = -.11$
Burnout	25 ± 6.4	26.6 ± 5.7	24.3 ± 6.5	$t(141) = 2.194, p = .030$ $CI_{95} .24, 4.63, d = -.39$
Secondary traumatic stress	21 ± 6.8	22.6 ± 6.9	20.2 ± 6.6	$t(141) = 2.039, p = .043$ $CI_{95} .07, 4.75, d = -.361$
Coping strategies				
Social support	27.3 ± 6.9	28.8 ± 7.3	26.5 ± 6.7	$t(141) = 1.854, p = .066$ $CI_{95} -.15, 4.66, d = .33$
Avoidance strategies	22.9 ± 4.9	23.1 ± 4.8	22.8 ± 4.9	$t(141) = .351, p = .726$ $CI_{95} -1.41, 2.02, d = .06$
Positive attitude	31.5 ± 5.4	32.1 ± 4.5	31.2 ± 5.9	$t(141) = .938, p = .350$ $CI_{95} -1.0, 2.81, d = .17$
Problem orientation	27.7 ± 5.4	28.8 ± 4	27.2 ± 6	$t(141) = 1.655, p = .100$ $CI_{95} -.31, 3.471, d = .29$
Transcendent orientation	20.1 ± 3.9	19.4 ± 4.4	20.5 ± 3.6	$t(141) = -1.545, p = .125$ $CI_{95} -2.43, .29, d = -.27$

Abbreviation: CI = confidence interval.

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TABLE 2 Coping strategies and professional quality of life dimensions by gender

	Total (n = 143)	Female (n = 89)	Male (n = 54)	p value
Professional quality of life				
Compassion satisfaction	36.1 ± 7	35.5 ± 7.1	37.1 ± 6.8	$t(141) = 1.319, p = .189$ $CI_{95}-3.25, 1.69, d = .29$
Burnout	25 ± 6.4	25.2 ± 6.5	24.8 ± 6.1	$t(141) = -.393, p = .695$ $CI_{95}-3.25, 1.69, d = .29$
Secondary traumatic stress	21 ± 6.8	21.9 ± 7.1	19.6 ± 5.9	$t(141) = -1.966, p = .051$ $CI_{95}-3.25, 1.69, d = .29$
Coping strategies				
Social support	27.3 ± 6.9	28.7 ± 7.1	24.9 ± 5.9	$t(141) = -3.285, p = .001$ $CI_{95}-5.73, -1.29, d = -.52$
Avoidance strategies	22.9 ± 4.9	22.6 ± 4.4	23.3 ± 5.5	$t(141) = .897, p = .371$ $CI_{95}-.59, 2.71, d = .21$
Positive attitude	31.5 ± 5.4	31.3 ± 5.6	31.7 ± 5.1	$t(141) = .377, p = .706$ $CI_{95}-1.62, 2.0, d = .03$
Problem orientation	27.7 ± 5.4	27.3 ± 5.5	28.4 ± 5.3	$t(141) = 1.249, p = .214$ $CI_{95}-.41, 3.14, d = .25$
Transcendent orientation	20.1 ± 3.9	21.1 ± 3.7	18.6 ± 3.7	$t(141) = -3.818, p < .001$ $CI_{95}-3.85, -1.32, d = -.68$

Abbreviation: CI, confidence interval.

TABLE 3 Multiple linear regression analyses exploring the influence of coping strategies on professional quality of life dimensions

	B (SE)	β	95% CI for B		p	R^2	ΔR^2
			LL	UL			
Professional quality of life—compassion satisfaction							
Model						.338	.299
Constant	18.27 (5.04)		8.296	28.24	.000		
Gender	−2.19 (1.18)	−.151	.-4.5	.131	.064		
Professional role	.994 (1.09)	.067	−1.153	3.142	.361		
Professional seniority	1.371 (.64)	.161	.107	2.63	.034		
Social support	.046 (.087)	.045	−.126	.218	.599		
Avoidance strategies	−.224 (.106)	−.155	−.434	−.014	.037		
Positive attitude	.665 (.140)	.514	.389	.942	.000		
Problem orientation	.003 (.149)	.003	−.291	.298	.982		
Transcendent orientation	.016 (.141)	.009	−.264	.296	.908		
Professional quality of life—burnout							
Model						.295	.253
Constant	26.058 (4.692)		16.778	35.338	.000		
Gender	2.142 (1.09)	.164	−.014	4.298	.052		
Professional role	−1.701 (1.01)	−.127	−3.7	.297	.095		
Professional seniority	−1.439 (.595)	−.188	−2.616	−.263	.017		
Social support	−.071 (.081)	−.078	−.231	.089	.381		
Avoidance strategies	.468 (.099)	.360	.272	.663	.000		
Positive attitude	−.599 (.130)	−.513	−.857	−.342	.000		
Problem orientation	.472 (.139)	.404	.198	.746	.001		
Transcendent orientation	−.115 (.132)	−.071	−.375	.146	.384		

(Continues)

TABLE 3 (Continued)

	B (SE)	β	95% CI for B LL	UL	p	R^2	ΔR^2
Professional quality of life—secondary traumatic stress							
Model						.320	.279
Constant	.178 (4.91)		−9.526	9.882	.971		
Gender	2.136 (1.14)	.154	−.119	4.391	.063		
Professional role	−1.614 (1.057)	−.113	−3.704	.475	.129		
Professional seniority	−.461 (.622)	−.056	−1.691	.769	.460		
Social support	.171 (.085)	.175	.003	.339	.046		
Avoidance strategies	.591 (.103)	.427	.386	.795	.000		
Positive attitude	−.274 (.136)	−.220	−.543	−.004	.046		
Problem orientation	.307 (.145)	.247	.021	.594	.036		
Transcendent orientation	.137 (.138)	.079	−.136	.409	.323		

Note: In bolds p values < .05.
Abbreviations: B, beta; SE, standard error; CI, confidence interval; LL, lower limit; UL, upper limit.

COVID-19-related information are presented in Table 1. Overall, around 60% of participants were female, 40% had children and slightly less than 70% were married or in a de facto relationship. About 50% reported seniority up to 10 years, and nurses represented 66% of the study participants. Nurses were slightly older than physicians ($\chi^2[3] = 8.244$ $p = .041$). Less than 40% of participants reported being COVID-19 positive at some point. Coping strategies' and professional quality of life dimensions' values by professional role are reported in Table 1. Nurses disclosed statistically significant lower levels of burnout and secondary traumatic stress compared with physicians.

Further, Cohen's effect size values ($d = .39$ and $d = .36$, respectively) suggested a small effect. The mean values for compassion satisfaction were not significantly different for nurses compared with physicians. Compared to their male counterpart, female health care workers reported more often availing social support and turning to religion to manage stressful situations. No gender differences emerged in the dimensions (Table 2).

No statistically significant differences emerged between health care workers caring for the three COVID-19 patient status condition groups (only COVID-19 positive, only COVID-19 negative and both COVID-19 positive and COVID-19 negative) for compassion satisfaction F(2, 140) = .300 $p = .741$; burnout F(2, 140) = .133 $p = .875$; and secondary traumatic stress F(2, 140) = .470 $p = .626$. The multiple regression model statistically significantly predicted compassion satisfaction, F(8, 134) = 8.57, $p < .001$, adj. $R^2 = .29$. Professional seniority, a positive attitude and avoidance coping strategies added statistically significantly to the prediction, $p < .05$. Professional seniority, a positive attitude, problem orientation and avoidance coping strategies statistically significantly predict burnout F(8, 134) = 7.024, $p < .001$, adj. $R^2 = .253$. Secondary traumatic stress was significantly associated with avoidance, problem orientation, social support and a positive attitude F(8, 134) = 7.866, $p < .001$, adj. $R^2 = .279$. Regression coefficients and standard errors can be found in Table 3.

4 | DISCUSSION

The study aimed to explore the associations between coping strategies (social support, avoidance strategies, positive attitude, problem orientation and transcendent orientation) and the professional quality of life (compassion satisfaction, burnout and secondary traumatic stress) among nurses and physicians during COVID-19. To the best of our knowledge, this is the first study to do so. We found that coping strategies used by health care professionals might affect compassion satisfaction and compassion fatigue (burnout and secondary traumatic stress) in the current pandemic. In particular, avoidance worsens the professional quality of life increasing burnout and secondary traumatic stress and reducing compassion satisfaction. Also using problem orientation and social support lead to a similar result, increasing burnout and secondary traumatic stress. Lastly, a positive attitude improved the professional quality of life, reducing burnout and secondary traumatic stress and improving compassion satisfaction. This is relevant because the professional quality of life could be improved by interventions focussed on enhancing functional coping strategies.

A positive attitude and avoidance coping strategies were positive and negative predictors of compassion satisfaction, respectively. This is coherent with previous research conducted before the COVID-19 pandemic (El-Shafei et al., 2018; Hinderer et al., 2014). It is possible that the positive reinterpretation of events and critical processing fostered greater psychological wellbeing (Babore et al., 2020; Cai et al., 2020; El-Shafei et al., 2018), whereas the use of denial, humour, substance abuse and behavioural and mental disengagement affected stress and anxiety (Babore et al., 2020; El-Shafei et al., 2018; Hinderer et al., 2014; Labrague, 2021; Savitsky et al., 2020).

Avoidance and problem orientation were positive predictors of compassion fatigue. Although the negative mechanism of avoidance on the professional quality of life is coherent with previous literature (Babore et al., 2020; El-Shafei et al., 2018; Hinderer et al., 2014; Labrague, 2021; Savitsky et al., 2020), problem orientation has

previously been positively associated with compassion satisfaction, therefore reducing compassion fatigue (Al Barmawi et al., 2019; El-Shafei et al., 2018). It is possible that the unpredictability of the COVID-19 pandemic affected problem orientation, making health care professionals feel inadequate to control the situation and their perception of problem-solving abilities (Babore et al., 2020).

Social support was a positive predictor of secondary traumatic stress, a dimension of compassion fatigue. This is in contrast with previous literature, in which social support significantly reduced stress (Labrague, 2021; Luo et al., 2020; Sanghera et al., 2020; Spoorthy et al., 2020) but partly coherent with a recent study conducted during the pandemic that found an association between higher social support and higher stress (Babore et al., 2020). This negative role of social support could be explained by focussing on the definition of social support by the COPE-NVI scale, which also includes information seeking. In the current pandemic, information was often conflicting and contradictory, there was fake and misleading news from various sources, including institutional ones and exposure to social media and COVID-19 news caused anxiety and stress, increasing fears and producing cognitive overload from infodemic (Fan & Smith, 2021; Mohammed et al., 2021; Savitsky et al., 2020). Furthermore, society's reaction towards health care professionals was not always positive. After the first wave of support and recognition for the work and effort of health care professionals (Portero de la Cruz et al., 2020), there was a progressive decrease in this social recognition combined with the increase of a pandemic and vaccine denier movement (Giordani et al., 2021; Herrera-Peco et al., 2021), and health care professionals were victims of insults and threats and were accused of propaganda, which might justify the role of society in secondary traumatic stress (Bagcchi, 2020; Chirico et al., 2022; Ford, 2021). Lastly, social distancing rules and fear of infecting loved ones might have increased work-related fear and trauma (Babore et al., 2020).

Seniority was a positive predictor of compassion satisfaction and a negative predictor of burnout. Staff with more experience probably developed protective mechanisms to reduce stress and hence burnout and to increase job satisfaction, whereas less experienced professionals are more vulnerable to facing difficult situations and tend to develop more stress and anxiety in dealing with daily challenges in a constantly unstable work environment, coherently with results from previous studies (Galanis et al., 2021; Hunsaker et al., 2015; Kelly et al., 2015; Portero de la Cruz et al., 2020).

Burnout and compassion satisfaction overall values were moderate, whereas secondary traumatic stress was low in our sample, in line with the results identified in the pre-pandemic era (Kelly et al., 2015). This is in contrast with previous studies that highlighted how health care professionals have recorded higher levels of stress, anxiety and depression as well as burnout and secondary traumatic stress during the COVID-19 pandemic (Galanis et al., 2021; Li et al., 2021; Marvaldi et al., 2021; Pappa et al., 2020; Sanghera et al., 2020; Varghese et al., 2021; Vindegaard & Benros, 2020). This difference might be explained by the time during which our study was conducted. We collected data between April and May 2021, towards the end of the third COVID-19 wave in Italy and in the middle of the first vaccination campaign. The protection against infection from SARS-CoV-2 by vaccines, the decrease in mortality rates and the lower number of hospitalizations may have helped in relieving stress and anxiety symptoms in health professionals, leading to lower secondary traumatic stress and burnout levels.

Finally, female health care professionals used significantly more transcendent orientation and social support than males. This is coherent with previous studies that have shown gender differences in coping abilities (Cai et al., 2020). In fact, women are more likely to develop social and personal mechanisms to cope with stress than men, and they are likely to perform coping strategies that can release emotional stress by searching for support from colleagues, family and friends (Cai et al., 2020; Huang et al., 2020; Sica et al., 2008; Xiong et al., 2020). Lastly, unlike what emerged from recent systematic reviews (Danet Danet, 2021; Pappa et al., 2020), who found higher levels of burnout, stress, anxiety and depression among nurses than other health care professionals, within our study, physicians reported more compassion fatigue than nurses. This result is surprising; it may be linked to the ability to deal with powerlessness and uncertainty and should be further investigated.

4.1 | Limitations and strengths

Due to the lack of consensus on the concepts of coping and the professional quality of life, several instruments are used throughout the literature for both concepts. This could hinder the comparison of results among different theoretical conceptualizations. However, in our study, we used the ProQOL-5 and COPE-NVI scales, which are both widespread and validated instruments. The cross-sectional nature of the study does not allow assuming causality, and it was a monocentric study conducted on a sample of 143 nurses and physicians. Furthermore, the level of coping and the professional quality of life were not known in this population before the pandemic.

Mixed methods longitudinal studies with bigger and more diverse samples are required to better understand the relationship between coping and the professional quality of life. Furthermore, multiple variables should be considered for their mediating of confounding effects. Nevertheless, this is the first study that evaluated the association between the COPE-NVI and ProQOL-5 scores in nurses and physicians during the pandemic and that did so with a rigorous methodology, so our findings can be considered robust and generalizable to similar populations.

5 | CONCLUSIONS

Nurses and physicians reported moderate levels of burnout and compassion satisfaction. Furthermore, coping strategies used by health care professionals affected compassion satisfaction, burnout and secondary traumatic stress in the current pandemic. Further studies are needed to corroborate our data, also using a bigger and more diverse sample with different health care professionals and with

longitudinal mixed methods designs. Furthermore, future studies should also consider the effect on the professional quality of life of other occupational stressors, such as horizontal and vertical violence against health care professionals, overworking and staffing.

6 | IMPLICATION FOR NURSING MANAGEMENT

Knowing which coping strategies and sociodemographic characteristics affect the professional quality of life can help managers identify those people more at risk of burnout and secondary traumatic stress. In particular, in our results, avoidance, problem orientation and social support coping worsened the professional quality of life, whereas a positive attitude improved it. These results could help management to design specific interventions and proactive strategies to improve the workers wellbeing and to minimize the level of compassion fatigue and burnout. Future research should focus on understanding which interventions are better at increasing the professional quality of life.

CONFLICTS OF INTEREST
The authors have no conflicts of interest to disclose in relation to this manuscript.

ETHICS STATEMENT
The study was approved by the Ethical Committee of the IRCCS Ca' Granda Ospedale Maggiore Policlinico Milano (Approval number: 309_2021). Participants were informed about the study before accessing the questionnaire, and they could leave the questionnaire at any time during completion. Health care professionals were not compensated for their participation in the study, and participation was voluntary. Data were collected anonymously, and all participants gave their consent electronically before entering the questionnaire.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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ORIGINAL ARTICLE

WILEY

Managing health care under heavy stress: Effects of the COVID-19 pandemic on care unit managers' ability to support the nurses—A mixed-methods approach

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Abstract

Aim(s): This study aims to investigate care unit managers' perceptions of how the COVID-19 pandemic influenced their ability to support the nurses.

Background: The COVID-19 pandemic placed extreme pressure on health care organizations. More knowledge regarding how the pandemic influenced care unit managers' ability to support nurses is central to ensuring high-quality health care in future crises.

Method(s): A mixed-methods study in Swedish hospitals with a survey ($n = 128$) and interviews ($n = 20$) with care unit managers.

Results: Approximately half of the managers reported having spent more time available to and supporting the nurses. Availability was positively predicted by their perceived organizational support while negatively by their job demands. These job demands concerned meeting staff anxiety and managing organizational restructuring. Full focus on direct patient care and strong professional and social support were important job resources.

Conclusion(s): For care unit managers to effectively support the nurses during a crisis, they need proficient job resources and moderate job demands. Managers' perceived organizational support positively affects the quality of their crisis leadership. Creating arenas in which staff collegiality can form and develop is beneficial for the ability to meet future crises.

Implications for Nursing Management: This study specifies important job resources that should be acknowledged and reinforced to strengthen the ability of care unit managers to actively support the nurses during a crisis.

KEYWORDS
managers' resources, managers' role stress, perceived organizational support

1 | BACKGROUND

Effective and high-quality health care is a cornerstone of societal welfare. Because health care work is staff-intensive, the health and well-being of the health care professionals is essential for the ability of health care organizations to provide high-quality care with optimal resource utilization (Demerouti et al., 2001; Eklöf et al., 2014; Elarabi & Johari, 2014; Johnson et al., 2018). Registered nurses are fundamental for the provision of high-quality health care at the care units and their work is highly demanding. They participate in the development of the care regimens and are vital for their implementation; they continuously monitor patients' conditions and provide essential information to physicians and other professionals in the care team; and their work is often stressful, with high cognitive and emotional demands (Chang et al., 2005; Douglas et al., 2017; Edwards & Burnard, 2003; Happell et al., 2013; Jimmieson et al., 2017). Therefore, ensuring working conditions that support nurses' ability to perform their work is essential for efficient and high-quality health care. Previous research has identified care unit managers as central to the provision of such working conditions (Gadolin et al., 2021). As such, nurses' sound working conditions are largely dependent on their care unit manager's ability to be available at the care unit and support the nurses. Further, care unit managers themselves have emphasized that their own job demands and resources highly influence this ability, implying that the working conditions of the care unit managers also affect the working conditions of the nurses (Gadolin et al., 2022).

The COVID-19 pandemic immensely increased the demands on health care organizations globally, affecting managers and staff at all levels (e.g., Babore et al., 2020; Eriksson et al., 2021; Sheraton et al., 2020). Nurses were at the care frontline during the COVID-19 pandemic, (Al Thobaity & Alshammari, 2020), and their psychological burden and physical exhaustion was severe (Kishi et al., 2022). Many adverse outcomes associated with poor mental health have been identified among nurses caring for COVID-19 patients, such as high levels of burnout (de Cordova et al., 2022), dysfunctional levels of stress and anxiety (Mo et al., 2020), as well as depression, posttraumatic stress disorder and insomnia (Varghese et al., 2021). It has been suggested that nurses who experienced high levels of organizational and social support during the COVID-19 pandemic have been better equipped to handle the increased demands (Labrague & De los Santos, 2020). However, many nurses feel that such support is lacking (Joo & Liu, 2021). The COVID-19 pandemic also imposed heavy demands on care unit managers who were compelled to constantly adapt to changes and manage uncertainty (Vázquez-Calatayud et al., 2022) and balance the often contradictory needs of the nursing staff and top management (Bianchi et al., 2021), often while experiencing increased levels of stress and exhaustion (White, 2021). Given that care unit managers are central actors to ensure nurses' sound working conditions, both in general (Gadolin et al., 2021) and during the COVID-19 pandemic (Cho et al., 2021; Qotimah et al., 2022), understanding how such pressure influences care unit managers' ability to support the nurses, and organizational stressors and resources that influence this ability, may provide health care organizations with valuable knowledge to meet future crises.

The research aim of the present study was to investigate care unit managers' perceptions of how the COVID-19 pandemic influenced their ability to support the nurses. We did this by addressing the following research questions: (1) How did the COVID-19 pandemic influence care unit managers' availability to support the nurses? (2) How was such availability associated with the care unit managers' own job demands and resources? (3) What specific job demands and resources did the care unit managers experience as influential for their ability to support the nurses during the pandemic?

2 | METHODS

This mixed-methods study comprised a questionnaire survey to all 234 care unit managers ($n = 128$, response rate 55%) at six secondary and tertiary care hospitals in two regions in western Sweden and in-depth interviews with 20 strategically selected care unit managers at these hospitals. Mixed-methods research has a broader focus than single method designs. The present study utilized both methods in order to provide deeper insights regarding the complex and multifaceted effects of the COVID-19 pandemic. The quantitative data focused on establishing descriptive statistics and investigating relationships among study variables. The qualitative data aimed to openly explore the lived experiences of the care unit managers and provide more in-depth contextualized descriptions. Therefore, the mixed-methods design in this study may be described as being convergent (Creswell & Clark, 2017) and the methods as complementary (Greene et al., 1989), compensating for shortcomings in each respective method (cf. Giddings & Grant, 2006).

Interviews were conducted during the first wave of the COVID-19 pandemic in Sweden (April 2020–October 2020), while questionnaire data were collected during the second wave (November 2020–January 2021). Pen-and-paper questionnaires were sent out by mail to the care unit managers' workplaces and were returned directly to the researchers. In the questionnaire, the care unit managers were instructed to consider their work situation during the past 6 months when responding (Figure 1).

Starting in March 2020, the COVID-19 virus spread rapidly in Sweden and admissions to the intensive care units were extensive (Public Health Agency of Sweden, 2022). All hospital care units were affected by the pandemic in one way or another, whether by a lack of staff, reorganization of care and staff, implementation of infection control or development of care for the COVID-19 patients.

2.1 | Ethical considerations

Ethics approval of the study was obtained from the Regional Ethics Committee in Gothenburg (no. 264-18). Informed consent was provided by all participants prior to inclusion in the study. The study was conducted in accordance with the ethical standards set out in the 1964 Declaration of Helsinki and its later amendments.

	Mars 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2021	Jan 2021
Covid-pandemic (wave I and II)											
Interviews: Data collection period (black arrow) and period taken in consideration by the CU-manager (gray shades)											
Questionnaire: Data collection period (black arrow) and period taken in consideration by the CU-manager (grey shades)											

FIGURE 1 Data collection. An overview of the two data collection periods and the period considered by the care unit managers in their statements and in the questionnaire, in relation to the first two waves of the COVID-19 pandemic in Sweden

2.2 | Questionnaire

2.2.1 | Participants

The study sample consisted of 128 care unit managers. Eighty-nine per cent of these were female, with a median age of 51 years ($m = 50.9$, $SD = 7.8$). Most respondents (80%) had been employed by their present regional health care organization for at least 10 years. Fifty-nine per cent of the respondents had held the care unit manager position for more than 5 years. The number of direct subordinates per care unit manager ranged from four to 85, with a median of 34 ($m = 32.7$, $SD = 16.1$).

2.2.2 | Measures

Care unit managers' perceived job demands and resources
Three different types of care unit managers' perceived job demands were measured using items from the Gothenburg Manager Stress Inventory (GMSI) (Eklöf et al., 2010): *organizational stressors* (three items, $\alpha = .63$; sample item 'insufficient resources to manage peak CU loads'), *role stressors* (three items, $\alpha = .63$; sample item 'discord between administrative work, organizational development tasks, and subordinate contacts') and *stressors from the subordinates* (six items, $\alpha = .83$; sample item 'conflicts between subordinates'). All demand items had five fixed response alternatives, ranging from 'never/almost never' (1) to 'always/almost always' (5).

The care unit managers' perceived job resources were measured using two different instruments. Two types of resources were included from the GMSI (Eklöf et al., 2010): *superior managerial support* (four items, $\alpha = .82$; sample item 'my superior manager shows genuine interest in what I do and the problems I face as a manager')

and *peer support* (two items, $r = .78$; sample item 'possibilities to discuss work with colleagues'). All of these resource items had five fixed response alternatives, ranging from 'corresponds very poorly' (1) to 'corresponds very well' (5).

The care unit managers were instructed to consider their work situation during the past 6 months when responding to all of the above job demand and resource items.

The other instrument for measuring job resources was the short version (eight items, $\alpha = .88$) of the survey of perceived organizational support (POS) (Eisenberger et al., 1986; Neves & Eisenberger, 2012). Sample items included 'the organization really cares about my well-being' and 'the organization takes pride in my accomplishments at work'. There were six fixed response alternatives, ranging from 'completely disagree' (1) to 'completely agree' (6). Four negatively worded items were reversed in the analyses.

All demand and resource variables were constructed by deriving the mean values for the items within each factor, with high values indicating high levels of demands and resources, respectively.

Care unit managers' perceptions of the influence of the COVID-19 pandemic on their availability to support their staff
Care unit managers' perceptions of the influence of the COVID-19 pandemic on their possibility to be available and supportive to their staff was assessed using a single item developed within the present study—'Which of the following statements corresponds best with your experience? The COVID-19 pandemic has ...'—with three fixed response alternatives: '... caused me to spend more time being present and supportive to my subordinates', '... forced me to spend less time on supporting my subordinates in their work' and '... not in any tangible way influenced my work in relation to my subordinates'.

2.2.3 | Statistical analysis

The relationship between care unit managers' job demands and resources, and their availability to staff, was investigated by a binary logistic regression. The outcome variable was dichotomized in order to analyse why care unit managers felt that the COVID-19 pandemic had caused them to spend more time on being available and supportive to their staff (as compared to it not influencing their work in relation to their staff, *or* forcing them to spend less time supporting their subordinates). Univariate logistic regression analyses were conducted. These analyses were based on 127 care unit managers with data for the outcome variable. All statistical analyses were conducted using SPSS version 28.0 (IBM Corp., Armonk, NY).

2.3 | Interviews

2.3.1 | Participants

Twenty care unit managers from 11 medical specialties were interviewed in depth (Table 1).

To ensure diversity in the organizational situation and capture diverse perspectives, the care unit managers were selected among those rating their POS as high ($n = 7$), medium ($n = 6$) or low ($n = 7$) in a previously performed questionnaire survey. The two researchers conducting the interviews (CG and MSN) were blinded to this selection. Information regarding the study and its purpose was e-mailed to the potential participants prior to each interview. Twenty participants were considered sufficient in relation to the specificity of the aim and interview questions, participants' specific experience, interviewers' experience and knowledge and the possibility to transfer the knowledge to other contexts (cf. Malterud et al., 2016).

2.3.2 | Interviews and analysis

The interviews with the care unit managers were conducted as part of a comprehensive research project that investigated the specific preconditions of high POS among registered nurses in hospital care, how care unit managers act and organize their work to provide such conditions and the organizational preconditions that enable or hinder such work. During these interviews, we explored how the COVID-19 pandemic had influenced the care unit managers' ability to work supportively. First, we asked the care unit managers to describe in as much detail as possible the three most important aspects associated with the COVID-19 pandemic that had influenced their availability and support to the nurses. Second, we asked the care unit managers if there were any other relevant aspects associated with the COVID-19 that had influenced their availability and support during this period.

To comply with the COVID-19 restrictions, all interviews were performed remotely by phone or computer video conference software (Zoom). The two interviewers (CG and MSN) had extensive experience in qualitative research. Each respective interview was recorded and transcribed verbatim. The complete text material was analysed through qualitative content analysis to systematize the material into descriptive categories (Graneheim & Lundman, 2004). The analysis was inductive, with the intent to capture the lived experiences of the care unit managers supporting nurses during the COVID-19 pandemic. All text was read by three of the authors (CG, MSN and MT) to create an overall understanding of the content. This reading revealed a consistency in the care unit managers' statements, indicating that adequate information power of the data was achieved and affirming that the sample size was sufficient (cf. Malterud et al., 2016). It became apparent during the data analysis that care unit managers' experiences of supporting nurses were deeply rooted and centred around the job demands and job resources they perceived as salient during this period. Through subsequent discussions within the research group, preliminary categories defining these job demands and job resources were identified. All statements that related to each respective job demand and resource were sorted into these categories. The final step of the qualitative analysis was to describe in depth how each specific job demand and job resource had influenced the care unit managers' ability to support the nurses. The analysis was iteratively discussed among the researchers until consensus was reached regarding categorization, content and interpretation and consistency was ensured.

TABLE 1 Characteristics of the participants in the interview study ($n = 20$)

Characteristics	n (%)	Mean (standard deviation)	Range (min/max)
Region X	11 (55%)		
Region Y	9 (45%)		
Age		53 (9.8)	40–66
Gender	Female: 18 (90%)		
	Male: 2 (10%)		
Experience as a CU manager (years)		9.4 (9.4)	2–40
Manager of care unit, medical specialty	Psychiatric acute care 1 (5%); cardiology 1 (5%); oncology 1 (5%); surgery 3 (15%); ambulance 3 (15%); geriatrics/neurology 1 (5%); psychiatric care 4 (20%); forensic psychiatry 2 (10%); internal medicine 2 (10%); acute surgery 1 (5%); urology 1 (5%)		

3 | RESULTS

3.1 | The COVID-19 pandemic's influence on care unit managers' support and availability to nurses

Fifty-nine per cent of the care unit managers indicated that the COVID-19 pandemic had caused them to be more present and supportive towards their staff, while 26% stated less time present and supportive. Fifteen per cent indicated that the pandemic had not influenced their work in relation to their staff.

3.1.1 | The relationship between job demands and stressors and care unit managers' support and availability to nurses

Table 2 presents the results from the univariate binary logistic regression analyses. These results indicated that the outcome 'COVID-19 pandemic leading to care unit managers being more present and supportive to their staff' was significantly and positively associated with the care unit managers' POS (OR = 1.70, 95% CI 1.02, 2.81) and negatively associated with their organizational stressors (OR = 0.54, 95% CI 0.32, 0.91) and role stressors (OR = 0.44, 95% CI 0.26, 0.75). Thus, the chances of spending more time present and supportive were higher for care unit managers perceiving high POS and lower for those perceiving high organizational stressors and/or high role stressors. In these analyses, stressors from the subordinates, number of direct subordinates, seniority as care unit manager, superior managerial support and peer support were not significantly associated with the outcome variable.

3.2 | Care unit managers' perceptions of how job demands and job resources had influenced their support and availability to nurses

All of the interviews showed that the COVID-19 pandemic had placed new and heavy demands on the care unit managers, but that it had also released work resources that enabled crisis management.

TABLE 2 Results from univariate binary logistic regression analyses

	Odds ratio (95% CI)	p
Perceived organizational support	1.70 (1.02, 2.81)	.041
Organizational stressors	0.54 (0.32, 0.91)	.021
Role stress	0.44 (0.26, 0.75)	.002
Stressors from subordinates	0.84 (0.47, 1.51)	.558
Number of direct subordinates	0.99 (0.96, 1.01)	.235
Seniority	1.01 (0.96, 1.06)	.804
Superior managerial support	1.13 (0.74, 1.74)	.572
Peer support	1.39 (0.93, 2.08)	.113

Note: Odds ratios with 95% confidence intervals (CI) for univariate binary logistic regression analyses predicting the outcome variable CU managers' being more present and supportive to subordinates as a consequence of the COVID-19 pandemic.

3.2.1 | Work demands related to restructuring and organizing work

The COVID-19 pandemic changed the working conditions and placed new and increased demands on all managers and staff in the health care organization. It increased the demands on the care unit managers to participate in administrative meetings, which absorbed a lot of time. During the early stages of the pandemic, guidelines changed continuously, which created insecurity and frustration among the staff. At the same time, many local workplace meetings were cancelled. This deprived the workplace of a forum for discussing and solving emerging problems. The care unit managers also described that the authority to make certain types of decisions was moved from them to higher hierarchical levels in the organization, which complicated decision-making and implementation processes for the care unit managers. Patients cancelling their appointments due to the risk of being infected at the hospital also required administration. The pandemic also introduced a new, heavy task of infection tracing at the workplace, which added to the care unit managers' workload.

The sudden and significant increase in acute care assignments induced by the COVID-19 pandemic required staff to be moved within and between care specialties and units. New working procedures for infection protection of patients and staff must also be developed. The nurses were required to manage new patient groups, be transferred to other care units within or beyond their specific competence, work longer and more shifts, work more weekends and postpone planned leave. Also, previously planned improvements, such as increased staffing or improved work schedules, had to be postponed. The care unit managers described how this restructuring work required presence, decision-making skills and sensitivity to the impact on the individual nurses. The care unit managers spent a lot of time preparing staff to feel role secure in the relocation to other departments, through supportive dialogue, information and training. Thoughtful consideration was also necessary to determine which of the staff could be moved to another unit and care for acutely ill COVID-19 patients or manage intensive care.

> Personally, I feel bad about having to pick out six nurse anesthetists and tell them that they had to work at the intensive care unit. It wasn't a question of it being voluntary. I had to order them to go there. It wasn't fun. One of them [a nurse] is not doing well, and we have already sent him to a crisis team. It doesn't feel good. They're not accusing me, but I really feel like I'm the one who's put him in that situation. (Participant 5, Region X)

The COVID-19 pandemic required the care unit managers to promptly make decisions to solve acute disturbances and dilemmas in the workplace, where the information was changeable and uncertain. One manager described the situation as 'leading in limbo'. These situations required swift decisions regarding measures to reduce the spread of infection at the unit, making changes in the staffing, isolating COVID-19 infected patients, reorganizing patient flows due to sick

staff, implementing new guidelines and disseminating information about COVID-19 to the staff.

3.2.2 | Work demands related to the staff

The care unit managers described continuous and swift provision of information as a significant measure for reducing staff anxiety. The staff must be kept informed about the present situation through daily briefings. The care unit managers spent a lot of time sorting through the flow of information, compiling and disseminating the most important parts. They also described that the expectations to provide valid information as challenging: 'The staff wants information and expects you as a manager to be able to give answers'. The less experienced care unit managers perceived this situation to be particularly challenging.

The COVID-19 pandemic made it even more important than usual for the care unit managers to be present at the care unit and enable the staff to express and process insecurity and anxiety related to factual issues regarding the disease and implementation of guidelines and routines for the care it required. Nurses' insecurity was also related to working in new units and specialties with unfamiliar work tasks and personal anxiety regarding the risk of becoming infected. The care unit managers described an anxious climate in the workplace, where a variety of factors escalated staff concerns, such as discussions in the media, limited access to personal protective equipment and a lack of clarity regarding the use of such equipment. These needs must be addressed by acquiring facts, expressing individual concerns, sharing experiences and implementing guidelines. The care unit managers described how they spent much time each day supporting such a process by being present, listening and discussing, acknowledging feelings and following-up on the staff's well-being. Caring for COVID-19 patients was also highlighted as challenging for the nurses. The care unit managers emphasized the importance of being observant and sensitive to the capacity of each individual to manage the situation.

> I check in on their feelings, thoughts, and the concerns they have all the time. You have to be able to talk about feeling uneasy, and that the situation is unpleasant and difficult. You must allow yourself to acknowledge that it is a hard time. I don't think this need is special for this specific workplace, rather it is the expression of the broader human need of being able to express one's feelings and anxieties without being belittled. I think that is really important for them [the nurses]. (Participant 3, Region Y)

The care unit managers explained that the nurses needed support to solve urgent problems for which answers or solutions were not always available. These problems sometimes arose as dilemmas and therefore required discussion and reflection to be resolved in a thoughtful and supportive way. The cancellation of physical workplace meetings, due to the risk of infection among staff, affected the ability to discuss and solve such problems in the work group. To compensate for this, the care unit managers tried to be present at the unit as much as possible and communicate with the staff. They also described how they provided hands-on support to nurses who felt insecure in their basic competence or specifically in relation to their new responsibilities. This support could entail guiding the work or taking over specific tasks.

The care unit managers also described how they tried to 'protect' their staff and ensure acceptable working conditions, where uncertainty would be high for a long time. They did this through such means as scheduling staff summer vacations despite the uncertainty surrounding the evolution of the pandemic that determined the possibility for vacations.

3.2.3 | Work resources related to work tasks or organization

The care unit managers described a health care organization that focused fully on direct patient care and prevention of the spread of the COVID-19. They were relieved of many heavy administrative tasks and numerous development projects were paused, making the nurses who were previously engaged in these projects available to the care unit managers for direct patient care. The care unit managers experienced this concentrating on what they perceived as the core of health care, direct patient care, as highly meaningful.

The COVID-19 pandemic required the care unit managers to spend considerable time acquiring and disseminating information to their staff, but several of the informants stated that the access to updated information from the superior management had been very good. They also experienced extensive and good support from the chief physicians and infection control experts. They reported that although the COVID-19 pandemic disrupted previous routines and initially introduced much insecurity, the work relatively quickly found its new and functional forms.

While the COVID-19 pandemic stopped ongoing long-term organizational development, it also initiated organizational development. This required restructuring, which demanded time from the care unit managers for implementation and support to the nurses, but it also opened a window of opportunity for innovative thinking and development. For instance, the implementation of stringent procedures and routines for care hygiene had previously required effort and time from the care unit managers, but through the COVID-19 pandemic, these routines were fully and swiftly implemented, saving care unit managers' time and effort. The pandemic also gave rise to new solutions that were stated to be likely to continue after the pandemic. Examples of this included reallocation of work tasks between professional groups and the introduction of short and highly frequent digital workplace meetings. The pandemic also encouraged better coordination between care units, which resulted in more flexible cooperation between units. The managers felt this was likely to be maintained after the pandemic and to have long-term positive effects.

> It [the COVID-pandemic] has actually opened up for more flexibility and the idea that we [the care unit] are a part of the bigger organization [the hospital]. I think that has been a win. Or it will be a win in the long run. A larger organization with a common goal. This new understanding will increase the flexibility of, and cooperation within, the whole hospital. (Participant 2, Region Y)

3.2.4 | Work resources related to the staff

The care unit managers stated that the clear focus on patient care unified the staff around what was perceived as the core of health care work. They also described considerable social support between members of the work group through caring and looking out for each other and having informal debriefing talks.

The managers also stated that the deteriorations in the nurses' work situation regarding schedules, which involved imposing more shifts and suspended leave, called for considerable understanding and solidarity within the work group. The care unit managers appealed for such solidarity, and many testified that the staff had demonstrated a deep understanding of the situation, shown flexibility and voluntarily stepped up to take on a broad social responsibility. They also shared examples of how this had unified the work group during the COVID-19 outbreak.

> My manager came in to me, and said, 'Now you will get an impossible assignment'. 'Oh, shit', I thought, 'What is it?' 'You must staff the infection clinic with several nurses.' So, I wrote a mass text message to all my nurses: 'Now it's serious, who can help out and work this weekend?' I staffed 27 shifts in two hours, or they [the nurses] did! I was about to start crying, it was just amazing. It may not tell you much, but it's extremely good! It is usually very difficult to solve staffing shortages. (Participant 10, Region X)

4 | DISCUSSION

Previous research has indicated that care unit managers' presence and availability to the nurses at the care unit is an essential prerequisite for their ability to support their staff (Gadolin et al., 2021). In the present study, 59% of the care unit managers stated that the COVID-19 pandemic had caused them to spend more time present at the care unit to support their staff. A higher presence at the care unit was more common among care unit managers who themselves perceived high POS. This indicates the importance, for the health care organization's ability to manage future crises, of providing care unit managers with robust organizational support. Moreover, because previous research has convincingly shown that POS is associated with less stress and burnout and better work performance (Kurtessis

et al., 2017), managers' POS is an important resource to ensure high quality and efficiency of care, also under more normal conditions. The notion that POS is an important job resource for care unit managers to tackle the challenges ensuing the COVID-19 pandemic has also previously gained support (Gab Allah, 2021).

Our results also showed that care unit managers who experienced high organizational stressors or high role stressors spent less time being present and available to their staff during the pandemic. These results suggest that health care organizations should aim to reduce such stressors to make the health care organization better equipped to face and manage future crises.

The results of the qualitative interviews described in more detail how the COVID-19 pandemic influenced the managers' own job demands and resources for supporting the nurses. Other studies have highlighted similar experiences by care unit managers (e.g., Vázquez-Calatayud et al., 2022; White, 2021). The demands related to *restructuring and organizing work* emanated from the rapidly changing environment ensuing the COVID-19 pandemic. The care unit managers had to spend time reorganizing their own work and make swift decisions, despite uncertainty, which also influenced the organization of the nurses' work. Consequently, to provide the nurses with adequate support and handle staff anxiety, the care unit managers perceived that their demands related to *the staff* increased. These demands on the care unit managers are reflected in other research, focusing nurses' challenges and needs for managerial support during the COVID-19 pandemic (Moradi et al., 2021).

The care unit managers stated that although the COVID-19 pandemic initially ruptured present work structures and introduced a high degree of uncertainty, organizational structures and procedures found new functional forms fairly quickly. This was supported by resources related to *work task and organization* that were made available to the care unit managers during the pandemic, in terms of highly accessible and updated information from the superior management, and continuous support from chief physicians and infection specialists. The pandemic halted many ongoing, long-term development projects related to the health care administration and focused all activities in the organization on managing direct patient care. This released time for the care unit manager to be more directly involved in the patient care, which benefitted their sense of meaningfulness in their work. It also facilitated their ability to be available to the nurses, which is also closely related to the direct care. These results indicate that the ability to pursue professional fulfilment, and hence be able to perform tasks perceived as close to one's 'professional core' (Gadolin et al., 2020), is an important resource for care unit managers not least when the organization is under heavy stress. Similar results have been highlighted regarding the nursing staff, whose ability to focus on providing patient care during the COVID-19 pandemic allowed them to rediscover the values and meaning of being a nurse (Shin & Yoo, 2022).

The qualitative results also revealed important resources emanating from *the staff* for managing the pandemic that emerged during the crisis. The new, critical and acute situation initiated and encouraged innovative thinking and solidified good work group relations. The care unit managers testified about a high level of collegiality between the

nurses, who assumed a broad social responsibility for each other and for the work performed. This finding highlights the importance of creating arenas where collegiality can form and develop, to be well equipped to meet future crises. Similarly, Ke et al. (2021) identified a high willingness among nurses to work during the pandemic and found that professional commitment and patriotism were two important factors influencing this willingness.

4.1 | Limitations

There are certain limitations to the quantitative data. The results are based on cross-sectional analyses, which means that conclusions about causality must be drawn with caution. Reversed and/or reciprocal effects are also possible. Another limitation is the relatively small number of respondents in the quantitative study, which makes it difficult to estimate more complex models, including interaction effects. Nonetheless, when considering both quantitative and qualitative data, the results highlight that providing care unit managers with organizational support and decreasing their organizational stressors benefit their ability to support their staff in times of crisis.

All data were collected within a Swedish context. However, despite national idiosyncrasies, we argue that the findings of this paper are also relevant outside the context of the Swedish health care system due to the similar nature of the problems (cf. Morse, 1999) that the global spread of the COVID-19 virus caused in various national health care systems (e.g., Babore et al., 2020; Eriksson et al., 2021; Sheraton et al., 2020).

5 | CONCLUSION

The present study underscored the centrality of care unit managers' sound working conditions for their ability to act effectively as leaders during a crisis. The study indicated that care unit managers' POS was a resource for their ability to be available and supportive to the staff during the COVID-19 pandemic, while a high level of organizational stressors and role stress were counterproductive to this goal. High access to well-updated information and continuous knowledge support from chief physicians and specialists on infectious diseases were other important sources of support to lead during the pandemic. Another important resource for managing the COVID-19 crisis was a high level of collegial and social support among the nurses.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

A severe crisis, like the COVID-19 pandemic, not only implies immense challenges for health care organizations but also reveals resources that should be acknowledged and reinforced in order to better prepare for future crises. During a severe crisis, the care unit

managers need acute, active and ample support from their superior managers and medical experts in terms of continuously updated information and professional expert advice, to relieve pressure, uncertainty and unpredictability, and support swift, adjustable and innovative thinking and action. Superior management can also proactively make the organization better prepared to manage a severe crisis by sustained work to moderate organizational demands on the care unit managers and provide them with solid organizational support. The results also indicate the importance of a well-established shared professional ideology, focusing on patient needs and the caring mission, because this was highly motivational for care unit managers and nurses alike for taking on the extreme demands required to manage and ensure a high level of care during the crisis. Providing arenas in everyday work where health care professionals' collegiality can form and develop appears as essential for the social responsibility among the professionals that was manifest during the COVID-19 pandemic. Last but not least, the extraordinary efforts during the crisis from the care unit managers and the health care professionals should be acknowledged and the opportunity to recover, both mentally and physically, should be provided.

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ORIGINAL ARTICLE

WILEY

An investigation of the level of burnout and resilience among hospital based nurse managers after COVID 19 — A cross-sectional questionnaire-based study

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Abstract

Aim: We aim to investigate burnout and resilience among hospital based nurse managers post COVID-19 in order to suggest appropriate person-centred leadership support.

Background: Nurse leaders are central to establishing safe and caring environments for patients and staff. Therefore, their own wellbeing is crucial, particular in times of crisis where they must provide support and guidance.

Methods: Cross-sectional questionnaire included ward managers. Data collected were burnout inventory, brief resilience score and demographic data. To analyse data, we used descriptive statistics.

Results: 51.2% answered the questionnaire. Of those, 32.3% displayed symptoms of high personal burnout and 29% of work-related burnout. 6.5% showed signs of high employee-related burnout. As a group, ward managers showed moderate to high resilience.

Conclusion: Personal and work-related burnout was highly prevalent among ward managers. Results suggest that the cause of their burnout symptoms cannot be attributed to low individual resilience. We thus suggest a shift in focus from strengthening individual leadership resilience to the establishment of healthful and resilient cultures in accordance with person-centred leadership.

Implications for Nursing Management: Person-centred leadership has the potential to shift the focus from the resilience of individual leaders to that of collective responsibility for creating a healthful and resilient culture.

1 | INTRODUCTION AND RATIONALE FOR THE STUDY

Around the world, health care systems are faced with enormous staff shortage challenges, particularly a shortage of nurses (World Health Organization, 2020). This challenge precedes the outbreak of the COVID-19 pandemic in 2020; however, the strain placed on health care staff by the pandemic has exacerbated the problem (Valdez, 2022), as staff are faced with further cause for exhaustion and burnout (Sheather & Slattery, 2021). Burnout is defined as ongoing and unmitigated stress that results in symptoms of emotional exhaustion, depersonalization and a decreased sense of personal accomplishment (World Health Organization, 2019). Among health care professionals, burnout is associated with negative patient outcomes and reduced quality of care (Aiken et al., 2002; McHugh et al., 2011; Melnyk et al., 2018).

In many countries, the increased prevalence of burnout in the wake of the COVID-19 pandemic has led to a surge of programmes and interventions intended to promote the resilience among health care professionals (e.g., Giordano et al., 2022; Kelly et al., 2021). Resilience, the ability to bounce back from adverse or unpleasant experiences, has been suggested as a personality trait that may act as protective mechanism against burnout (Jamebozorgi et al., 2022). In relation to nursing, Rees et al. (2015) proposed a theoretically and empirically derived International Collaboration on Workforce Resilience - 1 (ICWR-1) model of individual psychological resilience based on large-scale, multi-site surveys of the nursing workforce. This model includes several key constructs that are predicted to have significant relationships with psychological adjustment via the mediating influence of resilience. The trait negative affect is known to be a relatively stable temperamental factor associated with various negative psychological outcomes such as depression, anxiety, stress, burnout and compassion fatigue (Craigie et al., 2016; Drury et al., 2014; Lu et al., 2014; Sarubin et al., 2015). As such, it might be a tempting solution to an increasingly burnt out health care work force to offer 'resilience training' to nurses and other health care staff and managers to enable them to cope better with a challenging work environment (Kelly et al., 2021; Udod et al., 2021). However, critical voices are highly apprehensive of the term 'resilience' and believe that it is being used to individualize the responsibility for political and systemic failures (Dall'Ora, 2021; Traynor, 2018). If the work environment is fundamentally lacking in adequate resources, communication, collaboration, shared decision-making, support systems and recognition, it is difficult to have resilient employees (Raso, 2020), and these organizational factors cannot be addressed through resilience training targeted at individuals, but rather, they require a systemic approach.

In the current climate, nursing managers are, perhaps more than ever, expected to be able to establish a person-centred, safe and caring environment for both patients and staff (Trepanier et al., 2022). The task is a challenging one at the best of times: Every day ward managers face the responsibility of overseeing staff, ensuring a high unit level quality of care and acting as intermediaries who communicate with both staff and senior management (Membrive-Jiménez et al., 2020). As managers, they play an essential role in promoting a positive work climate that may serve as a protective factor for burnout among their employees (Kester & Wei, 2018). The criticality of this function has even more evident during the COVID 19 pandemic, in which frontline workers reported a 'pendulum swing' between a meaningful experience and one of mental overload, which required supportive, appreciative and person-centred leadership to prevent feelings of overload from developing into burnout (Rosted et al., 2021). By person-centred leadership we understand a complex, dynamic, relational and contextualized practice that aims to enable associates and leaders to achieve self-actualisation, empowerment and well-being (Cardiff et al., 2018).

Therefore, the nurse managers' own occupational wellbeing and psychological safety are crucial, particularly in time of crisis when they are expected to provide support and guidance under extraordinary circumstances (Brown & McCormack, 2011). A systematic review finds a high prevalence of burnout among nurse managers even prior to the breakout of the COVID-19 pandemic (Membrive-Jiménez et al., 2020). The review suggests that work overload, the need to mediate personnel conflicts, lack of time and lack of support from superior staff all contribute to the development of burnout among nursing managers. These are challenges that have been present—if not exacerbated—during the COVID-19 pandemic, where frontline ward managers furthermore reported lack of recognition for their work, experiencing that their values were challenged and that they sometimes lacked confidence in their own abilities (Hølge-Hazelton, Kjerholt, et al., 2021b).

These factors, combined with the experience of not being able to authentically facilitate the leadership one desires, may lead to lack of engagement, which in a time of crisis may have serious consequences for patient safety, staff wellbeing and turnover and for the wellbeing and mental health of the nurse managers themselves (Hølge-Hazelton, Kjerholt, et al., 2021b). Further knowledge of occupational wellbeing among nurse managers is key to providing appropriate and adequate managerial support to prevent burnout, improve the work environment for all staff and improve quality of care.

At the time of data collection, Danish hospitals were seeing a new increase in numbers of patients hospitalized with COVID-19 due to the Omicron variant. With widespread community transmission, significant numbers of hospital acquired cases (Statens Serum Institut, 2021a) and a forecast indicating that numbers would rise

even further over Christmas (Statens Serum Institut, 2021b), managers were faced with enormous difficulties due to overcrowding and challenging shift planning.

1.1 | Aim

The overall purpose of the study was to investigate the level of burnout and resilience among hospital based nurse managers post Covid-19 in order to suggest appropriate person-centred leadership support. The research questions were as follows:

- How common is burnout among ward managers in Zealand University Hospital in the wake of the COVID-19 pandemic, and which types of burnout (if any) are particularly prevalent?
- What characterizes ward managers who develop burnout in terms of age, experience, span of management and resilience?

1.2 | Setting

Zealand University Hospital is the main hospital of the Zealand Region in Denmark. As Denmark's newest University Hospital, Zealand University Hospital is the centre of both specialized and educational treatments. The hospital has approximately 750 beds and approximately 2000 employees across two different locations as well as a number of satellite functions in the Zealand Region. The hospital offers both inpatient and outpatient services across a range of medical specialties. In the hospitals' vision and strategy for nursing and allied health, it is underlined that treatment and care should be person-centred (McCormack & McCance, 2006) and adjusted to the specific context (Zealand University Hospital, 2020).

The nursing hierarchy in Zealand University Hospital is similar to that of other Danish hospitals. The executive management level consists of the CEO and three hospital directors, including one director of nursing. The next management level consists of the heads of the 24 individual departments. The departments consists of one or several units, each led by a ward manager. Currently, the number of ward managers in the hospital is 59. Figure 1 gives a simplified picture of the nursing leadership structure.

2 | METHODS

2.1 | Design

This cross-sectional study draws on data from a larger study titled 'Frontline'. Frontline is a study investigating the experiences of health care professionals, managers and hospital employed
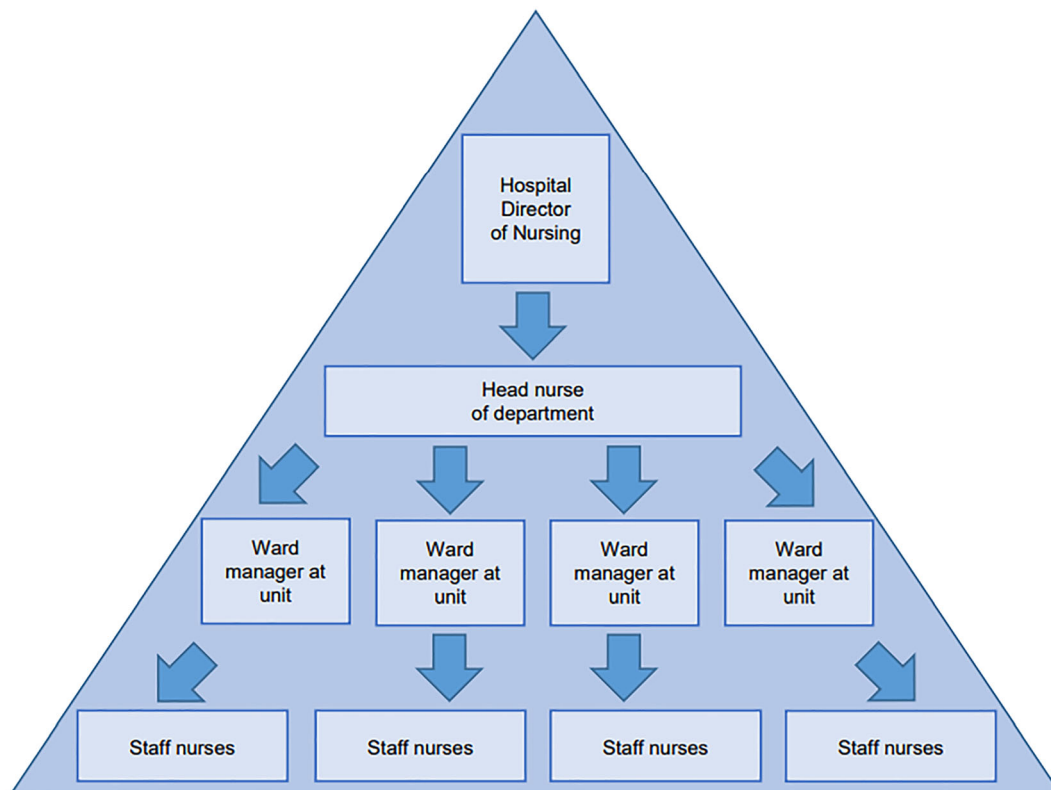

FIGURE 1 A simplified illustration of the registered nursing hierarchy in Zealand University Hospital. *Source*: from Hølge-Hazelton, Kjerholt, et al. (2021b)

researchers during the COVID-19 pandemic in order to generate recommendations on how to improve communication, cooperation and management in a future health care crisis (Berthelsen et al., 2021; Hølge-Hazelton, Kjerholt, et al., 2021a; Hølge-Hazelton, Kjerholt, et al., 2021b; Hølge-Hazelton, Rosted, et al., 2021; Hølge-Hazelton, Zacho Borre, et al., 2021). This study is a sub-study of Frontline that looked specifically at ward managers' burnout symptoms, resilience and experiences with the supportive measures the hospital management launched in the wake of the second national lockdown (winter 2020–2021) at three time points during 2021. Only the last round of data collection is used in this study, collected in November–December 2021.

2.2 | Ethical approval and informed consent

Permission to conduct the study was received from the hospital management, and the Danish Data Protection Agency (REG-026-2020) and The National Committee on Health Research Ethics approved the study (J.nr. 20-000013). This study was conducted in accordance with the principles of the Declaration of Helsinki (*WMA Declaration of Helsinki—Ethical Principles for Medical Research Involving Human Subjects*, *2020*).

2.3 | Data collection and participants

Contact information and human resource (HR) data were obtained through the head office of the hospital on all ward managers employed on 11 January 2021. An online survey was distributed to all ward managers ($n = 59$) via their work email using SurveyXact (SurveyXact by Ramboll, 2018), a web-based tool for creating and distributing questionnaire-based surveys. The email included a participation information sheet including information about the study and the right not to participate. Consent was provided in the first question of the questionnaire being 'do you still wish to participate in the survey' Yes/No. The survey was open between 25th of November and 10th of December 2021.

The questionnaire comprised two sections: a section on background information and a section consisting of validated surveys on burnout and resilience; see Section 2.4 for further details.

2.4 | Measurements

The following instruments were used for data collection, all freely available:

Copenhagen Burnout Inventory (CBI) consists of a 19-item survey assessing three sub-dimensions of burnout: personal, work-related, and client-related burnout (Kristensen et al., 2005). Personal burnout (six questions) refers to the degree of prolonged psychological and physical exhaustion, work-related burnout (seven questions) refers to the degree of prolonged psychological and physical exhaustion

directly related to the work a person does and client-related burnout (six questions) refers to prolonged psychological and physical exhaustion related to the work with clients. The term 'client' is used as a broad term to cover patients, inmates, students, etc. as appropriate for the specific group of respondents. For the purpose of this study, the word 'client' was replaced with the word 'employee' throughout the questionnaire.

Each sub-question is assessed on a Likert-scale with five levels ranging 0–100 in increments of 25. The total scale score consists of the average score of the items in each subscale. In line with the approaches of Madsen et al. (2015) and Jørgensen et al. (2021), the scores within each subscale were divided into low burnout (<50) or high burnout (≥50).

Brief Resilience Scale (BRS) was created to assess the individual's ability to bounce back or recover from stress (Smith et al., 2008). It is a six item survey consisting of both positively and negatively worded questions, and respondents answer using a 5-point Likert-scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree* and 5 = *strongly agree*). The BRS is scored by reverse coding the negatively worded items and finding the average of the six items. A score of 1.00–2.99 corresponds to low resilience, 3.00–4.30 to normal resilience and 4.31–5.00 to high resilience.

2.5 | Analysis

We used descriptive statistics to summarize and organize characteristics of the data with regards to frequency, central tendencies and variability. All descriptive analyses were conducted in IBM® SPSS® version 21.

Demographic data (age, gender, years of experience and number of employees) and BRS and CBI scores were summarized using mean values and either range (min–max) or standard deviation as appropriate.

Groups who scored high or low on burnout were compared in relation to demographic characteristics to see if groups differed on any characteristic. As the study is descriptive in nature, and due to the limited sample size, no hypothesis tests were carried out.

3 | RESULTS

Of the 59 ward managers, who received the questionnaire, 31 responded, giving a response rate of 52.5%.

Table 1 shows the demographic data for the 31 ward managers (52.5%) who completed the survey.

The ward managers who responded to the survey are predominantly female with a wide span in terms of age and numbers of employees. Just over half of the ward managers have some formal education in management, and most have more than 5 years of experience as managers.

Table 2 shows average CBI scores for personal, work-related and employee-related burnout and BRS scores, as well as the proportion

TABLE 1 Demographic data for ward managers (*n* = 31) who completed the survey

	n (%)	Mean (min–max)
Gender		
Male	1 (3)	
Female	30 (97)	
Age (years)		47.6 (30.6–66.6)
Formal education in management		
Yes	17 (55)	
No	14 (45)	
Years of experience as a manager		
0–2 years	9 (29)	
3–5 years	6 (19)	
>5 years	16 (52)	
Number of employees		30.7 (5–59)

TABLE 2 Ward managers' scores on Copenhagen Burnout Inventory (CBI) in the subcategories personal, work-related and employee-related burnout and Brief Resilience Scale (BRS) as well as proportion of ward managers with high burnout (CBI score ≥50) in each subcategory

	CBI/BRS score Mean (SD)	Number of employees with high burnout (score ≥50) *n* (%)
CBI personal	42.9 (18.6)	10 (32.3)
CBI work-related	39.1 (19.5)	9 (29)
CBI employee-related	25.7 (18.7)	2 (6.5)
BRS	4.02 (0.5)	Not applicable

of ward managers who displayed high burnout (CBI score ≥50) in each subcategory.

The highest average score (42.9) and the highest proportion of employees with a high burnout score (32.3%) are found in the subcategory personal burnout followed by work-related burnout and lowest on employee-related burnout. Only two ward managers (6.5%) had scores indicating high employee-related burnout.

Demographic data and BRS scores are presented in Table 3 for the group displaying low and high personal burnout. The groups do not differ in terms of years of experience and number of employees. Both groups had an average resilience score in the high range of normal (4.02). The group with high personal burnout was, on average, 6.6 years younger than the group with low personal burnout, and a slightly lower proportion of the group with high personal burnout had received formal education in management (50% compared with 57.1% of the group with low personal burnout).

4 | DISCUSSION

The findings of this study add to an established body of knowledge in nursing and health care focusing on how leaders cope in times of uncertainty and complexity. Whilst the sample size prohibits the generalization of these findings, the results do raise important issues that require reflection and consideration in relation to issues of burnout among leaders and factors that contribute to that.

The findings reveal that leaders experienced high levels of personal and work-related burnout but not employee-related burnout. Leadership development programmes are commonplace in health systems and in that context, there has been a particular focus on nursing leadership development, recognizing the significant role that nurses play in leading health care services. A dominant focus in these

TABLE 3 Characteristics of ward managers scoring high and low personal burnout on Copenhagen Burnout Inventory (CBI)

	Low personal burnout (score ≤49, *n* = 21)		High personal burnout (score ≥50, *n* = 10)	
	n (%)	Mean (SD)	*n* (%)	Mean (SD)
Gender				
Male	1 (4.8)		0 (0)	
Female	20 (95.2)		10 (100)	
Age (years)		49.7 (7.6)		43.1 (8.3)
Formal education in management				
Yes	12 (57.1)		5 (50)	
No	9 (42.9)		5 (50)	
Years of experience as a manager				
0–2 years	6 (28.6)		3 (30)	
3–5 years	4 (19.0)		2 (20)	
>5 years	11 (52.4)		5 (50)	
Number of employees		27.1 (18.2)		28.4 (10.3)
BRS		4.02 (0.6)		4.02 (0.4)

Abbreviation: BRS, Brief Resilience Scale.

programmes is that of 'leading others'/people management (Ullrich et al., 2021); however, our data suggests that this is *not* the area of practice that is most challenging to leaders. We do not know the relation between the 57.1% who attended a formal education in management and their experienced burnout. Examining this further could be relevant.

The issue of individual wellbeing has only recently been given attention in leadership development and in the support of health care staff more generally, especially since the pandemic. Recognizing that health care workers, including leaders, are influenced by a variety of societal factors that impact on their ability to do their job has not always been prioritized in health care systems. The COVID-19 pandemic challenged health care organizations to reconsider this, as personal and professional boundaries became blurred. The personal challenges that nursing leaders dealt with (in terms of the safety of themselves and their families) whilst also needing to provide an effective service in their role resulted in high levels of stress, mental ill-being and burnout (Hølge-Hazelton, Kjerholt, et al., 2021b). We would suggest that personal burnout is a symptom of larger organizational factors that fail to recognize the significance of ill-being on the leaders' abilities to do an effective job.

Kitwood (1993, 1997) described ill-being as being typically characterized by signs of agitation, anxiety, depression, despair, sadness, grief, tension and fear. Similar symptoms were described by nursing leaders in our research during the pandemic (Hølge-Hazelton, Kjerholt, et al., 2021b; Hølge-Hazelton, Rosted, et al., 2021; Hølge-Hazelton, Zacho Borre, et al., 2021). These characteristics of ill-being are not confined to individual experience nor to individual experiences during the COVID-19 pandemic, as they have been previously identified as common characteristics of psychologically unsafe work settings (Brown & McCormack, 2011). Brown and McCormack (2011) highlighted the lack of psychological safety as one of the key characteristics of care environments that lead to poor outcomes for patients and for staff. Psychologically safe environments are characterized by trust, team engagement and person-centred leadership (Brown & McCormack, 2011). McCormack and McCance (2006) argue that psychologically safe health care environments are characterized as 'healthful cultures'. Such cultures are energy enhancing and enable all persons to flourish as human beings because they foster explicit values of respect, compassion, kindness, engagement and mutual respect. If we are to help leaders balance personal wellbeing with work-related demands, then there is a need to extend the wellbeing focus in organizations beyond that of individual support to culture change work that creates psychologically safe wards, units and departments. Given that it was the younger leaders with fewer years of leadership practice that experienced greater levels of personal burnout, then the need for organizations to develop psychologically safe care settings seems critical.

Indeed, moving away from an individual focus on increasing individual resilience to prevent burnout will also demand a reconsideration of how the concept of resilience is used. This is also suggested by Udod et al. (2021) who describe individual resilience as a superficial

response to the retention of nurses post-Covid. The literature on the need for resilience in the health care workforce has tended to focus on individual resilience, that is, the ability of a person to recover quickly from stress and difficulties. Emphasis is placed on an individual's capacity for self-awareness of own coping mechanisms and how these impact on relationships with others (Robertson et al., 2016). Similar resilient leaders '… have the ability to sustain their energy level under pressure, to cope with disruptive changes and adapt. They bounce back from setbacks. They also overcome major difficulties without engaging in dysfunctional behavior or harming others' (Kohlrieser, 2014). Whilst Kohlrieser recognizes the importance of context, like many leadership commentators, the responsibility lies firmly with the individual leader to develop resilience and engage in practices that sustain it over time. However, given the work-related burnout experienced by leaders in our research, we would contend that health systems need to shift their gaze to that of 'community resilience' as suggested by Patel et al. (2017). In the context of a ward or department being characterized as a community, a resilient community is one that can withstand, adapt to, and recover from adversity (Patel et al., 2017). A resilient community is socially connected and has systems and processes in place that can withstand significant challenges and foster community recovery. Resilient communities promote both individual and community wellbeing and cohesiveness to strengthen their communities for everyday, as well as extreme, challenges (Patel et al., 2017).

The need for such community resilience has also been highlighted in other health professions. A recent study by Møller et al. (2022) found significantly high levels of burnout among Danish vascular surgeons. The authors concluded that 'The strong association with the psychosocial work environment, and the significant differences between departments, suggest that burnout is modifiable through changes in the work environment' (Møller et al., 2022, p. 1750). We would argue that health systems need to focus on implementing programmes that develop psychologically safe work environments and that this demand is more critical given the experience of the COVID-19 pandemic.

4.1 | Limitations

This study has limitations. Namely, the small sample size prevents hypothesis testing and does not allow for the generalization of the findings. Due to the single site nature of this cross-sectional study, it was impossible to reach sufficient statistical power, as the hospital employs a limited number of ward managers. Higher numbers would have allowed for a comparison between groups with high and low burnout with regards to age, experience, numbers of employees, formal management education and brief resilience score to investigate if any differences between groups were of statistical significance. Future studies are required to examine what characterizes nurse managers who do and do not develop high burnout in response to health care crises in order to better be able to provide person-centred leadership support in future.

The respondents were predominantly female with results including the response from only one male ward manager. However, out of 59 ward managers employed by Zealand University Hospital at the time of the study, only one was male. Accurate gender representation could therefore not be achieved.

5 | CONCLUSION

Our study suggests that personal and work-related burnout was highly prevalent among ward managers in late 2021. The groups who displayed high and low personal burnout did not differ in terms of resilience, suggesting that the cause of their burnout symptoms can not be attributed to low individual resilience. With this background in mind, we suggest the need for senior managers to influence and strengthen community resilience in their health care environments.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

In our research, although we did not find a significant relationship between years of experience as a nurse manager and degree of burnout, we did find some suggestion of a relationship between preparation for a management role and burnout. Person-centred leadership contends that leadership is a culture and not a role, based on the formation of effective relationships among all team members (Cardiff et al., 2018). Such a focus does not depend on years of experience as a formal leader for effectiveness in leadership behaviours and practices. Instead person-centred leadership focus on creating a culture of engagement where everyone considers themselves to be leaders in shaping the quality of the care environment. A shift in focus to this kind of leadership has the potential to shift the focus from the resilience of individual leaders to that of collective responsibility for creating a culture that is healthful and resilient.

CONFLICT OF INTEREST

The authors declare no conflicts of interest in this work.

ETHICAL APPROVAL AND INFORMED CONSENT

Permission to conduct the study was received from the hospital management and the Danish Data Protection Agency (REG-026-2020), and The National Committee on Health Research Ethics approved the study (J.nr. 20-000013). This study was conducted in accordance with the principles of the Declaration of Helsinki (*WMA Declaration of Helsinki—Ethical Principles for Medical Research Involving Human Subjects, 2020*). Informed consent was provided in the first question of the questionnaire.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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REVIEW ARTICLE

WILEY

Nursing leadership and management in home care: A qualitative scoping review

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Abstract

Aim: The purpose is to identify and synthesize the challenges of first-line nurse managers in home care concerning their managerial and leadership role, as described in current qualitative research literature.

Background: Increased responsibilities and shifting tasks in home care lead to challenges for first-line nurse managers. These challenges must be identified and evaluated to ensure quality care provision.

Evaluation: A scoping review mapped current qualitative research on first-line nurse managers in home care, focusing on their managerial and leadership role. A systematic search was conducted in CINAHL, Medline, EMBASE, and SweMed+. A thematic analysis was conducted on the four included studies.

Key issue(s): First-line nurse managers' role in home care involves multiple responsibilities. Four themes emerged: "professional responsibilities," "relational responsibilities," "economic and organizational responsibilities," and "juggling responsibilities—a demanding balance."

Conclusion(s): Findings provide new knowledge on how first-line nurse managers balance responsibilities in their role in the home care context—a complex context different from institutional settings like hospitals and long-term care. A focus on first-line nurse managers' support needs is necessary. Furthermore, an extensive research gap concerning first-line nurse managers' leadership and management role in home care indicates a need to increase knowledge from a range of perspectives.

Implications for Nursing Management: To develop sustainable and robust nursing leadership and management in home care, there is a need to (a) clarify first-line nurse managers' role and set boundaries around their responsibilities and (b) strengthen support from superiors, which will help empower first-line nurse managers in their daily work.

KEYWORDS
home care, nursing leadership, nursing management, nursing roles, scoping review

1 | INTRODUCTION

In welfare states, municipal health care organizations are characterized by a shift from institution to home care and a decentralization of responsibilities to first-line personnel (Vike, 2018). These changes entail major implications for the role of first-line nurse managers (FLNMs) in home care (Solbakken et al., 2020). This qualitative scoping review maps current knowledge on how FLNMs in home care experience their leadership and managerial role. The purpose is to identify challenges they may experience and areas for further research.

2 | BACKGROUND

Although there is extensive literature concerning theories and research in nursing leadership and management, there is no clear distinction between "leadership" and "management," nor definition of either term (Marquis & Huston, 2015; Stanley, 2017). A common approach to the concept of leadership is to distinguish between management and leadership (Kotter, 1990; Yukl & Gardner, 2020); however, recent literature has departed from this distinction and uses the term "leadership," which includes both (Blom & Alvesson, 2015; Crosby & Bryson, 2018). Leadership can be defined as achieving objectives through other persons (Yukl, 2013), and nursing research emphasizes (a) the importance of developing competent nurse managers as key for the success of health care organizations (González-García et al., 2021) and (b) improving nursing leadership as key for the future sustainability of the nursing workforce (Cummings et al., 2018).

In health care organizations, nursing leadership and management is performed at first-line, middle, and executive/senior levels (Engle et al., 2017; Scoble & Russell, 2003). FLNMs are generally described as responsible for first-level nursing services: They plan, organize, deliver, and evaluate nursing and interdisciplinary care for patients and manage their unit's human and material resources (Chase, 2010; Gunawan & Aungsuroch, 2017; Scoble & Russell, 2003). The FLNM's role is described as complex (Gunawan & Aungsuroch, 2017), as it now entails considerable and multiple responsibilities (Gunawan et al., 2018) and is performed in an environment characterized by instability with regard to patient demands and staffing (Duffield et al., 2015). To meet the vast variety of expectations in this multifactorial role, a wide range of competencies is needed (González-García et al., 2021; Gunawan et al., 2018). Unsurprisingly, then, research indicates an ongoing tension between clinical leadership responsibilities and management functions for nurses in leadership and management positions (Stanley, 2017)—this is also evident for FLNMs (Duffield et al., 2019; Galura, 2020). In home care, FLNMs are subjected to varied pressures, as they are expected to provide quality patient care, ensure patient safety, and be responsible for other health personnel and budgets (Holm & Severinsson, 2014; Solbakken et al., 2020). A study among FLNMs in nursing homes and home care describes how they experience being "stuck between a rock and a hard place," navigating their performance while feeling squeezed between superiors, subordinates, and peers (Nilsen et al., 2016). An increase in unpredictable, complex, and paradoxical elements like those described above can cloud the reference points leaders use in their decision making, thus challenging their exercise of discretion (Cronin & Genovese, 2012).

Nursing leadership and management is largely studied in institutional settings, such as hospitals and nursing homes. A comprehensive review from 2010 (updated in 2018) contains 129 articles focusing on the impact of different nursing leadership styles; it included hospital and other settings, but none specified the home care setting (Cummings et al., 2010, 2018). Another review by Solbakken et al. (2018), aiming to explore views on caring in nursing leadership/ management roles in any health care setting, ultimately included only studies from hospital settings. This indicates that the research base focusing on the challenges FLNMs in home care face in their leadership and management role needs to be further identified and synthesized.

One might assume that the challenges FLNMs face in institutional settings is likely to be similar in the home care setting. However, acknowledging that leadership is both situational and context dependent, recent research on leadership has shifted to a more system- and relationship-oriented focus. As Yukl and Gardner (2020) state, "The situational approach emphasizes the importance of contextual factors that influence leader behavior and how it influences outcomes such as subordinate satisfaction and performance. Major situational variables include characteristics of followers, the nature of the work performed by the leader's unit, the type of organization, and the nature of the external environment" (p. 33). Home care is a distinctively different setting than an institutional ward; it is characterized by limited face-to-face interaction between staff, as they practice in diverse settings and move from home to home, with shifting schedules. Other characteristics that make a difference are the staff's skill mix and the comprehensive responsibility they have when working alone, facing shifting and unpredictable patient demands. Research from the home care setting illuminates how nurses encounter increased pressure to work efficiently to meet the escalating number and complexity of home care patients (Holm & Severinsson, 2014). Quality of patient care and patient safety is a major concern, as studies indicate missed, unfinished, and negligent care when nurses must prioritize between patients and tasks (Suhonen et al., 2018). The tension between patients' needs and budget constraints is described as an ethical challenge (Tønnessen, 2011), as is meeting the expectations of informal caregivers (Tønnessen, 2011). The need to focus on the nursing role and leadership development in home care is evident—as is the need to map current knowledge, to further develop the competence of FLNMs and support them in the challenges they encounter as leaders in home care (Jarrín et al., 2019; Solbakken et al., 2020).

3 | REVIEW METHODS

3.1 | Aim and objectives

The aim of this qualitative scoping review was to map existing knowledge on how FLNMs in home care experience their management and

leadership role with an objective to identify and synthesize the challenges they encounter.

3.2 | Design

A qualitative scoping review method was selected to identify the nature and extent of the available research literature (Grant & Booth, 2009). A qualitative approach was deemed best—suited to investigate the challenges and dilemmas FLNMs experience in their role in home care.

To be included in this review, studies had to concern FLNMs' experiences as leaders in a home health care setting. The search date was set to 2005 to capture the ongoing shift from hospital to home care and the decentralization of responsibility to first-line workers in the municipal health care organizations (Vike, 2018). In this paper, we use the term "first-line nurse managers" to refer to all types of nurses in any managerial position.

3.3 | Search strategy

A systematic search strategy was developed by two search experts, with an emphasis on roles in combination with different terms for "manager" and "nursing in home care environments." No limits were set on language, document type, or study design in the search strategy, so as to not miss any relevant studies. Searches were limited to peer-reviewed papers only: We surmised that grey literature would yield a large number of studies on nurse management in general, but little on qualitative experiences with roles in home care, which was our focus. The searches were conducted in February 2021 in four databases: MEDLINE (Ovid), Embase (Ovid), CINAHL (EBSCO), and SweMed+. A search was initially performed in Business Source Elite, to better cover management literature, but as the only relevant hits were from a journal already indexed in CINAHL, the database was excluded in the final search. The search was updated in January 2022.

The search strategy was adapted to each database and their thesauruses. The full search strategy is presented in Appendix 1 and is available at 10.23642/usn.17040575 (Saltveit et al., 2021). The search strategy was peer reviewed by two librarians using the PRESS statement (McGowan et al., 2016). The reference lists of included studies were reviewed to further identify relevant studies, resulting in no new relevant studies. After a rigorous prescreening and duplication check, 149 references were screened.

3.4 | Study selection

In Figure 1, a detailed account of the steps are presented in a PRISMA flow chart (Page et al., 2021).

Two reviewers independently screened each of the 149 titles and abstracts from the systematic search against the inclusion criteria. Rayyan software was used in the screening process, and the publications were screened into three categories ("excluded," "included," and "maybe"). This was first done by the reviewers individually, and then together. The few discrepancies that arose were resolved by discussion. This first screening excluded 112 studies. Twenty-nine studies were categorized as "maybe," and eight studies were preliminarily included. The next step of the process was to examine the "maybe" and "included" studies in full text. This full-text reading was undertaken both individually and together by the reviewers. After this step of the review process, all 29 "maybe" studies and four of the preliminarily included studies were excluded.

In summary, of the 149 publications, 145 were excluded from the study (Table 1).

Nineteen articles were excluded as they employed a quantitative design. Furthermore, the quantitative studies focused on different themes not relevant for the focus of this study, such as routines for assessing nutrition status, attitudes toward dying patients, staff burnout, coordination between general practitioners and other professionals, and the effect of preceptorship in home care. Thirty-five were excluded as they were conducted in hospitals, nursing homes, or private health agencies, organizations, and medical centres. Five were excluded due to language. As 19 publications did not report empirical research, they were also excluded. Another 43 publications were excluded as the focus of the research was not on FLNMs' experiences of leadership or management. Although these studies had been conducted in a home health care setting and included FLNMs, their focus was on the administration of treatment and medication to a variety of patient groups. Furthermore, some related to working life research, the nurse–patient relationship, and the development of mentorship models for leaders. Another 25 studies were excluded as their focus was not explicitly on FLNMs (Table 2).

3.5 | Analytical reflections and work

Thematic analysis was conducted on the four included studies (Braun & Clarke, 2006, 2020; Brinkmann & Kvale, 2015; Levac et al., 2010), inspired by Braun and Clarke (2006). This approach is suitable for scoping reviews because it is flexible and unconstrained by a specific theoretical perspective (Braun & Clarke, 2006, 2020)—though Braun and Clarke (2020) emphasize that analysis is never conducted in a theoretical vacuum. As the four included studies are all based on a qualitative tradition, we leaned on theoretical assumptions related to qualitative perspectives in our analysis and reflections (Braun & Clarke, 2020; Creswell & Poth, 2018).

Braun and Clarke describe six analytical phases: (1) Familiarizing oneself with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report (Braun & Clarke, 2006). They emphasize that these should be approached with flexibility and do not have to be undertaken sequentially (Braun & Clarke, 2006, 2020). Consequently, and due to the limited amount of data in this study, phases 3, 4, and 5 were merged into one analytical step (which we term "step 3") in the analysis.

In step one of the analytical process, we conducted a repeated, thorough reading of the four included studies (Braun & Clarke, 2006).

FIGURE 1 PRISMA flow chart
(Page et al., 2021)
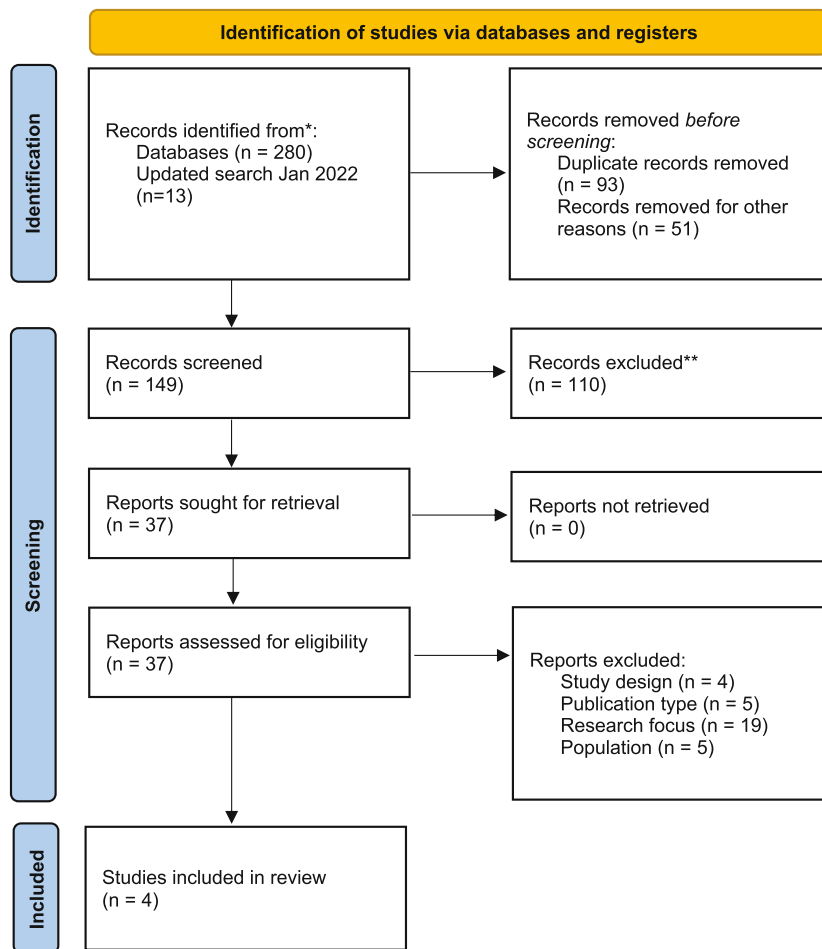
Step two involved implementing a coding strategy to highlight key points within and between each study (Braun & Clarke, 2006); this was an iterative question-driven process, where the researchers developed questions to explore the data from different angles (Kvale et al., 2009). Step three entailed organizing the coded data into thematic categories (phases 3, 4, and 5). The themes were developed from the codes, focusing on the overall similarities and characteristics of the FLNMs' experiences in their role as leaders, thus synthesizing the challenges they encounter.

4 | RESULTS

FLNMs practice within the home health care service, in a complex role characterized by a combination of professional, relational, economical, and organizational responsibilities. "Juggling" these responsibilities leads to challenges in the FLNM role.

4.1 | Professional responsibilities

The FLNMs emphasize that securing care provision for patients is among the most important responsibilities in their role as managers (Aaltvedt et al., 2017b; Cox, 2019; Gjevjon et al., 2013; Solbakken

et al., 2019). This relates to professional values and organizational norms and standards (e.g., quality, continuity of care, and patient safety). To fulfil this responsibility, the FLNMs stress the relational aspect of their manager role: Firsthand relationships with and knowledge about the patients are described as essential (Solbakken et al., 2019). They meet the patients in their own homes to ensure that patients' needs are met, get to know their relatives, and assess the patients' living conditions for themselves. They use this clinical presence to ensure quality of care and patient safety, as well as to evaluate staff members' clinical judgement and competence (Solbakken et al., 2019).

This relational focus is a way to safeguard patients; indeed, as Solbakken et al. (2019) state, the FLNMs act like a metaphorical shield to protect them. The FLNMs report having the overall responsibility for the patients' care—a responsibility that Aaltvedt et al. (2017b) relate to a care discourse rooted in a normative and value-based understanding of the FLNM role and position within the system.

4.2 | Relational responsibilities

The FLNMs also nurture and emphasize their relationships with staff members (Aaltvedt et al., 2017b; Gjevjon et al., 2013; Solbakken et al., 2019). This relates to the way the managers experience their own

TABLE 1 Reasons for exclusion

Reason of exclusion	Number	Examples
Study design	19	Validation of various research instruments quantitative designs (RCT, surveys, etc.)
Publication type	19	Editorials
		Interviews
		Historical comments
		Conference notes
Research setting	35	Hospitals
		Nursing homes
		Ambulant teams
		Private health agencies, organizations, and centres
Research focus	43	Administration of patient treatment and medication
		Technology implementation and evaluation
		Testing and validation of checklists and assessment tools
		Nurse–patient relationship
		Working life research
		Development of preceptor and mentorship models
		Administration of patient treatment and medication
Population	25	Patients
		Case managers
		Next of kin
		Clinical nurses
		Other professionals
Language	5	Spanish and Japanese

work situation, as well as their responsibility for the staff's well-being and job satisfaction (Aaltvedt et al., 2017b; Cox, 2019; Gjevjon et al., 2013; Solbakken et al., 2019). In Cox (2019), the managers describe their relationships with the staff as a crucial factor in their own job satisfaction; this includes communication with and feedback from staff members, as well as keeping current with the staff's clinical achievements and experiences. In Solbakken et al. (2019), the nurse managers describe themselves as facilitators of staff well-being and a good working environment; however, the FLNMs' overall responsibility for their patients underlies their relationship with and care for the staff (Aaltvedt et al., 2017b; Gjevjon et al., 2013; Solbakken et al., 2019).

4.3 | ORGANIZATIONAL AND ECONOMIC RESPONSIBILITIES

The FLNM's role includes organizational and economical responsibilities. The former relate to the administration of the unit within the legal and economic framework of the home health care system (Aaltvedt et al., 2017b; Solbakken et al., 2019). Although the FLNM's role includes many practical and technical tasks related to the day-to-day administration of their unit, the economical responsibility weighs particularly heavy on them (Aaltvedt et al., 2017b; Solbakken et al., 2019). FLNMs express a loyalty to the health care system, with a strong focus on adhering to the budget (Aaltvedt et al., 2017b; Solbakken et al., 2019). Aaltvedt et al. (2017b) point out that, when the organizational and economical responsibilities are at the forefront, the FLNMs prioritize these over their personal relationships with the patients and refer to the patients in general terms, as a group with certain rights; the authors report that FLNMs' care for their patients translates into a kind of legal management language, with a focus on the safe, sufficient provision of necessary health care. Moreover, limited resources result in tensions that necessitate support from their superiors, which often goes unmet (Cox, 2019; Solbakken et al., 2019).

4.4 | Juggling responsibilities—A demanding balance

As noted above, FLNMs are committed to the well-being and care of their patients and staff, but also to adhering to organizational standards and budgets (Aaltvedt et al., 2017b). Cox (2019) describes FLNMs as feeling overwhelmed by clerical work, and as wishing that they could pay more attention to the clinical aspect of their job. This simultaneous focus on the clinical and caring aspect versus loyalty to the budget makes the FLNM role demanding (Aaltvedt et al., 2017a; Cox, 2019; Solbakken et al., 2019). Cox (2019) found that the multiple responsibilities FLNMs were tasked with most affected their job satisfaction. Moreover, according to Solbakken et al. (2019), the challenge here relates not only to the number of responsibilities assigned to their role, but that they must "juggle" between them. As Gjevjon et al. (2013) state, the FLNM role thus entails complex decision making and navigating dilemmas. These latter arise between organizational ideals and norms, and staff and patient well-being.

Another prominent area of inner conflict and juggling of responsibilities concerns patient/staff care and responsibility for the budget, as the FHLMs work in a field characterized by two discourses: A care discourse and a budget/management discourse (Aaltvedt et al., 2017a). This constitutes a conflicting process that affects the FLNMs' role and their leadership in the home health care system. According to Gjevjon et al. (2013), this creates challenges for FLNMs, as they feel forced to prioritize between ideals and norms and daily tensions related to budget constraints, efficiency demands, and staff shortages. Solbakken et al. (2019) report that FLNMs express a cleverness in juggling between budget posts to keep the budget balanced. The authors state that the FLNMs experience this economic pressure as more burdensome than others, but conclude that they do not want to potentially jeopardize patient safety by prioritizing budgetary needs over patient care.

TABLE 2 Included articles

Author/year/title	Method	Aim of study	Conclusions
Cox, C. A. (2019). Nurse manager job satisfaction and retention: A home health care perspective	Semi-structured interviews	To gather a general understanding of nurse manager job satisfaction and retention	Administrative support is one of the strongest predictors of job satisfaction. Interpersonal relationships with nursing administrators had a greater effect on nurse manager engagement and proactive behaviour than interpersonal relationships with peers or physicians.
Gjevjon, E. R., Romøren, T. I., Kjøs, B. Ø., Hellesø, R. (2013). Continuity of care in home health-care practice: Two management paradoxes	Semi-structured interviews	To explore continuity of care from a manager's perspective: How do managers understand the concept of continuity of care and how do they assess continuity of care in home health-care? How do managers work to ensure continuity of care when managing care provision for patients in their homes?	The managers faced two paradoxes: (a) The continuity ideal vs. reducing the number of carers, and (b) the practicalities of home health care and caring for patients vs. caring for staff. The managers were forced to prioritize patients' well-being or the well-being of the staff. Ensuring continuity of care for all patients did not seem feasible.
Solbakken, R., Bondas, T., Kasén, A. (2019). Safeguarding the patient in municipal health care: A hermeneutic focus group study of Nordic nursing leadership	Semi-structured focus group interviews	This study illuminates the meaning and purpose of clinical presence in nursing leadership in municipal home care from the first-line nurse manager's own perspective. This study illuminates the meaning and purpose of clinical presence in nursing leadership in municipal home care from the first-line nurse manager's own perspective. Aim: This study illuminates the meaning and purpose of clinical presence in nursing leadership in municipal home care from the first-line nurse manager's own perspective. To explore the meaning and purpose of clinical presence in nursing leadership in municipal home care from the first-line nurse managers' own perspective	Clinical presence was perceived as a necessity to ensure that staff provided the best possible care. First-line nurse managers acted as a metaphorical shield to protect patient care, which was the main concern in their leadership.
Aaltvedt, V., Juvland, L, Öresland, S. (2017a). Omsorgsdiskurs og budsjettstyringsdiskurs: To konstituerende diskurser som konstruerer lederskap i hjemmetjenesten	Discourse analysis	To explore and interpret the discourses that appeared in the descriptions of the first-line managers' everyday work, and how these discourses shape first-line managers' leadership in home care services, inspired by ideas from new public management	The analysis revealed two discourses: a discourse of care and a discourse of cost efficiency. The first-line managers described a "good girl" and a "manager" role in these discourses.

5 | DISCUSSION

5.1 | Discussion of results and implications for further research

In this scoping review, we identified and synthesized existing qualitative studies on challenges FLNMs in home care experience in their management and leadership role. The results illuminate how FLNMs experience their role as complex, characterized by juggling professional, relational, economical, and organizational responsibilities. Thus, the results from this review both confirm existing research on FLNMs' leadership role in institutional settings (Duffield et al., 2019; Galura, 2020; Gunawan et al., 2018; Gunawan & Aungsuroch, 2017; Nilsen et al., 2016; Solbakken et al., 2018), and add to the general

body of nurse management literature by offering nuanced, context-specific knowledge related to the home care setting. As outlined earlier in this article, leadership must be explored with a situational and contextual focus, as contextual factors influence leaders' behaviour and followers' outcomes (Yukl & Gardner, 2020). In line with this focus, we discuss the results and their implications for further research related to contextual and situational aspects of home care.

First, FLNMs in home care are leaders in a service that takes place outside an institutional context, which makes planning, organizing, delivering, evaluating, and cooperation more difficult. The patients live in their own homes and the staff perform their work-related tasks on their own, in an increasingly complex and unpredictable context (Gerdin et al., 2021). The present study illuminates how the FLNMs emphasize clinical presence and firsthand knowledge about patients as essential to ensure provision of quality care. As we see it, increasing the clinical aspects of FLNMs' leadership role to address their professional and relational responsibilities is especially challenging in the home care context. FLNMs' ability to be clinically present or to offer collegial support whenever needed is limited due to geography, as care is provided in various locations. Thus, leadership in home care includes leading at a distance, which requires other measures and resources than in an institutional context. That staff are on their own in a home care setting and must execute clinical judgement also requires other qualities and competences (from both staff and FLNMs) than those required by an institutional context (Cronin & Genovese, 2012; Yukl & Gardner, 2020). It is therefore of utmost importance to further explore what these contextual and situational factors entail for the FLNMs' responsibilities in executing their leadership role. Furthermore, we must elucidate what kind of qualities and competences are needed in the FLNM role, as they are responsible for ensuring quality of care, patients' safety, and staff job satisfaction in home care.

Secondly, FLNMs are leaders in a sector currently reaping the consequences of recent decades' political decisions and organizational development, as well as an increasingly older population (United Nations, 2019). Generally speaking, patients are discharged earlier from hospitals and suffer from more complex conditions than before. Home health care is thus facing increased complexity in its patient group (Naess et al., 2017; United Nations, 2019). This is further complicated by a skill mix in home care—where the majority of the staff consist of undergraduates or assistants—together with a growing nursing shortage (Buchan et al., 2022). Research accordingly points to a competence gap (Bing- Jonsson et al., 2016), which makes it even more difficult for the FLNM to plan, deliver, and ensure quality services in home care. Given the above, it is worrying that we know so little about FLNMs' experiences of their role, considering how crucial that role is in today's health care system.

Finally, given our finding that FLNM's experience their role as complex, it is interesting to relate this to the intertwined understanding of the leadership and management role described in recent leadership literature (Blom & Alvesson, 2015; Crosby & Bryson, 2018) and nursing management and leadership literature (Marquis & Huston,

2015; Stanley, 2017). We argue that this lack of clarification may be an underlying factor as to why FLNMs experience their role as unbounded and overwhelming. The FLNMs in the present study describe how professional and relational norms seem to come into conflict with the more material aspects of the leadership role, as they must handle limited economic resources and staff shortages. This tension between clinical leadership responsibilities and management functions is also described in studies from institutional settings (Duffield et al., 2019; Galura, 2020). The FLNMs in this study experience a tension that appears rooted in ongoing deliberations and considerations, constituting a personalized inner conflict. As we see it, this inner conflict represents the heaviest burden on the FLNMs in the home care setting—one that they currently handle without support from their leaders or organization. Thus, further research needs to explore adequate organizational measures to ease this burden on the FLNMs.

To sum up, knowledge about FLNMs' context-specific experiences in home care is necessary to safeguard and secure quality of care for home-dwelling patients. Although it is well known that first-line professionals are taking on ever-more-complex responsibilities in the health care sector (Vike, 2018), FLNMs' experiences working in the home care context is largely unexplored. Our literature search delved as far back as 2005, and we ultimately included only four articles. In addition to this lack of qualitative studies, the FLNMs' role remains entirely uninvestigated in quantitative studies. This study thus confirms the impression that research concerning nursing leadership and management has largely focused on institutional settings, rather than home care.

5.2 | Implications for nursing management

This review provides an overview of and new insights into the inner conflicts faced by FLNMs in their daily work. Not only do they experience these conflicts as demanding, but they seemingly lack support around handling them. To develop sustainable and robust nursing leadership and management in home care, there is a need for increased emphasis on the challenges the FLNM experience in their role. We recommend that organizations clarify the FLNMs' role and set boundaries around their responsibilities, as well as strengthen support provided by superiors to empower the FLNMs in their daily work.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

ETHICAL APPROVAL

No ethical approval was required for this review manuscript.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in the University of South-Eastern Norway Research Data Repository at 10.23642/usn.17040575.v1.

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Nurse leadership in promoting and supporting civility in health care settings: A scoping review

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Abstract

Aim: This scoping review aimed to identify the existing evidence on how nurse leaders promote and maintain civility amongst nurses in health care settings.

Background: Research on managing workplace incivility in nursing, a prevalent and concerning issue worldwide, recommends nurse leaders to command cultural change through strong leadership and civility interventions. However, there is very little empirical evidence summarizing and analysing how nurse leaders pragmatically achieve civility, and combat workplace incivility, in the health care setting.

Evaluation: A scoping review was undertaken using the electronic databases CINAHL, Emerald Insight, MEDLINE, PsychINFO, PubMed and Scopus. Google Scholar was used to search for grey literature.

Key issues: The eight studies included in this review describe how nurse leaders promote and maintain civility under four key themes: (1) creating a shared vision, (2) educating self and others, (3) fostering accountability and (4) providing support.

Conclusion: The review provides an overview of commonly used strategies and actions that pragmatically promote and maintain civility in the health care setting by nurse leaders, while also highlighting areas of future research needed to strengthen the evidence base.

Implications for Nursing Management: It is important for nurse leaders to gain an understanding of evidence-based practices when addressing workplace incivility in order to address this prevailing problem for the future and safety of nurses moving forward.

KEYWORDS
civility, health care, nurse leaders, nursing, scoping review, workplace incivility

1 | BACKGROUND

Workplace incivility is internationally recognized as a prevalent and pressing issue in nursing, with clinical and workforce consequences clearly articulated across the literature over the past 20 years (Andersson & Pearson, 1999; El Ghaziri et al., 2021; Porath & Pearson, 2013). Strong links have been found between workplace incivility and burnout, resulting in poorer mental health amongst nurses and higher turnover intentions that exacerbate the global nursing shortage (Mikaelian & Stanley, 2016). In addition, workplace incivility can compromise patient safety and care delivery, eroding the success of organizations (Alquwez, 2020). Although professional nursing codes of conduct outline zero tolerance for bullying and harassment worldwide (Canadian Nurses Association, 2017; International Council of Nurses, 2021; Nursing and Midwifery Board of Australia, 2018), nurses continue to report higher levels of workplace incivility and bullying on a weekly basis than other health care professionals (Westbrook et al., 2021). Given the added pressures of the COVID-19 pandemic on health services and workforces, achieving civility solutions that ensure the health and well-being of both patient and provider is more imperative than ever.

A lack of clarity surrounds the definition of workplace incivility due to the synonymous use in the literature of similar but distinctly different terms like horizontal violence, lateral violence, bullying and unprofessional behaviour (Patel & Chrisman, 2020). Andersson and Pearson (1999), however, provided a foundational and widely accepted definition, namely, that workplace incivility comprises rude and unprofessional behaviours of low-intensity and ambiguous intent that violate the acceptable norms of respect within an organization. Gossiping, spreading rumours, eye-rolling and smirking threaten our intrinsic sense of self-worth, giving way to feelings of powerlessness, anger and humiliation (Clark, 2017). When left unaddressed, symptoms such as headache, interrupted sleep, intestinal issues, anxiety, depression and feelings of stress may arise, potentially developing into post-traumatic stress disorder or even precipitating suicidal intent (McPherson & Buxton, 2019). Unlike workplace aggression and bullying that involve clearly intended acts to harm others (Hills, 2018), workplace incivility may occur unintentionally through thoughtlessness or ignorance (Abolfazl Vagharseyyedin, 2015). According to Namie (2003), a 10-point continuum of organizational disruption places workplace incivility between a 1 and 3, whereas bullying covers mild to severe interreference with a score of 4 to 9. Regardless of seniority or position within an organization, workplace incivility can occur at any level of employment (Schilpzand et al., 2016). In the end, workplace incivility entails a lack of regard for the feelings of others (Andersson & Pearson, 1999), that not only affronts the dignity of that person (Clark, 2017) but also erodes professional standards of practice (Meier et al., 2021), and threatens the values upholding the integrity of organizations (Leiter, 2013).

Civility, on the other hand, is the act of respecting others, especially in situations where disagreement or disparity may arise (Clark et al., 2022). According to Clark et al. (2022), civility occurs by modelling kindness and empathy in an intentional manner that seeks to understand differences and upholds common ground across all social contexts (Clark et al., 2022).

Authentic, resonant, servant and transformational leadership styles have widely been proposed to enable change to promote civility (Mikaelian & Stanley, 2016). Authentic leaders carry a strong sense of self and actively practice core values (Giordano-Mulligan & Eckardt, 2019), whereas resonant leaders focus on building trusting relationships to ensure positive outcomes for their followers (Squires et al., 2010). Placing faith in their followers' abilities is a defining trait of servant leaders (Neubert et al., 2021), who focus on serving others. Conversely, transformational leaders foster growth in followers by fostering interpersonal relationships (Kaiser, 2017).

It has been widely recommended that nurse leaders address workplace incivility by commanding cultural change within organizations (Clark, 2019; Kavakli & Yildirim, 2022), namely, through strong leadership (Bagnasco et al., 2018; Crawford et al., 2019) and the delivery of civility interventions (Armstrong, 2018; Kile et al., 2019). However, little is understood regarding the manner in which nurse leaders set the tone for the culture, expectations and acceptable behaviours within their workplace (Kaiser, 2017; Porath & Pearson, 2013) or the effectiveness of civility interventions (Scott & Hills, 2021). According to Clark et al. (2011), increased workloads, poor relationships, poor work conditions, role ambiguity and a lack of knowledge in managing conflict contribute to the ability of nurse leaders to foster civility in the practice setting. These recommendations are often broad and problematic as they fail to provide evidence relating to the specific and effective strategies and actions that nurse leaders use to pragmatically achieve civility in practice. Currently, there is very limited empirical evidence uncovering how nurse leaders promote and maintain civility, and combat workplace incivility, in health care settings. Hence, given this challenging environment, there is a need to identify empirically tested strategies and actions to practically enhance the experiences of nurse leaders to intentionally foster civility for all nurses in the practice setting.

2 | REVIEW METHODS

2.1 | Aim

The aim of this scoping review is to identify the current evidence on the actions and strategies nurse leaders employ to promote and maintain civility in practice. Nurse leaders in this study are defined as any nurse working within a leadership or management role requiring the leading of nurses in teams.

2.2 | Design

A scoping review was undertaken due to the developing nature of this research area (Munn et al., 2018). A scoping review not only provides clarification for future areas of research but also maps the current evidence to form an overview of knowledge (Peters et al., 2020).

2.3 | Search methods

The authors utilized the Joanna Briggs Institute *Methodology for JBI Scoping Reviews* as a guide to inform this review (Peters et al., 2020).

The research question developed to guide this review is as follows:

What is the existing evidence on nurse leadership in promoting and supporting a culture of civility in health care settings?

The review utilized six databases including CINAHL, Emerald Insight, MEDLINE, PsychINFO, PubMed and Scopus. Google Scholar was employed to identify any grey literature. A librarian from Federation University Australia's Institute of Health and Wellbeing was consulted regarding the search terms and search strategy. Medical Subject Heading (MeSH) terms were also employed to enhance the search. The search terms included civil N5 behavio#r, OR civility, OR incivil*, OR uncivil*, OR rude*, AND nurs*, AND leader*, OR leading, OR manag*, OR supervis*, OR executive*, OR administrat*, AND clinical, OR hospital*, OR staff, OR personnel, OR provider*, OR worker*, OR professional*, NOT academi* AND faculty. The terms 'bully' and 'bullying' were omitted from the search as this form of workplace mistreatment is related to more intense acts of repetitive and systematic disrespect when compared with workplace incivility (Abolfazl Vagharseyyedin, 2015), although workplace incivility can be a precursor to bullying (Andersson & Pearson, 1999). Search terms were modified to meet the requirements of each database to ensure an accurate result.

2.4 | Study selection

A total of 1404 abstracts were sourced across the databases. The review included primary qualitative and quantitative peer-reviewed research reports, as well as grey literature. Review articles were excluded to avoid the repetition of knowledge. Reference lists were reviewed to identify additional reports. Abstracts were exported from the databases and Google Scholar into Endnote and subsequently uploaded to Covidence (Veritas Health Innovation, 2021) for appraisal by a team of three reviewers. Sources written in English and published between 2000 and 2021 were included in the search. Following the removal of 254 duplicates, titles and abstracts were then screened for relevance, resulting in 60 studies eligible for full-text review. Both nurse leaders and nurses who were able to report on the strategies and actions employed by nurse leaders with regard to civility and workplace incivility, including staff nurses and new graduate nurses, were included. As civility is a broad term, studies were included that specifically reported on levels of experienced workplace incivility or civility. Studies exploring similar topics, such as workplace culture or respect, were excluded if there was no empirical evidence of the association between the practices of nurse leaders with workplace incivility or civility. Studies were also excluded if the research was conducted outside of a health care setting, such as an academic environment. After discarding 49 studies that did not qualify for inclusion, eight studies remained (Figure 1).

Studies were assessed for quality using the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies (Moola et al., 2017) and the JBI Critical Appraisal Checklist for Qualitative Research (Lockwood et al., 2020). In order to apply the checklists, the researchers determined acceptable scores as a team. Cross-sectional studies were accepted with a score of 6 and above. The qualitative study was accepted with a score of 8 and above. Each researcher completed the checklists separately. No differences in scores were evident across the team.

2.5 | Data extraction and charting

Data were extracted and organized into tables under relevant headings including authors, year of publication and study origin, study type, study design and aim, sample, sample size, leadership style, method, findings and limitations (Table 1). Each research study was carefully reviewed using the six-step thematic approach described by Braun and Clarke (2021) to engage with the data and identify codes that were subsequently developed into key themes.

3 | RESULTS

3.1 | Study characteristics

Of the eight studies included in the final review, three originated from Canada and five originated from the United States. No reports were included from the search of grey literature. With the exception of one qualitative study (Clark et al., 2011), the remainder of the included studies employed a cross-sectional design. Sample populations constituted nurses from the same role, with one study including nurse leaders (Clark et al., 2011), two studies including new graduate nurses (Alkaabi & Wong, 2019; Laschinger & Read, 2016) and five studies including staff nurses (Kaiser, 2017; Laschinger et al., 2014; Lewis & Malecha, 2011; Neubert et al., 2021; Smith et al., 2018). Nurses reported working in medical-surgical units for the majority of the reviewed studies, followed by the operating room (Lewis & Malecha, 2011) and critical care unit (Smith et al., 2018). However, three of the reviewed studies did not collect or report on nurses' areas of employment (Clark et al., 2011; Kaiser, 2017; Neubert et al., 2021). Online surveys were used in three studies (Kaiser, 2017; Neubert et al., 2021; Smith et al., 2018), and one study gave participants the option of completing the survey online or by mail (Lewis & Malecha, 2011). Mailed surveys questionnaires were distributed in three studies (Alkaabi & Wong, 2019; Laschinger et al., 2014; Lewis & Malecha, 2011), with one study distributing a paper questionnaire containing four open-ended questions to nurses attending a conference (Clark et al., 2011).

Workplace incivility was most commonly measured using the Workplace Incivility Scale (Cortina et al., 2001). Both the Nursing Incivility Scale (Guidroz et al., 2010) and the Straightforward Incivility Scale (Leiter & Day, 2013) were used twice (Alkaabi & Wong, 2019;

FIGURE 1 Search flow diagram
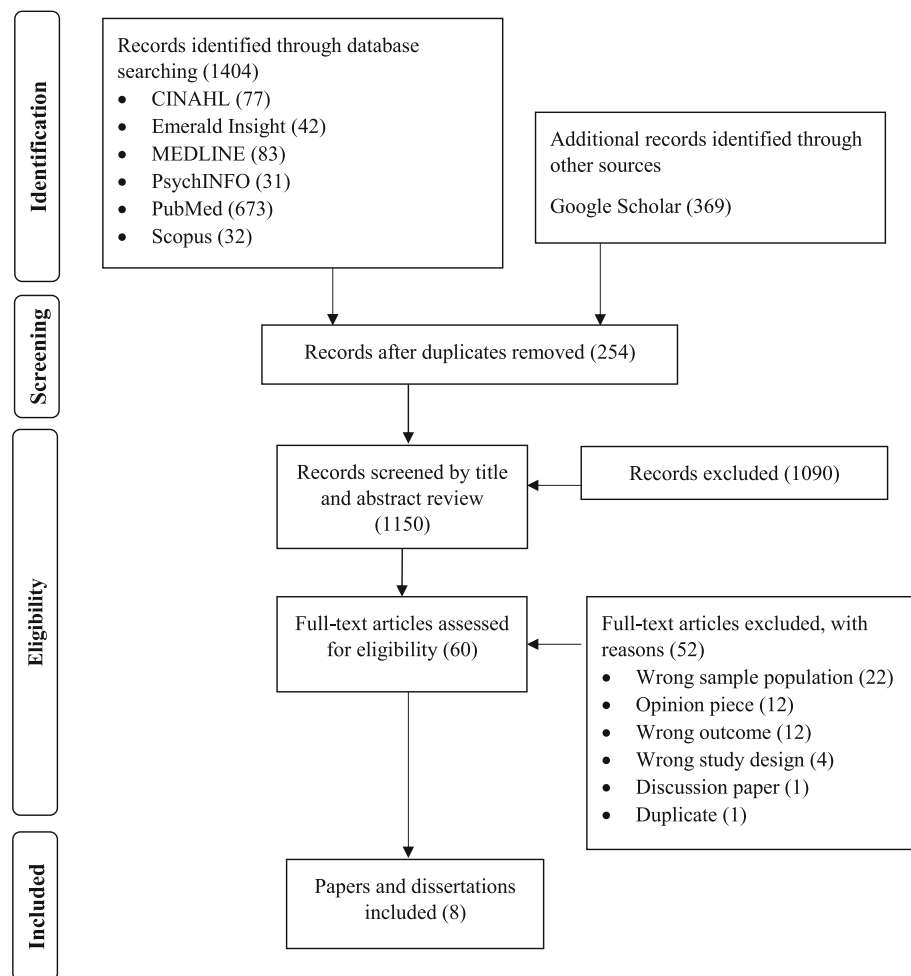
Kaiser, 2017; Laschinger & Read, 2016; Lewis & Malecha, 2011). Civility was measured in one study using the Civility Norms Questionnaire (Laschinger & Read, 2016; Walsh et al., 2012). Whereas the majority of participants from the included studies reported exclusively on workplace incivility experienced between co-workers, two studies investigated unit-level workplace incivility (Clark et al., 2011; Neubert et al., 2021), one included instigation from the manager (Alkaabi & Wong, 2019) and one included workplace incivility from the general environment, nurse supervisor and physician (Lewis & Malecha, 2011).

In terms of quality (Table 2), the majority of cross-sectional studies were awarded six out of eight items. These studies represented the poorest quality overall as they failed to consistently identify confounding factors (Kaiser, 2017; Laschinger et al., 2014; Laschinger & Read, 2016; Lewis & Malecha, 2011; Smith et al., 2018). The qualitative study (Clark et al., 2011) was awarded 8 out of 10 items (Table 3), given that the influence of the researchers on the participants, and vice versa, was not identified, and there was no statement to locate the researchers culturally or theoretically.

Given that the behaviours of nurse leaders were explored in this scoping review, leadership styles were also categorized. Whereas three studies did not report on a specific leadership style (Clark et al., 2011; Lewis & Malecha, 2011; Smith et al., 2018), authentic

leadership was examined in two of the included studies (Alkaabi & Wong, 2019; Laschinger & Read, 2016). Furthermore, resonant leadership was examined in one study (Laschinger et al., 2014), as was servant leadership (Neubert et al., 2021). Autocratic, democratic, laissez-faire, transactional and transformational leadership styles were also investigated in one study (Kaiser, 2017), with transformational leadership being the main focus of investigation in the study. Four key themes were identified: (1) creating a shared vision, (2) educating self and others, (3) fostering accountability and (4) supporting others. Table 4 highlights the key themes reported in this paper.

3.2 | Creating a shared vision

A common theme arising across three of the included studies related to creating a shared vision of a culture of civility. Kaiser (2017) found that including all members of staff, such as nurse managers and staff nurses, in creating a vision was an important aspect of fostering civility. In a qualitative study (Clark et al., 2011), nurse managers and nurse executives reported conducting joint meetings and establishing codes of conducts and policies as a strategy to cultivate civility in the practice setting. Nurse managers focused on fostering healthy practice environments with an emphasis on civility. Likewise, Laschinger

TABLE 1 Studies regarding how nurse leaders promote civility

Author(s), year and country	Type	Design and aim	Sample and speciality	Sample size	Leadership style
Alkaabi and Wong (2019) Canada	Master of Science dissertation	Cross-sectional To examine the relationship between new graduate nurses' experiences of manager incivility and their degree of trust in their managers.	New graduate nurses Medical-surgical unit	1020	Authentic
Clark et al. (2011) United States	Journal article	Qualitative To explore the perceptions of nurse leaders regarding civility in nursing education and practice, specifically in how to effectively address and foster civility amongst nurses.	Nurse leaders Speciality not reported	174	Not investigated
Kaiser (2017) United States	Journal article	Cross-sectional To examine the association between leadership style and nurse-to-nurse incivility, and to explore leader behaviours that impact staff relationships.	Staff nurses Speciality not reported	237	Authentic
Laschinger and Read (2016) Canada	Journal article	Cross-sectional To examine how person–job fit and authentic leadership impact civility norms and how these norms affect incivility amongst co-workers and resulting emotional exhaustion.	New graduate nurses Medical-surgical unit	993	Authentic
Laschinger et al. (2014) Canada	Journal article	Cross-sectional To examine a link between a positive leadership approach and workplace empowerment to workplace incivility, burnout and job satisfaction.	Staff nurses Medical-surgical unit	1241	Resonant
Lewis and Malecha (2011) United States	Journal article	Cross-sectional To examine the impact of workplace incivility on staff nurses in terms of productivity and cost.	Staff nurses Operating room	2160	Not mentioned
Neubert et al. (2021) United States	Journal article	Cross-sectional To investigate how nurse leaders prevent incivility by focusing on the needs of staff and encouraging a virtuous climate.	Staff nurses Speciality not reported	1485	Servant
Smith et al. (2018) United States	Journal article	Cross-sectional To determine whether workplace incivility between nurses is related to nurse work environment.	Staff nurses Critical care unit	233	Authentic

TABLE 1 (Continued)

Author(s), year and country	Direction of workplace incivility	Method	Findings	Limitations
Alkaabi and Wong (2019) Canada	From manager	Mailed survey consisting of the Authentic Leadership Questionnaire, Straightforward Incivility Scale and Trust in the Manager Scale. Descriptive statistics	Managers who practise authentic leadership are less likely to display workplace incivility, which hinders trust between the manager and new graduate nurses.	Self-report surveys increase response bias. Data collection is limited due to being part of a larger project. Inferences of causality are limited due to covariance between variables and theory.

TABLE 1 (Continued)

Author(s), year and country	Direction of workplace incivility	Method	Findings	Limitations
Clark et al. (2011) United States	Unit-level	Paper-based survey consisting of 4 open-ended questions distributed at a state-wide nursing conference. Thematic analysis	Behaviours that promote civility: 1. Conduct meetings with nurses to develop a shared vision of a culture of civility. 2. Establish codes of conducts and policies with clear expectations of behaviours. 3. Deliver ongoing education related to conflict resolution, problem solving and respectful communication. 4. Deliver ongoing education related to practice preparedness. 5. Practise positive role-modelling. 6. Focus on promoting a healthy practice environment. 7. Practice accountability for acceptable behaviours for both self and others. 8. Reinforce positive behaviours.	Small study conducted at a conference. Conceptual framework requires empirical testing.
Kaiser (2017) United States	From co-worker	Online survey consisting of the Vannsimpco Leadership Survey and Nursing Incivility Scale. Parametric, correlation and regression analysis	Behaviours that promote civility: 1. Foster teamwork between staff and managers. 2. Be highly involved in day-to-day issues in the workplace. 3. Empower staff by asking for input and making decisions based on this feedback. 4. Show genuine interest in the development of staff and their abilities. 5. Have close relationships with staff. 6. Recognize and reward good work amongst staff. 7. Involve staff in the vision of the organization. 8. Enforce policies and procedures in daily workflow.	Constructs of leadership and workplace incivility are subjective. Survey not tested rigorously for psychometric properties.
Laschinger and Read (2016) Canada	From co-worker	Mailed survey consisting of the Authentic Leadership Questionnaire, Areas of Worklife Scale, Civility Norms Questionnaire, Straightforward Workplace Incivility Scale, Co-worker Incivility Subscale, Maslach Burnout Inventory and Emotional Exhaustion Subscale. Structural equation modelling	Authentic leaders develop civility norms for new graduate nurses by addressing the 6 areas of person–job fit. The 6 areas of worklife include workload, control, reward, community, fairness and values.	Includes only Canadian new graduate nurses. Limited causality due to cross-sectional design.
Laschinger et al. (2014) Canada	From co-worker	Mailed survey consisting of the Resonant Leadership Scale, Global Empowerment Scale, Workplace Incivility Scale, Maslach Burnout Inventory-General Survey and Global Measure for Work Satisfaction. Structural equation modelling	Resonant leadership has a strong positive effect on workplace empowerment, which in turn has a significant negative effect on workplace incivility.	Limited causality due to cross-sectional design. Common method variance bias may be present.
Lewis and Malecha (2011) United States	From general environment, nurse supervisor and physician	Participants given option of completing mailed or online survey. Survey consisted of the Nursing Incivility Scale and Work Limitation Questionnaire. Content, construct and criterion validity	Nurses who perceive their managers' ability to effectively handle workplace incivility report lower levels of experienced workplace incivility.	Study conducted at one American organization.

TABLE 1 (Continued)

Author(s), year and country	Direction of workplace incivility	Method	Findings	Limitations
Neubert et al. (2021) United States	Unit-level	Online survey consisting of the Virtuous Behaviour Scale and Incivility Scale. Unit data were also used. Descriptive statistics and correlation	Servant leaders reduce workplace incivility by promoting virtuous practices and process that are accepted and copied by staff, which, in turn, promote a virtuous climate that signals the inappropriateness of workplace incivility.	Servant leadership may be influenced by a virtuous climate, not necessarily vice versa.
Smith et al. (2018) United States	From co-worker	Online survey consisting of the National Quality Forum-endorsed Practice Environment Scale of the Nursing Work Index and Workplace Incivility Scale. Descriptive univariate analysis, correlational and linear regression	Staff nurses report less workplace incivility when there is a positive perception of the ability, leadership and support offered by the nurse manager.	Limited causality due to cross-sectional design. Difficult to generalize findings as conducted at Magnet and Pathway to Excellence hospitals. Same-source bias. Survey fatigue may have caused a low response rate.

TABLE 2 Quality assessment of cross-sectional studies using the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies

Questions from checklist	Alkaabi and Wong (2019)	Kaiser (2017)	Laschinger and Read (2016)	Laschinger et al. (2014)	Lewis and Malecha (2011)	Neubert et al. (2021)	Smith et al. (2018)
1. Were the criteria for inclusion in the sample clearly defined?	+	+	+	+	+	+	+
1. Were the study subjects and the setting described in detail?	+	+	+	+	+	+	+
2. Was the exposure measured in a valid and reliable way?	+	+	+	+	+	+	+
3. Were objective, standard criteria used for measurement of the condition?	+	+	+	+	+	+	+
4. Were confounding factors identified?	+	−	−	−	−	+	−
5. Were strategies to deal with confounding factors stated?	−	−	−	−	−	+	−
6. Were the outcomes measured in a valid and reliable way?	+	+	+	+	+	+	+
7. Was appropriate statistical analysis used?	+	+	+	+	+	+	+
Outcome	7/8	6/8	6/8	6/8	6/8	8/8	6/8

Note: The plus symbol '+' indicates a 'yes' to the question. The minus symbol '−' indicates a 'no' to the question.

and Read (2016) identified a positive relationship between authentic leadership and person–job fit, as well as authentic leadership and civility norms amongst new graduate nurses. Person–job fit describes the six areas of worklife that employees should establish to achieve a stable working relationship with their organization (Leiter & Maslach, 1999). Although these six areas include workload, control, reward, community, fairness and values, it is likely nurse leaders develop a shared vision of civility primarily by addressing community and values. Community relates to the complex social context within an organization, such as social support from co-workers and

supervisors, whereas values describe the ideals, motivations and priorities influencing the relationship between staff and the organization that require alignment for full employee engagement (Leiter & Maslach, 1999).

3.3 | Educating self and others

In addition to a shared vision, educating self and others was a key theme arising from two of the reviewed studies. Lewis and Malecha (2011) found a negative association between workplace incivility

TABLE 3 Quality assessment of a qualitative study using the JBI Critical Appraisal Checklist for Qualitative Research

Questions from checklist	Clark et al. (2011)
1. Is there congruity between the stated philosophical perspective and the research methodology?	+
2. Is there congruity between the research methodology and the research question or objectives?	+
3. Is there congruity between the research methodology and the methods used to collect data?	+
4. Is there congruity between the research methodology and the representation and analysis of data?	+
5. Is there congruity between the research methodology and the interpretation of results?	+
6. Is there a statement locating the researcher culturally or theoretically?	−
7. Is the influence of the researcher on the research, and vice versa, addressed?	−
8. Are participants, and their voices, adequately represented?	+
9. Is the research ethical according to current criteria, or for recent studies, and is there evidence of ethical approval by an appropriate body?	+
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	+
Outcome	8/10

Note: The plus symbol '+' indicates a 'yes' to the question. The minus symbol '−' indicates a 'no' to the question.

scores and staff nurses' perceptions of the ability of the nurse manager to handle workplace incivility in the general environment. Essentially, staff nurses appreciated nurse leaders who demonstrate a strong ability to manage workplace incivility (Lewis & Malecha, 2011). These findings are consistent with those of Smith et al. (2018) who identified lower levels of reported workplace incivility by staff nurses when there was a positive assessment of the ability, leadership skill and support of their nurse manager. The nurse manager's competence as a leader positively influenced the nurse work environment, which, in turn, was associated with lower levels of workplace incivility (Smith et al., 2018).

In addition to improving their own abilities, two of the reviewed studies (Kaiser, 2017; Laschinger & Read, 2016) highlighted the importance of nurse leaders, showing a genuine interest in staff nurses' development. Helping staff nurses to develop their abilities is likely to involve ensuring reward and an aspect of control over one's work (Laschinger & Read, 2016). Control relates to the degree of autonomy a nurse holds in an organization, whereas reward consists of recognition and incentives that are often associated with professional efficacy and personal accomplishment (Leiter & Maslach, 1999).

Conflict management education, which involves teaching nurses how to resolve conflict, problem solve and have respectful conversations, was also identified as an important aspect of practice preparedness to promote and maintain civility (Clark et al., 2011).

3.4 | Fostering accountability

Three of the included studies addressed how nurse leaders foster accountability. Nurse leaders foster accountability by enforcing policies and procedures in the daily workflow and encouraging staff to do the same (Kaiser, 2017). Role-modelling and reinforcing positive behaviours are also important components (Clark et al., 2011). One reviewed study identified that nurse leaders who prioritize the needs of staff nurses reduce group-level workplace incivility by promoting virtuous climate (Neubert et al., 2021). When nurse leaders practised servant leadership, which is strongly related to serving others through role-modelling and positive interpersonal behaviours, there was a positive association with virtuous climate and a negative association with unit-level workplace incivility (Neubert et al., 2021).

3.5 | Providing support

Providing support was a prominent theme across three of the included studies. Support ranged from cultivating relationships with nurses to basing decisions on nurses' input and promoting teamwork. Transformational leadership was strongly associated with all aspects of support (Kaiser, 2017), followed by authentic and resonant leadership (Alkaabi & Wong, 2019; Laschinger et al., 2014). One study identified that close relationships with staff nurses, which is a keynote trait of transformational leadership, enabled nurse leaders to have a positive effect on workplace incivility (Kaiser, 2017). Alkaabi and Wong (2019) identified that workplace incivility by the manager was negatively associated with authentic leadership and, consequently, trust in the manager as perceived by new graduate nurses. The characteristics of authentic leadership, which is largely characterized by the leader possessing a strong moral code, mitigated uncivil behaviours and enhanced civility in the workplace (Alkaabi & Wong, 2019). This supports findings by Laschinger et al. (2014) who identified that resonant leadership, which values the emotional intelligence of the leader, directly influenced job satisfaction amongst staff nurses due to the indirect effects of empowerment, which facilitated lower levels of workplace incivility.

The provision of support was lastly reported by staff nurses as the recognition and reward of good work by nurse leaders in one study of this review (Kaiser, 2017). Reward and recognition were enabled through access to opportunities and resources (Laschinger et al., 2014). In the same study, nurse leaders provided further support by asking for input from staff nurses, basing decisions on this feedback and focusing on creating a strong sense of teamwork (Kaiser, 2017).

TABLE 4 Key themes

Themes	Specific aspects	Sources
Creating a shared vision	Develop a shared vision of a culture of civility	Clark et al. (2011); Kaiser (2017); Laschinger and Read (2016)
	Establish codes of conducts and policies together with staff to outline clear expectations of acceptable behaviours	Clark et al. (2011)
	Establish healthy practice environments with a focus on civility	Clark et al. (2011)
Educating self and others	Improve own skill and ability as a leader to understand how to appropriately address workplace incivility	Lewis and Malecha (2011); Smith et al. (2018)
	Promote the professional development and abilities of nurses	Kaiser (2017); Laschinger and Read (2016)
	Educate nurses about various conflict styles, conflict resolution and respectful conversations	Clark et al. (2011)
Fostering accountability	Hold oneself and others responsible for acceptable behaviours	Clark et al. (2011)
	Enforce policies and procedures regarding civility in daily workflow	Kaiser (2017)
	Role-model and reinforce positive behaviours	Clark et al. (2011); Neubert et al. (2021)
Providing support	Focus on building relationships with nurses	Kaiser (2017); Laschinger et al. (2014); Alkaabi and Wong (2019)
	Recognize and reward good work	Kaiser (2017); Laschinger et al. (2014)
	Ask for nurses' input and make decisions accordingly	Kaiser (2017)
	Promote teamwork between nurse and supervisor	Kaiser (2017)

4 | DISCUSSION

There is a general consensus, across the literature, that nurse leaders play a vital role in promoting and maintaining civility amongst nurses in health care organizations. Although this is widely acknowledged, the empirical evidence confirming how nurse leaders accomplish civility is limited. As a result, this scoping review was conducted to identify research regarding how nurse leaders pragmatically achieve civility in the health care setting. The findings suggest that nurse leaders not only manage rudeness when it occurs but also utilize a number of methods that ensure nurses are empowered through a healthy work environment. These predominantly were identified under the key themes of creating a shared vision, educating self and others, fostering accountability and providing support.

Nurse leaders described creating a shared vision and establishing codes of conducts and policies for acceptable behaviours across three of the studies of this review. Broadly speaking, a shared vision directs employees towards shared goals and codes of conducts and policies to establish behavioural norms of respect. These written and verbal contracts are widely regarded to influence organizational culture (Slåtten et al., 2021), with lower levels of workplace incivility associated with a caring culture (Phillips et al., 2018). Employees are more likely to reciprocate respectful behaviours when organizations uphold an environment that demonstrates concern and commitment to them (Memon et al., 2021). A shared vision, in particular, is perceived to be valuable to organizations (Slåtten et al., 2021). However, in order to understand how employees integrate a shared vision successfully, a recent study found that leaders in a hospital setting must be aware of

how both personal and environmental-related factors influence employees (Slåtten et al., 2021). Because employees may be morally disempowered when corporate codes of ethics are written by managers as a directive for employees (Babri et al., 2021), it is unclear how nurse leaders create a shared vision and develop codes of conducts and policies regarding behavioural norms of respect reflective of the wishes and concerns of all nurses.

Enforcing policies and procedures to maintain behavioural norms of respect in the daily workflow, holding oneself and others responsible for acceptable behaviours and role-modelling positive behaviours were actions found in this review to be reflective of accountability. Accountability is a globally acknowledged concept in nursing that incorporates legal, ethical and professional constructs (Chesterton et al., 2021). Nurses are liable to themselves and others regarding their actions and are also influenced by organizational and societal expectations and boundaries for practice regarding ethical conduct (Chesterton et al., 2021). Although applying these policies and procedures in the daily workflow to ensure nurses are accountable for uncivil behaviours is recommended (Crawford et al., 2019), no research could be sourced that provided empirical evidence on how accountability combats workplace incivility. It is important to acknowledge, however, that civility education, incorporating how to communicate in an assertive manner when conflict occurs, as well as role-play and cognitive rehearsal that enable nurses to actively practise scenarios of workplace incivility, can be effective (Armstrong, 2018). Practising simulated scenarios of workplace incivility may provide nurses with opportunities to rehearse accountability as it may occur in the clinical setting, but there is scant evidence on

how nurse leaders foster accountability to ensure civility in the health care setting.

This review identified that staff nurses' positive perceptions of their nurse leaders' ability to actively manage workplace civility, their leadership capability and the support offered to nursing staff, were associated with lower levels of workplace incivility. Although Laschinger et al. (2009) identified that new graduate nurses' perceptions of their nurse manager's ability were influenced by feelings of empowerment and support, there is little evidence in the literature exploring the manner in which nurse leaders improve their own abilities to manage workplace incivility. Structured leadership development programmes have been described in the literature, but with little focus on workplace incivility. Leadership is considered a 'common thread in generating change and changing culture in the battle against [workplace] incivility' (Mikaelian & Stanley, 2016, p. 965). In this review, authentic, servant and transformational leadership styles were associated with lower levels of workplace incivility (Alkaabi & Wong, 2019; Kaiser, 2017; Laschinger & Read, 2016; Neubert et al., 2021). Resonant leadership had an indirect effect on reducing workplace incivility via empowerment (Laschinger et al., 2014). Research supports that employees who work with ethical leaders are less likely to engage in workplace incivility (Taylor & Pattie, 2014). Furthermore, given that environmental factors exemplify the strongest relationship to the antecedents of workplace incivility over individual factors (Han et al., 2022), the absence of strong leadership likely contributes to persistent workplace incivility norms amongst nurses. However, the method in which these leadership styles are learned and enacted in the workplace, in addition to improving their skill in a general sense outside the realm of leadership, to improve the capabilities of the nurse leader has received little attention in the research literature.

The provision of opportunities for staff nurses to develop professionally was described by two of the studies in this review (Kaiser, 2017; Laschinger & Read, 2016). Empowerment has been widely acknowledged as a means to provide opportunities for nurses to advance in their careers. Achieving professional goals encourages a sense of self-determination and self-efficacy, which are important aspects of empowerment (Kaiser, 2017). Wing et al. (2015) found that structural empowerment not only negatively correlates with workplace incivility but also contributes to fewer mental health symptoms amongst new graduate nurses. Furthermore, an outcome of a civility intervention identified that nursing staff more readily accessed support and resources due to an increase in awareness regarding worklife issues (Spence Laschinger et al., 2012). However, few studies have identified this area as a means for nurse leaders to promote and maintain civility.

Various conflict styles, conflict resolution and respectful conversations found support in this review as being key components of civility education. The incorporation of education into civility interventions has been found to reduce the prevalence of workplace incivility in health care settings (Leiter et al., 2012). However, Walsh and Magley (2020) argue that, although evaluative studies provide evidence for change, it is unclear as to why these interventions are successful in achieving civility. Studies that are effectiveness oriented aim to uncover why an intervention is successful, which is important when determining how to effectively design and implement tailored civility interventions, as well as understanding the specific components that may impact employees' motivation to learn (Walsh & Magley, 2020). According to Park and Martinez (2022), the effects of risk factors on instigating workplace incivility are greater than the effects of preventative factors, indicating that a dominant focus on minimizing risk factors may aid in promoting civility. Hence, there is limited evidence regarding what specific aspects of tailored civility education are effective.

Finally, in this review of the literature, it was found that nurse leaders provided support to nursing staff by fostering trust, building relationships, and rewarding and recognizing good work. Although these aspects of support are widely recommended to promote civility and combat workplace incivility across the literature, the empirical evidence regarding their effectiveness is somewhat limited. First, trust in the manager has been found to enable nurses to speak more openly about their concerns, share suggestions to enable change and invest in one's work (Wong et al., 2010). In contrast, employees who report poorer trust in their managers are unlikely to recognize workplace incivility as violating norms, as their expectations of their managers were initially poor (Jawahar & Schreurs, 2018). Second, with regard to building relationships, one study in this review (Kaiser, 2017) reported higher levels of workplace incivility when the leader was unconcerned with interpersonal relationships with staff. Structural empowerment has been found to have a partial mediation effect on interpersonal relationships and work engagement (Cziraki & Laschinger, 2015), but the evidence remains limited. Third, reward and recognition are widely regarded as an acceptable method to improve employees' experiences of meaningful work, producing greater reports of well-being and a positive relationship between work performance and engagement (Salleh et al., 2020). However, Tetrick and Haimann (2014) suggest that, although rewards and recognition are generally received positively by employees, aspects of design and implementation of employee recognition programmes may cause negative consequences, especially when employees feel that they are the centre of attention of evaluation, or simply do not receive recognition. Ultimately, there remains a gap in the literature exploring the effectiveness of the described areas of support that enable nurse leaders to promote and maintain civility in the health care setting.

This scoping review is not without limitations. There were relatively few studies eligible for full-text review. Seven of the studies were cross-sectional, restricting any capacity to demonstrate causal relationships between variables. The quality of the remaining qualitative study was relatively weak as there was a potential for selection bias with nurse leaders being recruited at a conference. The conceptual framework of the qualitative study also required empirical testing, being newly adapted from a similar model developed for the academic setting (Clark et al., 2011). In addition, all studies were conducted in North America. Therefore, the strategies and actions of nurse leaders may largely reflect what is acceptable in Western culture, making the findings difficult to generalize to nurse leaders of different cultures.

5 | CONCLUSION

Workplace incivility requires immediate and targeted action by nurse leaders supported by clear evidence-based rationales. Creating a shared vision, educating self and others, fostering accountability and providing support were key themes identified in this review reflective of the current strategies and actions employed by nurse leaders to promote and maintain civility in the health care setting. However, our findings indicate a number of gaps in the evidence to support these strategies and actions. Further research is needed to understand how nurse leaders create a shared vision together with nurses, as well as in what manner nurse leaders practise accountability for themselves and for others when unacceptable behaviours occur. Research is also needed to inform how nurse leaders improve their own ability to foster civility in the workplace. Because empowerment is known to impact civility, research into the professional development needs of nurses as it relates to civility requires further attention. Lastly, there is a need to understand what specific aspects of tailored civility education are effective and how nurse leaders employ aspects of support to promote civility. Ultimately, without a strong evidence base to inform practice, workplace incivility will prevail unless nurse leaders equip themselves with the appropriate skills and knowledge to achieve civility for improved outcomes across nurses, patients and organizations.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

Understanding how to practically achieve civility is essential to performing the role of the nurse leader, regardless of how uncivil or civil a work environment is. A workplace characterized by civility provides a buffer for a range of professional nursing issues, including high turnover rates, burnout, job dissatisfaction and stress. Nurse leaders must be aware that workplace incivility is a serious breach of professional nursing codes of conducts and organizational policies related to acceptable behaviours. However, this awareness needs to be followed by knowledge of the necessary skills and strategies supported by evidence to promote and maintain civility. The findings from this scoping review provide nurse leaders with an overview of how civility is promoted in the health care setting, while also identifying areas of future research required to strengthen the evidence base.

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ORIGINAL ARTICLE

WILEY

Impact of empowering leadership on emotional exhaustion: A controlled interventional study in a large French university hospital complex

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Abstract

Aim: The aim of this study is to assess the effect of a systemic intervention on the evolution of empowering leadership and emotional exhaustion in a university hospital sub-centre compared to a control sub-centre, both being part of a large French university hospital complex.

Background: Empowering leadership is a promising strategy for developing hospital team engagement and performance. However, the bureaucratic functioning of large hospitals, characterized by a managerial culture of control and a stratified organization, can be a barrier to empowering leadership.

reviewed by an independent scientific committee. The French Ministry of Health had no role neither in the protocol definition, study conduct, data collection, data processing and interpretation nor in the choice of the results to be presented or the ways of valorization chosen.

Methods: The intervention included empowering leadership training, direct field experimentation of empowering leadership and coaching, involving all the sub-centre hierarchical levels for 12 months. Data were collected before and after the intervention. A total of 441 and 310 participants were, respectively, included in the intervention and control sub-centres.

Results: Empowering leadership was decreased, and emotional exhaustion was increased in the control sub-centre, while the scores remained stable in the intervention sub-centre. The increased emotional exhaustion in the control sub-centre could partially be explained by the change in empowering leadership.

Conclusion: In a context of decreased empowering leadership and increased emotional exhaustion, the intervention had a protective effect. Implications for the design of future interventions were discussed.

Implications for Nursing Management: This study unequivocally showed the benefit of transforming hospital management towards empowering leadership, to prevent increased emotional exhaustion.

Registration number: This study is registered on ClinicalTrials.gov on 4 July 2019 (NCT04010773).

KEYWORDS
controlled interventional study, emotional exhaustion, empowering leadership, hospital management, systemic intervention

1 | INTRODUCTION

There is currently a growing interest in empowering leadership, and more generally in management styles promoting employees' autonomy, both in the business world and in the hospital sector (Davids et al., 2019; Jønsson et al., 2021). In this sense, the scientific literature largely reports the positive effect of empowering leadership on the effectiveness of organizations (Cheong et al., 2019; Kim, Beehr, & Prewett, 2018; Lee et al., 2018). In other words, the more control employees have over their work and the more autonomy support they receive (i.e., empowering leadership; Amundsen & Martinsen, 2014), the more their level of identification and involvement is strengthened, to the benefit of performance (Amundsen & Martinsen, 2015; Kim, Moon, & Shin, 2018; Zhang & Bartol, 2010).

Nevertheless, recent reviews have reported a lack of controlled interventional studies assessing empowering leadership (Cheong et al., 2019; Lee et al., 2018) and more generally management (Nielsen & Taris, 2019). Indeed, the experimental change in empowering leadership level, associated with the monitoring of dependent variables compared to a control group, allows assuming with a greater level of confidence the existence and direction of the causal relationships between empowering leadership and its consequences (Cheong et al., 2019; Jønsson et al., 2021). In addition, an experimental study would allow validating the efficiency of interventions designed to transform management (Nielsen & Taris, 2019). Therefore, this type of research study could be useful in the design of interventions aimed at promoting empowering leadership in organizations (Cheong et al., 2019; Nielsen & Taris, 2019).

This issue is particularly relevant in the French hospital context. Considering the impact of management on occupational health, quality of care and economic performance, the French health authority urges hospitals to implement a more empowering management (Petit Dit Dariel, 2015). It should be noted that this proposal may be a challenge in the hospital context in France and more generally in industrialized countries. Like many large organizations, hospitals follow a bureaucratic model defined by a managerial culture of control and a stratified organization, which weakens professionals' control over their work and prevents their commitment and performance (Getz, 2009; Lega & de Pietro, 2005). In other words, the evolution towards empowerment implies a structural and cultural shift, which necessarily raises questions about the distribution of power and the representation that each person (e.g., top-level management, head of department, nursing manager, physician and caregiver) has of his/her role (Cougot et al., 2019; Davids et al., 2019; Spreitzer, 2008). Therefore, there is an interest in developing systemic interventions, targeting all the hierarchical levels of the organization, in order to increase empowering leadership. This type of intervention seems particularly relevant in the hospital context and more generally in the context of large bureaucratic organizations.

1.1 | Towards a new intervention to improve empowering leadership in hospitals

We identified two controlled interventional studies designed to increase empowering leadership in supervisors in professional settings

(Cheong et al., 2019). The first study of 12 months was conducted in nursing managers from different organizations in Canada (Dahinten et al., 2014; MacPhee et al., 2014). The second study of two and a half months was conducted in managers from different professional organizations in the United Arab Emirates (Martin et al., 2012). Both studies have shown an increase in empowering leadership post-intervention, based on managers' self-reported measurements for the first one and on the employees' responses for the second one. Although the professional contexts were different, both interventions showed the interest of combining (a) empowering leadership education, (b) empowering leadership training under real-life conditions and (c) individual coaching.

In this sense, the literature indicates that the closer the managerial training is to the real-life context, the more it limits the cognitive effort of assimilating and transferring what has been learned in training to the professional context, and thus, the more it promotes the effective adoption of managerial behaviours (Barnett & Ceci, 2002; Blume et al., 2010). In addition, several controlled interventional studies have shown the positive effect of individual coaching on the adoption of target managerial behaviours such as transformational leadership (Cerni et al., 2010; Grover & Furnham, 2016; MacKie, 2014), especially in case of theoretically grounded coaching, and coaches themselves are considered relevant in psychology (Grover & Furnham, 2016). Thus, while facilitating the direct field implementation of behaviours with the help of a coach, training in empowering leadership appears to be a relevant approach.

However, as explained earlier, the bureaucratic structure and culture of hospitals could limit the effectiveness of such a system (Cougot et al., 2019; Getz, 2009; Lega & De Pietro, 2005). In this sense, the literature on empowering leadership shows that the top- and middle-level managements of a company determine the adoption of empowering behaviours by front-line managers and, ultimately, the empowerment of field professionals (Carney & Getz, 2016; Dahinten et al., 2014; MacPhee et al., 2014; Migneault et al., 2009). In turn, several works have suggested that the manifestations of the employees' empowerment (e.g., autonomy) would encourage managers to adopt empowering leadership (Cheong et al., 2019; Sharma & Kirkman, 2015; Uhl-Bien et al., 2014). Thus, empowering leadership of top-level management and front-line managers and empowerment of front-line professionals are interrelated, potentially bidirectionally (Cheong et al., 2019).

The aim of this study was to assess the effect of a systemic intervention on the evolution of empowering leadership in a university hospital sub-centre (the 'intervention sub-centre') compared to a 'control sub-centre', both being part of a large French university hospital complex (*Centre Hospitalier Universitaire,* CHU). More precisely, an intervention combining (a) empowering leadership education, (b) direct field empowering leadership training and (c) coaching was implemented at all hierarchical levels of the same sub-centre, in order to take into account the bureaucratic configuration of the organization (see details in Section 2). To facilitate the direct experience of empowering leadership by managers, but also to directly empower teams, a collective quality-of-life support in the workplace, encouraging the employees' expression and action within the framework of

their work (i.e., empowerment), was implemented in each of the sub-centre care units.

> **Hypothesis H1.** The intervention will significantly increase the level of empowering leadership in the intervention sub-centre compared to the control sub-centre.

1.2 | Experimental study of the effect of empowering leadership on emotional exhaustion

Emotional exhaustion, namely, feelings of being overwhelmed and exhausted of one's resources (Maslach et al., 2001), is a major concern in the hospital sector. Indeed, emotional exhaustion is considered the central factor of burnout, as it is the progressive exhaustion of the individual's resources that is considered the precursor to the other two symptoms of burnout (i.e., cynicism and reduced personal accomplishment; Kristensen et al., 2005; Maslach et al., 2001; Taris et al., 2005). The prevalence of burnout is particularly high in hospital staff, including both nurses (global prevalence of 11.23%; Woo et al., 2020) and physicians (prevalence of 21% in France; Kansoun et al., 2019). Moreover, burnout triggers the occurrence of psychological disorders (e.g., depression) but also physical diseases such as type 2 diabetes and cardiovascular disorders (Salvagioni et al., 2017). These data show that emotional exhaustion (as the central factor of burnout, Kristensen et al., 2005; Maslach et al., 2001) is a particularly relevant indicator of the health status of hospital workers and a priority target for prevention (Kansoun et al., 2019; Pappa et al., 2020; Woo et al., 2020).

Although the positive effects of empowering leadership on performance are well established, its effects on emotional exhaustion have been poorly investigated, and the literature on this subject is contradictory (Kim, Beehr, & Prewett, 2018). On the one hand, some studies have shown that empowering leadership decreases emotional exhaustion (Bobbio et al., 2012; Greco et al., 2006), presumably by promoting the development of the resources available to employees to cope with job demands (e.g., social support and self-efficacy; Kim, Moon, & Shin, 2018; Kim & Beehr, 2018; Tripathi & Bharadwaja, 2020). But the intensity of these effects is low (Kim, Beehr, & Prewett, 2018). On the other hand, other studies have reported that empowering leadership may be a burden (Cheong et al., 2016; Sharma & Kirkman, 2015), which can consume resources and lead to emotional exhaustion. Specifically, empowering-leadership-induced autonomy could be a stressful cognitive demand, as the employees are not only performing requested tasks but are also involved in the decision making related to their work (Cheong et al., 2016). Further studies are thus needed to understand the effect of empowering leadership on employees' emotional exhaustion.

Based on the experimental design of this study, we investigated the effect of the intervention on the evolution of employees' emotional exhaustion in the intervention sub-centre compared to the control sub-centre. In addition, we investigated the mediating effect of the evolution of empowering leadership on the relationship between the intervention and the evolution of emotional exhaustion. Thus, the

aim of this study was to confirm that empowering leadership evolution was responsible for the evolution of emotional exhaustion in the intervention sub-centre compared to the control sub-centre.

Hypothesis H2. The intervention will significantly decrease the level of emotional exhaustion in the intervention sub-centre compared to the control sub-centre.

Hypothesis H3. The effect of the intervention on emotional exhaustion will be mediated by empowering leadership.

2 | METHODS

2.1 | Design and context

This randomized, controlled, interventional study was conducted in a French university hospital complex between 2018 and 2020. The duration of the psychosocial intervention was 12 months. It concomitantly targeted the entire teams, front-line managers and top- and middle-level managers of a sub-centre of the university hospital complex. Therefore, randomization was performed at the sub-centre level. The study indicators were collected before (T0) and directly after the intervention (T1).

2.2 | Description of the university hospital complex and sub-centre enrolment

The university hospital complex includes 12 sub-centres, with 5–6 departments each. These departments include several care units for a total of 20–25 care units per sub-centre. The number of employees in the sub-centres varies between 300 and over 1,000. Three hierarchical lines can be distinguished (Figure 1): the administrative line, the nursing line and the medical line, all three being under the authority of the general director of the university hospital complex. This three-axis hierarchy is divided into four main hierarchical levels: the university hospital complex management, the sub-centre management and the department and care unit management (respectively under the supervision of the chief medical officer and the nursing manager).
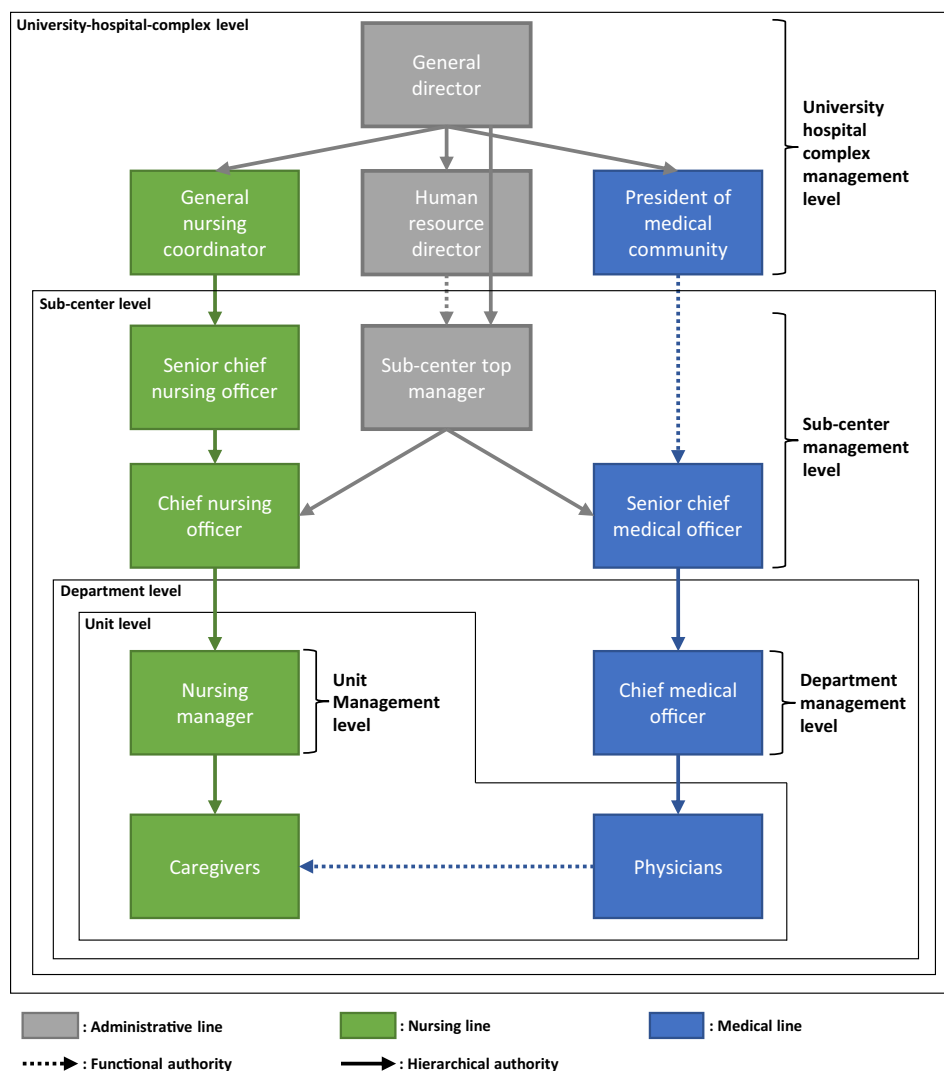

FIGURE 1 Hierarchical structure of the university hospital complex

The sub-centres were recruited prior to randomization in collaboration with the university hospital complex management if they met the following eligibility criteria:

1. Agreement of the university hospital complex management (i.e., general director, human resource director, president of medical community and general nursing coordinator).
2. No major reorganization or capacity restructuring planned over the study period.
3. Agreement of the sub-centre management (i.e., sub-centre top-level manager, senior chief nursing officer, senior chief medical officer and chief nursing officer).
4. Sub-centre with both medical and surgical activities.

A first random draw was planned among the eligible sub-centres to determine the two sub-centres to be included in the study. However, only two sub-centres met all the criteria. Therefore, both sub-centres were included without randomization.

2.3 | Data collection and randomization

The indicators were collected during the mandatory check-up in the occupational health department of the university hospital. Professionals were welcomed by a clinical research nurse who presented the research protocol and included eligible participants in the study who met the following criteria:

1. Any professional working in a care unit (e.g., nurse, care assistant and chief medical officer).
2. Signed written informed consent to participate in the research.

Participants completed a tablet questionnaire in the waiting room. After the inclusion campaign and baseline data collection, a random draw was performed by the multidisciplinary scientific committee of the study to determine which of the two sub-centres would benefit from the intervention. The scientific committee was composed of the researchers associated with the project (including the co-authors of this article). Seven of them belonged to the university hospital and six to other institutions. Data collection after 1 year of follow-up (T1) followed the same procedure. The duration of each data collection campaign was 3 months.

2.4 | Experimental procedure in the intervention sub-centre

The study process targeted the entire system and initially involved a transfer of power in the form of a quality-of-life consultation process for each care unit. All stakeholders, from the top-level management to the teams, were thus invited to directly experience an original space for dialogue and co-construction, implying empowerment for the teams and empowering leadership for the managers. The whole process was facilitated by the principal investigator, the study coordinator and a team of facilitators, according to a standardized protocol, with the help of the multidisciplinary scientific committee. The study coordinator and the facilitators were specially recruited for this project. Their sole supervisor was the study's principal investigator, who was himself affiliated with the occupational health department of the university hospital complex. The intervention had been developed both in an empirical and theoretical approach: empirically as we drew on transformation experiences reported in the ethnographic literature (Carney & Getz, 2016; Davids et al., 2019; Getz, 2009) and advice from two external chief executive officers (CEO) experienced in empowering leadership but, also, as we conducted a pilot study to pre-test (on two departments) and improve the intervention model. Theoretically, we designed the intervention based on empowering leadership theory (Amundsen & Martinsen, 2014; Konczak et al., 2000), as well as broader models of social psychology, in particular, commitment theory (Guéguen et al., 2013; Kiesler & Sakumura, 1966) and self-determination theory (Ryan & Deci, 2000).

Step 0: Preparation of the intervention (12 months): presentation and validation of the procedure with (1) the general director and other university hospital complex managers; (2) the senior management of the sub-centres meeting the inclusion criteria and (3) the trade unions: setting up of a steering committee composed of the directors of the university hospital complex management, including the principal investigator and invitation of the steering committee to visit a company recognized for its empowering leadership, including a meeting with its CEO. This step ended with T0 data collection and randomization. The aim is top-level management acculturation to empowering leadership.

Step 1: Start of the intervention: inclusion of the senior management of the intervention sub-centre in the steering committee and training seminar No. 1 (0.5 days). The seminar was intended for the unit, department and sub-centre managements and involved the university hospital complex management. It included (1) theoretical knowledge on empowering leadership and its consequences and (2) the intervention of the CEO of a company known for its empowering leadership who shared his personal experience of transformation towards empowering leadership and mediated a workshop debate. The aim is acculturation to empowering leadership and involvement of the entire hierarchical chain in the intervention.

Step 2: Qualitative diagnosis and unit engagement phase (4 months): the facilitators met with the nursing managers and chief medical officers. They presented the intervention to the teams. They then conducted exploratory research interviews with the professionals. Then, they wrote a qualitative report for each unit, describing the resources and constraints perceived by the team. The report should not contain any recommendations. The aim is alliance of facilitators with the unit and department management and pre-engagement of the teams.

Step 3: Phase of submission of the reports to the hierarchy in a coaching logic (1 month), starting with the steering committee, and then to the front-line managers. The aim is empowering leadership coaching and preparation for the accompaniment of the teams within the entire hierarchical chain.

Step 4: Training seminar No. 2 for managers (0.5 days): The principal investigator presented the team accompaniment and recommended managerial practices (i.e., empowering leadership). Then, a CEO of an external company known for its empowering leadership came to share his experience in transformation towards empowering leadership and then mediated a workshop on the implementation of the future accompaniment and empowering leadership. The aim is to mobilize the entire hierarchical chain towards empowering leadership in the implementation of step 5.

Step 5: Feedback, collective debate on the reports and presentation of the accompaniment plan in each care unit, totalling 20–25 feedback contributions for the intervention sub-centre (1 month): The medical and nursing team, the nursing manager, the chief medical officer, the sub-centre management and the human resource manager of the university hospital complex were present at each meeting. The facilitator detailed each part of the qualitative analysis for collective discussion. He mediated the debate between all the stakeholders and encouraged the emergence of potential solutions. The aim is empowering leadership for the managers and team empowerment.

Step 6: Phase of working groups in each unit (3 months): The composition and objectives of the groups were chosen by the medical and nursing team. The groups had to be led by a nursing referent and a medical referent. The nursing manager and the chief medical officer helped the referents and the groups, by sharing developments across the different groups and providing an overall synthesis according to a department perspective. The facilitator assisted the groups, while coaching the managers in empowering leadership. The aim is empowering leadership for the unit and department managers and team empowerment.

Step 7: Negotiation and co-construction meetings in each care unit (1 month), with the same stakeholders as in step 5. The topics discussed during the meetings were defined by the working groups and communicated to the steering committee in advance. During the meetings, the working groups presented the improvements they implemented and formulated their requests for support requiring a structural provision. The university hospital complex and sub-centre managerial staff valued commitment, participated in the collective reflection on improvement and arbitrated the scope of management available, while informing on the constraints to be taken into account at the overall facility level (e.g., economic constraints). The nursing manager was encouraged to mediate exchanges, with the coaching of the facilitator. The aim is empowering leadership for the unit, department and sub-centre management and team empowerment.

Step 8: Structural adjustment phase (2 months): Following the meetings, the managerial bodies implemented their decisions and proposals, while taking care to communicate with the teams. The facilitators prepared their departure by inviting the nursing managers and department heads to continue the working groups and maintain their referents. The aim is to initiate a continuous improvement loop, combining empowering leadership for the unit, department and sub-centre management and team empowerment.

2.5 | Procedure in the control sub-centre

No intervention was performed in the control sub-centre.

2.6 | Indicators

Empowering leadership was measured using the Leader Empowering Behavior Questionnaire (LEBQ; Konczak et al., 2000). It included 17 items that measured six behaviours: delegation of authority (e.g., 'My manager gives me the authority I need to make decisions that improve work processes and procedures'), accountability (e.g., 'My manager holds me accountable for the work I am assigned to'), self-directed decision making (e.g., 'My manager tries to help me arrive at my own solutions when problems arise, rather than telling me what he/she would do'), information sharing (e.g., 'My manager shares information that I need to ensure high quality results'), skill development (e.g., 'My manager provides me with frequent opportunities to develop new skills') and finally coaching for innovative performance (e.g., 'I am encouraged to try out new ideas even if there is a chance they may not succeed'). Participants were asked to indicate their level of agreement with each statement on a seven-point scale, ranging from (1) *strongly disagree* to (7) *strongly agree*. The questionnaire was found to have satisfactory reliability and criterion validity (Konczak et al., 2000).

Emotional exhaustion was measured using the five items proposed by Maslach and Schaufeli (1993) (e.g., 'I feel emotionally drained from my work'). Participants indicated whether they had recently experienced each of the situations using a 5-point scale, ranging from (1) *strongly disagree* to (5) *strongly agree*. The questionnaire was found to have satisfactory reliability and criterion validity (Schutte et al., 2000; Taris et al., 1999).

The following data were collected: age, gender, occupational position, contract type, working time and seniority.

2.7 | Statistical analysis

2.7.1 | Empowering leadership modelling: Test of a bifactorial structure

Recent studies have used bifactorial models (Gillet et al., 2019; Howard et al., 2016; Tóth-Király et al., 2018). Based on a

multidimensional questionnaire, a bifactorial analysis consists in estimating a global factor from the set of items and then estimating specific factors based on the remaining information from the items, once globality has been taken into account (Gillet et al., 2019; Markon, 2019; Morin, Arens, & Marsh, 2016). If such a model could be validated for empowering leadership, it would then be possible to simultaneously study the global effect of empowering leadership as well as the effect of each of its component behaviours on emotional exhaustion.

The bifactorial structure of empowering leadership at T0 was first investigated according to the method recommended by Morin and colleagues (Gillet et al., 2019; Morin, Arens, & Marsh, 2016). These analyses were performed with Mplus 8.3 software, using the maximum likelihood with robust standard errors (MLR). Four competing models of empowering leadership were assessed (Figure S1): a confirmatory factor analysis (CFA) model with six correlated factors defined by their respective items (i.e., model of Konczak et al., 2000); an exploratory structural equation model (ESEM) with the same six correlated factors, but considering that the items could simultaneously define several dimensions (i.e., cross-loadings; Morin, Arens, & Marsh, 2016), and a bifactor CFA model with seven independent factors: six specific factors defined by their specific items and one global factor defined by all empowering leadership items. Cross-loadings were not allowed and all dimensions were specified as orthogonal (i.e., independent), since the global factor was expected to explain the covariance between the sub-dimensions (Morin, Arens, & Marsh, 2016), and a bifactor ESEM model using the same structure as the bifactor CFA model, but considering that the items could also contribute to define the other specific factors, and not only their corresponding specific factors and the global factor.

Then, an inter-model comparison was performed based on the fit indices obtained and the parameters estimated in the models. The fit of the models was assessed using the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA). A CFI (or TLI) ≥0.90 and 0.95 indicates an acceptable and excellent fit to the data, respectively (Marsh et al., 2009). An RMSEA <0.08 and 0.06 indicates an acceptable and excellent fit, respectively (Marsh et al., 2009). The CFA and ESEM models were compared. The ESEM model was preferred provided that (1) it was well defined, (2) the fit indices were better and (3) the inter-factor correlations decreased when cross-loadings were taken into account (Marsh et al., 2009). Then, the selected CFA or ESEM model was compared to the corresponding bifactor model. The bifactor model was preferred provided that (1) the fit indices were better, (2) the global factor was well defined by the whole set of scale items and (3) the specific factors were correctly defined (Gillet et al., 2019; Morin, Arens, & Marsh, 2016). For each factor, the omega coefficient for composite reliability (ω; Green & Yang, 2015) was also calculated and reported.

2.7.2 | Empowering leadership and emotional exhaustion invariance between T0 and T1

In a second step, the temporal invariance of the empowering leadership and emotional exhaustion measurement models between T0 and T1 was tested. Missing data at T1 (25.56%) were imputed according to previously published recommendations (Buuren, 2018; Graham, 2009), using the full information maximum likelihood (FIML) method that allows direct imputation during model estimates (Graham, 2009; Muthén & Muthén, 2017).

For the invariance tests, the procedure described by Millsap was followed (Millsap, 2012). First, a model with 'configural invariance' (Schmitt & Kuljanin, 2008), assuming that the items were associated with the same constructs at T0 and T1 was assessed (Cheung & Rensvold, 2002). Second, a 'weak invariance' model was specified by adding the constraint of an identical estimate of the item factor loadings at T0 and T1 in addition to the factorial configuration. Third, a 'strong invariance' model was specified by adding the constraint of an identical estimate of the intercepts at T0 and T1. Fourth, a 'strict invariance' model specifying in addition an equality constraint to the item residual variance at T0 and T1 was tested. Then, the 'invariance of variances and covariances' was tested in a fifth model and finally a sixth model with addition of the equality constraints across the latent means between T0 and T1 was tested (i.e., 'invariance of latent means').

Thereafter, the goodness of fit of each model was assessed using the same indices as before, that is, the CFI, TLI and RMSEA. A step-by-step comparison of the six invariant models was then performed, with assessment of the change in CFI, TLI and RMSEA at each step. Based on the thresholds described by Chen (2007), each type of invariance could be confirmed when the observed difference with the previous (less constrained) model was <0.10 for the CFI and TLI and <0.015 for the RMSEA.

2.7.3 | Linear mixed model strategy

Considering the hierarchical structure of the data, all the statistical analyses of the effect of the intervention were performed using linear mixed models (LMM; Singmann & David, 2018). Remember that participants were part of care units, which were themselves integrated into sub-centres. In this configuration, it is not excluded that the observed effect of the intervention (i.e., effect of the sub-centre) on the dependent variables is in fact due to an effect of the care unit (e.g., effect of organizational culture variations between units). The LMM method allowed solving this problem by decomposing the sources of variance between the fixed and random effects (Bliese et al., 2018; Singmann & David, 2018). Fixed effects indicated the effect of one or more independent variables as in a classical linear regression (e.g., sub-centre variable). The random effects consisted in estimating the error term of the model as a function of a variable, the modalities of which structured our sample (e.g., care unit variable), to obtain a more accurate but also more generalizable estimate of the fixed effects investigated (Baayen et al., 2008; Singmann & David, 2018).

The analyses were performed using R software (version 4.1.0) and the lme4 package (Bates et al., 2014), with the restricted maximum likelihood estimator (REML; Corbeil & Searle, 1976; Gilmour et al., 1995). All analyses were performed using the invariant factor

scores (i.e., from the most invariant model), after standardization (mean = 0, standard deviation = 1). Factor scores provide a more accurate estimate of individual levels than the sum of the items, since they take into account measurement errors and factor structure (Morin, Meyer, et al., 2016; Skrondal & Laake, 2001).

For each model, the difference in score between T1 and T0 was considered a dependent variable. Each model included the socio-demographic variables (i.e., age, gender, position, seniority, working time and contract type), the value of the dependent variable at T0 and the sub-centre variable (intervention sub-centre vs. control sub-centre) to test the effect of the intervention. In each model, the care unit variable was specified as a random effect to estimate the mean of the dependent variable for each care unit. In each case, the intra-class correlation coefficient (ICC) was reported. It varied between 0 and 1 and represented the proportion of the variance of the dependent variable explained by the random effect (i.e., care unit variable; Bliese et al., 2018; Nakagawa & Schielzeth, 2013).

2.7.4 | Effect of the intervention on empowering leadership and emotional exhaustion

A series of LMM were used to investigate (1) the effect of the intervention on empowering leadership, (2) the effect of the intervention on emotional exhaustion and (3) the mediating effect of empowering leadership on the relationship between the intervention and emotional exhaustion. First, seven LMMs explaining the evolution of each of the empowering leadership factors were assessed to investigate the controlled effect of the intervention on the evolution of the global factor for empowering leadership (LMM1) and the specific factors for delegation of authority (LMM2), accountability (LMM3), self-directed decision making (LMM4), information sharing (LMM5), skill development (LMM6) and coaching for innovative performance (LMM7). Then, a LMM explaining the evolution of emotional exhaustion (LMM8) was assessed to investigate the controlled effect of the intervention on the evolution of emotional exhaustion. The model was also fitted to the global factor and the six specific factors for empowering leadership at T0 to investigate the predictive effect of empowering leadership on the evolution of emotional exhaustion at 1 year.

Finally, a hierarchical regression approach was used to assess a ninth LMM similar to LMM8, but in which a fixed effect accounting for the evolution of the global factor and the six specific factors for empowering leadership was also specified (LMM9). According to Baron and Kenny's (1986) criteria, we could conclude that the evolution of empowering leadership had a mediating effect on emotional exhaustion provided that (1) the effect of the intervention on the evolution of empowering leadership and emotional exhaustion was statistically significant (i.e., with LMM1-LMM8), (2) the effect of the evolution of empowering leadership on the evolution of emotional exhaustion was statistically significant (i.e., with LMM9) and (3) the introduction of empowering leadership in the explanation of the evolution of emotional exhaustion contributed to decrease the value of the regression coefficient of the intervention (i.e., LMM9 vs. LMM8).

3 | RESULTS

3.1 | Participants and sample characteristics

A total of 981 participants were included (566 from the intervention sub-centre and 415 from the control sub-centre), with an overall participation rate of 63% at T0 and a follow-up rate of 67% at 1 year (Table 1). Nurses, nursing assistants and secretaries demonstrated the best participation rate at T0 (ranging from 76 to 81%), followed by physicians and hospital service workers (ranging from 32% to 53%). The data of 751 participants who did not change care units between T0 and T1 and who did not receive a quality-of-life support in the workplace in the control sub-centre were included in the analyses. This choice was made to ensure that the observed changes in empowering leadership scores reflected an effect of the intervention and not a change in participants' unit or an 'experimental bias' in the control sub-centre. The sociodemographic variables, as well as empowering leadership and emotional exhaustion scores before modelling, are detailed in Table S1. At baseline, the empowering leadership and emotional exhaustion scores did not significantly differ between the intervention and control sub-centres.

3.2 | Fitting of the empowering leadership measurement models

The fit indices for the four tested models are presented in Table 2. The standardized factor loadings of the items (λ), the residual variance of the items (δ) and the fidelity of the dimensions are presented in Table S2 for the four empowering leadership models. The correlation coefficients between the latent factors for the CFA and ESEM models are presented in Table S3. The four empowering leadership models showed an overall satisfactory fit, with the exception of the CFA model in which the TLI was 0.896. The bifactor ESEM model was the model that best fitted the data for all indices.

3.3 | ESEM versus CFA

The ESEM model better fitted the data than the CFA model. Empowering leadership dimensions were correctly defined by the dedicated items, in both the CFA (λ = 0.406–0.915) and ESEM models (λ = 0.246–0.929). In the ESEM model, numerous cross-loadings were observed, and they were systematically lower than the loadings of the items dedicated to the dimensions (λ = 0.001–0.263). Finally, the correlations between the factors were decreased in the ESEM model compared to the CFA model. All these findings supported the superiority of the ESEM model over the CFA model.

3.4 | ESEM versus bifactor ESEM

The bifactor ESEM model was overall well defined. The empowering leadership items were associated with high and statistically significant

TABLE 1 Study sample

Category	Participation at T0		Participation at T0 and T1		Participation at T0 without change in unit at T1 and without participation in a W-QoL support in the control SC
	n	Participation rate (%)	n	Follow-up rate (%)	n
Intervention SC	566	67	363	64	441
Control SC	415	59	291	70	310
Total	981	63	654	67	751
Intervention SC					
Nurses	260	78	161	62	205
Nursing assistants	135	70	83	61	113
HSW	20	53	8	40	15
Secretaries	48	80	36	75	43
Physicians	72	50	35	49	43
Others	31	NA	26	84	22
Control SC					
Nurses	130	76	96	74	99
Nursing assistants	117	80	82	70	96
HSW	16	32	11	69	10
Secretaries	39	81	25	64	28
Physicians	86	38	49	57	60
Others	27	NA	22	81	17

Abbreviations: HSW, hospital service workers; NA, not applicable; SC, sub-centre; W-QoL, quality of life in the workplace.

TABLE 2 Fit results of the measurement models

	χ^2 (df)	CFI	TLI	RMSEA	90% CI	$\Delta\chi^2$	Δdf	ΔCFI	ΔTLI	ΔRMSEA
Alternative models for measuring empowering leadership at T0										
CFA	564.653 (104)*	0.920	0.896	0.070	[0.064; 0.075]					
Bifactor CFA	403.212 (102)*	0.948	0.931	0.057	[0.051; 0.063]					
ESEM	114.023 (49)*	0.989	0.969	0.038	[0.029; 0.047]					
Bifactor ESEM	59.017 (38)*	0.996	0.987	0.025	[0.011; 0.036]					
Alternative models for measuring empowering leadership at T1										
CFA	435.238 (104)*	0.920	0.895	0.075	[0.068; 0.083]					
Bifactor CFA	347.144 (102)*	0.941	0.921	0.066	[0.058; 0.073]					
ESEM	126.115 (49)*	0.981	0.948	0.053	[0.042; 0.065]					
Bifactor ESEM	97.281 (38)*	0.986	0.949	0.053	[0.040; 0.066]					
Invariant models of empowering leadership (bifactor ESEM) and emotional exhaustion (CFA) at T0 and T1										
Configural invariance	1,086.531 (657)*	0.969	0.955	0.030	[0.026; 0.033]	-	-	-	-	-
Weak invariance	1,163.343 (731)*	0.968	0.959	0.028	[0.025; 0.031]	76.812	74	−0.001	0.004	−0.002
Strong invariance	1,179.087 (745)*	0.968	0.960	0.028	[0.025; 0.031]	15.744	14	0.000	0.001	0.000
Strict invariance	1,288.893 (767)*	0.962	0.953	0.030	[0.027; 0.033]	109.806	22	−0.006	−0.007	0.002
Variance–covariance invariance	1,345.332 (796)*	0.960	0.952	0.030	[0.027; 0.033]	56.439	29	−0.002	−0.001	0.000
Invariance of latent means	1,360.615 (804)*	0.959	0.952	0.030	[0.028; 0.033]	15.283	8	−0.001	0.000	0.000

Abbreviations: χ^2, Khi^2 test; CFA, confirmatory factor analysis; CFI, comparative fit index; df, degree of freedom; ESEM, exploratory structural equation modelling; RMSEA, root mean square error of approximation; TLI, Tucker-Lewis index; 90% CI = 90% confidence interval for the RMSEA.
*$p < 0.01$.

factor loadings for the global factor ($\lambda = 0.124–0.717$). Overall, the specific factors were well defined by their dedicated items ($\lambda = 0.062–0.716$) except for item 12 related to self-directed decision making that was associated with a very low and non-significant loading for its specific factor. Nevertheless, the dimension remained well defined by the other dedicated items ($\lambda = 0.528–0.571$), as well as the other specific factors. Thus, (a) the bifactor ESEM model showed an excellent and better fit than the ESEM, CFA and bifactor CFA models, and (b) both the global factor and specific factors were well defined. In addition, further analyses revealed an excellent fit (Table 2), and a good definition of the bifactor ESEM model of empowering leadership at T1 (Table S4). Therefore, the bifactor ESEM model could be considered the best model to be used.

3.5 | Invariance in the empowering leadership (bifactor ESEM) and emotional exhaustion (CFA) models between T0 and T1

The fit indices of the six invariant models as well as their evolution when invariance constraints were added are presented in Table 2. The configural invariance was confirmed, with an excellent fit to all criteria. Adding stepwise invariance constraints in the five successive models did not significantly lower the goodness of fit (i.e., ΔCFI < 0.010, ΔTLI < 0.010 and ΔRMSEA <0.015). Thus, there was a full invariance in the model integrating empowering leadership and emotional exhaustion at T0 and T1. The factors related to empowering leadership and to emotional exhaustion were well defined (Table S5).

3.6 | Effect of the intervention on empowering leadership

LMM1 for the global factor for empowering leadership and LMM8 and LMM9 for emotional exhaustion are shown in Table 3. The ICCs were negligible (i.e., ICC < 0.05; LeBreton & Senter, 2008). However, the random effect remained included in the models to control the care unit effect (Bliese et al., 2018). As expected, the effect of the intervention on the evolution of the global factor for empowering leadership between T0 and T1 (LMM1) was statistically significant. However, the increase in global factor for empowering leadership in the intervention sub-centre was not significant (change = +0.028; 95% CI [−0.062, 0.118]), whereas a statistically significant decrease was observed in the control sub-centre (change = −0.112; 95% CI [−0.213, −0.011]). Thus, the intervention stabilized the level of the global factor for empowering leadership in the intervention sub-centre, in a context of decreased level of global factor for empowering leadership observed in the control sub-centre. Therefore, Hypothesis H1 could be considered as partially validated. In addition, the intervention had no significant effect on the evolution of the specific factors (LMM2-LMM7; Table S6).

3.7 | Effect of empowering leadership on emotional exhaustion

The global factor for empowering leadership at T0 and its evolution between T0 and T1 were negatively associated with the evolution of emotional exhaustion (LMM8 and LMM9). Furthermore, the specific factors for delegation of authority and information sharing at T0, as well as the specific factor for coaching for innovative performance, were negatively associated with the evolution of emotional exhaustion (LMM8). On the other hand, the specific factor for self-directed decision making at T0, as well as its evolution between T0 and T1, was positively associated with the evolution of emotional exhaustion (LMM9). Note that the effect of the specific factor for self-directed decision making accounted for 1.4% of the variance of the evolution of emotional exhaustion, compared to 9.2% for the global factor and the other specific factors for empowering leadership (Table S7). Thus, empowering leadership had mixed effects on emotional exhaustion at 1 year, but its effects were more protective than exhausting.

3.8 | Effect of the intervention on emotional exhaustion

The effect of the intervention on the change in emotional exhaustion between T0 and T1 (LMM8) was statistically significant. Nevertheless, the decrease in emotional exhaustion in the intervention sub-centre was not significant (change = −0.050; 95% CI [−0.112, 0.013]), whereas a statistically significant increase was observed in the control sub-centre (change = +0.087; 95% CI [0.015, 0.159]). Thus, the intervention stabilized the level of emotional exhaustion, in a context of increased emotional exhaustion as evidenced in the control sub-centre. Therefore, Hypothesis H2 could be considered as partially validated.

3.9 | Effect of the intervention on emotional exhaustion mediated by empowering leadership

The comparison of the regression coefficient for the sub-centre variable (intervention sub-centre versus control sub-centre) between MLM8 and MLM9 showed a decrease in the effect size of the intervention, after the inclusion of the change in empowering leadership between T0 and T1 in the explanation of emotional exhaustion. Furthermore, the effect of the intervention remained statistically significant, and the change in global factor for empowering leadership indicated a significant effect on the change in emotional exhaustion in MLM9. Therefore, in line with Baron and Kenny's (1986) criteria, we could conclude that the evolution of the global factor for empowering leadership partially mediated the effect of the intervention on the evolution of emotional exhaustion. Note that the mediating effect was also observed when only the evolution of the global factor for empowering leadership (without the evolution of the specific factors) was considered in the explanation of emotional exhaustion (Table S8).

TABLE 3 Linear mixed models for measuring the global factor for empowering leadership and emotional exhaustion evolution between T0 and T1

	LMM1: GF for EL			LMM8: EE			LMM9: EE		
Random effect	var.	SD	ICC	var.	SD	ICC	var.	SD	ICC
CU	0.022	0.150	0.046	0.007	0.083	0.023	0.005	0.068	0.017
Residuals	0.468	0.684		0.294	0.543		0.266	0.516	
Fixed effect	*b*	*SE*	*p*	*b*	*SE*	*p*	*B*	*SE*	*p*
Intercept	0.172	0.172	0.319	0.026	0.135	0.848	0.075	0.128	0.559
Male versus									
Female	−0.072	0.090	0.421	0.009	0.071	0.904	−0.005	0.068	0.940
Age	−0,004	0.003	0.175	0.000	0.002	0.871	0.000	0.002	0.962
Seniority in the CHU	0,000	0.002	0.965	0.002	0.002	0.215	0.002	0.002	0.158
Seniority in the CU	0,001	0.002	0.727	−0.001	0.002	0.770	−0.001	0.002	0.627
Position: Nurses versus									
Nurse assistants	−0.057	0.064	0.372	0.068	0.052	0.187	0.048	0.049	0.333
Physicians	0.008	0.097	0.933	−0.024	0.079	0.761	−0.038	0.075	0.610
Secretaries	0.027	0.095	0.775	**−0.217**	**0.075**	**0.004**	**−0.205**	**0.071**	**0.004**
HSW	−0.200	0.147	0.174	0.147	0.118	0.212	0.083	0.112	0.461
Nursing managers	−0.150	0.188	0.426	−0.275	0.150	0.066	**−0.334**	**0.143**	**0.020**
Chief medical officers	0.305	0.298	0.305	−0.383	0.235	0.104	−0.297	0.224	0.184
Others	0.027	0.151	0.858	−0.082	0.121	0.498	−0.118	0.115	0.306
Contract: Probationary period versus									
Officials	0.027	0.131	0.835	−0.122	0.103	0.240	−0.128	0.098	0.191
Fixed-term contract	−0.037	0.153	0.811	−0.144	0.122	0.238	−0.182	0.116	0.116
Permanent contract	0.205	0.423	0.629	−0.364	0.339	0.283	−0.351	0.323	0.277
Working full-time versus									
Part-time	−0.016	0.057	0.778	0.027	0.045	0.558	0.033	0.043	0.446
Exhaustion at T0				**−0.304**	**0.023**	**0.000**	**−0.282**	**0.026**	**0.000**
GF for EL at T0	**−0.449**	**0.028**	**0.000**	**−0.076**	**0.023**	**0.001**	**−0.162**	**0.027**	**0.000**
SF for Dele. at T0				**−0.088**	**0.024**	**0.000**	**−0.074**	**0.030**	**0.014**
SF for Acc. at T0				0.013	0.024	0.588	−0.029	0.029	0.309
SF for Self. at T0				−0.005	0.025	0.836	**0.082**	**0.034**	**0.017**
SF for Info. at T0				**−0.070**	**0.025**	**0.006**	−0.051	0.030	0.089
SF for Skills. at T0				0.001	0.023	0.964	−0.041	0.027	0.127
SF for Innov. at T0				0.013	0.027	0.631	−0.002	0.030	0.940
ΔGF for EL							**−0.267**	**0.033**	**0.000**
ΔSF for Dele.							−0.008	0.030	0.780
ΔSF for Acc.							−0.057	0.040	0.159
ΔSF for Self.							**0.136**	**0.037**	**0.000**
ΔSF for Info.							0.068	0.042	0.104
ΔSF for Skills.							0.000	0.042	0.993
ΔSF for Innov.							**−0.203**	**0.057**	**0.000**
Intervention-SC versus									
Control-SC	**−0.140**	**0.069**	**0.047**	**0.137**	**0.135**	**0.007**	**0.094**	**0.045**	**0.042**
R^2		0.316			0.256			0.330	
ΔR^2					-			**0.073**[**]	

Note: Statistically significant parameters are indicated in bold ($p < .05$).

Abbreviations: ΔR^2, difference in explained variance; Acc., accountability; *b*, non-standardized regression coefficient; CU, care unit; Dele., delegation of authority; EE, emotional exhaustion; EL, empowering leadership; GF, global factor; HSW, hospital service workers; ICC, intra-class correlation; Info., information sharing; Innov., coaching for innovative performance; *p*, *p* value; R^2, percentage of variance explained; SC, sub-centre; SD, standard deviation; SE, standard error of the coefficient; Self., self-directed decision making; SF, specific factor; Skills., skills development; var., variance.

*$p < 0.05$. **$p < 0.01$.

[Correction added on 7 November 2022, after first online publication: In the last column of the 'Female' row entry, 0,940 has been corrected to 0.940 in this version.]

4 | DISCUSSION

4.1 | Bifactorial model of empowering leadership

Our results clearly showed the superiority of the bifactorial model of empowering leadership at T0 and T1. This indicates, at the psychometric level, that the items of Konczak et al. (2000) simultaneously reflect several constructs (i.e., multidimensionality; Morin, Arens, & Marsh, 2016), and by extension that the six empowering behaviours initially proposed by Konczak et al. (2000) actually cover several managerial realities: a global phenomenon, characterized through the global factor by the implementation of all the empowering behaviours, and a specific phenomenon, characterized through the specific factors by the independent implementation of the behaviours of delegation of authority, accountability, self-directed decision making, information sharing, skill development and coaching for innovative performance. In other words, our results indicate that managers can engage in the entire set of empowering behaviours or, selectively, in each of the specific empowering behaviours.

The identification of a global factor is consistent with the literature. Indeed, the latest empowering leadership scales propose to group different empowering behaviours into a limited number of encompassing factors (e.g., the two-dimensional scale of Amundsen & Martinsen, 2014). In addition, many studies have used a single composite factor for empowering leadership (Cheong et al., 2019; Pearce et al., 2003). However, the fact that specific factors were well defined once the global factor was considered showed the limitations of a parsimonious model of empowering leadership. Such a model might not capture the specificity of certain behaviours and their consequences.

4.2 | Effect of the intervention

As expected, the effect of the intervention on the change in both global factor for empowering leadership and emotional exhaustion between T0 and T1 was statistically significant. However, this significant effect of the intervention was more related to a significant deterioration of the global factor for empowering leadership and emotional exhaustion in the control sub-centre than to an improvement in the indicators in the intervention sub-centre. In our opinion, the evolution observed in the control sub-centre could reflect delayed and/or lasting effects of policies setup within the university hospital complex prior to the research study. Indeed, the facility implemented numerous 'reorganizations' in all its sub-centres in 2013 and 2014 (i.e., 4 years before the intervention), in order to direct its activity towards ambulatory care and to reduce its expenses. All sub-centres were concerned. However, until today, the occupational health service of the university hospital complex has regularly warned about the consequences of these transformations on health, noting increased exhaustion in the whole facility (Tripodi et al., 2014, 2016). In this sense, the literature indicates that organizational transformations foster exhaustion (Day et al., 2017; Koppel et al., 2015). In addition, the demands made to individuals could affect emotional exhaustion up to

5 years later (Aronsson et al., 2017; Seidler et al., 2014). Moreover, emotional exhaustion implies a loss of personal resources and thus a decrease in coping capacity, which in turn could further increase the level of exhaustion in an upward spiral (Bakker & Costa, 2014). Thus, the past transformations (in 2013 and 2014), as well as the related exhaustion generated at this time, could explain the increase in emotional exhaustion observed between T0 and T1 in the control sub-centre (i.e., between 2018 and 2019). Considering that the intervention and control sub-centres were reorganized over the same period (i.e., that the two sub-centres were comparable; Tripodi et al., 2016, 2014), our findings suggested that the intervention allowed at least stopping the progression of emotional exhaustion in the intervention sub-centre.

Regarding the evolution of empowering leadership in the control sub-centre, it should be specified that most of the past reorganizations were implemented in an authoritative manner by the management (Gambert, 2020; Tripodi et al., 2016). It should also be recalled that the leadership style adopted by the top-level management influences front-line management practices (Brown & Treviño, 2014; Davids et al., 2019; Migneault et al., 2009). Therefore, it seemed reasonable to assume that the past managerial behaviour of the university hospital complex top-level management could still influence the managerial behaviour of the middle- and front-line management within the facility. Moreover, qualitative parameters identified in the analysis of the accompaniment phase indicated the maintenance and presence of a directive leadership in the university hospital complex management during the research study. During step 3 (i.e., month 5) of the intervention, one of the chief medical officers directly contacted the general director to request the removal of his department from the intervention programme, because he did not want to implement empowering leadership. Despite the clear commitment of the sub-centre management, but also of the department's nursing managers and medical teams, the general director supported the chief medical officer's request. Subsequently, we observed the deprogramming of the general director in the steering committee meeting agenda. In our opinion, this concrete case could more generally reflect the directive leadership style adopted by the general director within the university hospital complex. In this sense, the principal investigator had to negotiate twice to postpone reorganizations in the intervention sub-centre, which the top-level management of the university hospital complex had been unilaterally decided to implement during the accompaniment phase. Regarding the influence of the top-level management on front-line management behaviours (Brown & Treviño, 2014; Carney & Getz, 2016; Migneault et al., 2009), the directive leadership style of the top-level management of the university hospital complex, and more precisely of the general director, could explain the decrease in global factor for empowering leadership observed in the control sub-centre. Considering that the intervention sub-centre depended on the same top-level management at the university hospital complex level, we could assume that the intervention protected the intervention sub-centre from the decrease in global factor for empowering leadership observed in the control sub-centre.

4.3 | Effect of empowering leadership on emotional exhaustion

In this study, we showed that changes in the global factor for empowering leadership during the intervention partially mediated the effects of the intervention on emotional exhaustion. In other words, part of the protective effects of the intervention against increased emotional exhaustion was related to the fact that the intervention protected the intervention sub-centre from a decline in global factor for empowering leadership. To our knowledge, this is the first controlled study to show the protective effect of empowering leadership against increased emotional exhaustion at 1 year. Furthermore, we showed that the specific factors for delegation of authority, information sharing and coaching for innovative performance were negatively associated with emotional exhaustion at 1 year. Based on our findings, empowering leadership could be considered a job resource, likely to increase the ability of employees to cope with their job demands, in line with the results of recent studies (Kim, Moon, & Shin, 2018; Kim & Beehr, 2018; Tripathi & Bharadwaja, 2020).

On the other hand, we found that the level of the specific factor for self-directed decision making contributed to increase emotional exhaustion at 1 year, when the positive effect of the global factor for empowering leadership was taken into account. Thus, the incentive and expectation of autonomy in decision making raised by the manager/supervisor could be an exhausting demand. This result was consistent with (a) the hypothesis of Cheong et al. (2016) that the autonomy induced by empowering leadership could be a stressful demand for employees and, more generally, (b) with the contrasting literature on autonomy (Kubicek et al., 2017). Although autonomy is mainly considered a resource (Bakker & Demerouti, 2017), some studies have indicated that it requires an effort, insofar as employees must make decisions by themselves about the method or planning of the work for example (Kubicek et al., 2017).

In any case, we found that empowering leadership was much more protective ($R^2 = 9.2\%$) than exhausting ($R^2 = 1.4\%$). Therefore, our results support the fact that empowering leadership should be promoted in hospitals to decrease health care team emotional exhaustion.

4.4 | Limitations

Our results need to be confirmed in other samples, especially since the adoption and effect of empowering leadership may vary according to cultural and organizational contexts (Blume et al., 2010; Cheong et al., 2019; Davids et al., 2019). Furthermore, even if randomized design is a strong method to control for the confounding variables inherent to the organizational culture, there is a risk that the experimental and control groups will not be completely comparable (regarding organization and culture), especially when the study is conducted on only two sub-centres. However, as we matched them effectively, no differences were observed at baseline between the sub-centres with respect to empowering leadership. In addition, the use of LMM allowed us to control for the sub-centres differences that would rely

on care unit's differences in terms of organization and culture. But despite this, there could still remain organizational culture differences between the two sub-centres (that would rely directly on the sub-centres level) that could bias the effect estimate we obtained for the intervention. Although this is expensive and challenging to coordinate, future experimental studies could address this limitation by replicating this study on a large number of randomly drawn sub-centres.

5 | CONCLUSIONS

Our quantitative and qualitative results showed the value of implementing systemic interventions, targeting all hierarchical levels of the organization, in order to protect against a decrease in empowering leadership in hospitals. To our knowledge, this is the first controlled interventional study to test the effect of a multi-level intervention on the evolution of empowering leadership in a large organization. Regarding this point, we empirically confirmed some findings from ethnographic studies that have assessed the evolution of empowering or 'liberating' managerial practices in professional organizations (Carney & Getz, 2016; Davids et al., 2019; Getz, 2009), in particular the importance of transforming practices at all levels of the organization, starting with the CEO.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

Although empowering leadership was largely more protective than exhausting, our results support the importance of adopting all the empowering behaviours to ensure positive effects on emotional exhaustion. More concretely, managers should be informed that they must be ready to share power, support and recognize employees' responsibility before inviting them to be autonomous. In doing so, they could help prevent employee emotional exhaustion. Conversely, managers who would engage selectively in autonomy-inviting behaviour without sharing power, supporting and recognizing employees' responsibility could foster emotional exhaustion.

Considering the systemic nature of empowering leadership and the effect we found of the intervention, we strongly encourage CEOs and top-managers to support middle and front-line managers in implementing all empowering behaviours. For this purpose, our results show the interest of combining (a) empowering leadership education, (b) direct field empowering leadership training and (c) coaching at all hierarchical levels of the facility. Furthermore, beyond support, our findings invite top-managers to personally engage alongside middle and front-line managers in meeting and empowering front-line employees. The fact that we were able to implement the intervention with two meetings per year per unit with top-managers, totalling 41 meetings in the intervention sub-centre, demonstrates that it is doable. However, we invite CEOs to ensure that they are prepared to sustain such a process over the long term, in order to foster a true and sustainable transformation of the managerial culture towards empowering leadership.

On this point, we believe that the effect of our intervention could be improved after some adjustments to the protocol. First, an informed consent form signed by the General director (or CEO) could be a criterion for including the hospital in the intervention, in order to reinforce the commitment of this essential stakeholder in the transformation of the facility (Davids et al., 2019; Getz, 2009). Second, individual coaching could be extended to the general director (or CEO), and performed by leaders with personal experience in such a transformation of their organization. Such a coaching could reinforce adherence to empowerment via identification mechanisms (Blume et al., 2010; Brown & Treviño, 2014) but also, more simply, reassure the directors in times of doubt inherent in the transformation (Davids et al., 2019).

In addition, the support of medical chief officers could be strengthened by preferring 'quality of care' to 'quality of life in the workplace' in the objectives of the intervention. Indeed, we repeatedly observed that 'quality of life in the workplace' was not a mobilizing topic for physicians, in particular for department heads. Considering their strong commitment to innovation in medical care, we could assume that the quality of care would be more mobilizing and would allow limiting the risk of medical opposition to empowering leadership.

In any case, our study strongly showed the protective effect of empowering leadership against emotional exhaustion at 1 year. However, we found that the effects of the tested protocol were moderate, although quite encouraging, considering the social tensions that hospitals are currently facing.

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CONFLICT OF INTEREST

The authors have no competing interest to declare.

ETHICS STATEMENT

The research protocol was approved by the Nantes University Hospital Ethics Committee (i.e., GNEDS, *Groupe Nantais d'Éthique dans le Domaine de la Santé*) under the reference number GNEDS02122018 and is registered in the ClinicalTrials.gov register under the reference number NCT04010773. All methods were performed in accordance with guidelines of the Declaration of Helsinki. This study was conducted as part of the Chrysalide research project (Cougot et al., 2019).

AUTHOR CONTRIBUTIONS

BC and JG designed the study and took on the role of principal investigator and study coordinator, respectively. NG, DT, LM and IG participated in the design of the intervention. BC defined the psychometric indicators and formalized the psycho-social objectives of the research study under the supervision of NG. GFB and LM coordinated the design of the study methodology. BC performed the statistical analysis under the supervision of PC and NG. All authors contributed to the drafting of the present manuscript and proposed changes to the draft proposed by BC. All authors read and approved the manuscript.

DATA AVAILABILITY STATEMENT

The data collected in the study will be available from the corresponding author on reasonable request from 3 years after the end of the study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

REVIEW ARTICLE

Factors influencing the transition and retention of mental health nurses during the initial years of practice: Scoping review

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Abstract

Aim: This review aims to identify the factors influencing the transition and retention of mental health nurses during the initial years of practice, recognize gaps in the literature and propose evidence-based strategies.

Background: Mental health is a challenging specialty; recruitment, transition and retention of mental health nurses are known issues of concern.

Evaluation: The present study undertakes a scoping review to identify factors influencing the transition and retention of mental health nurses during the initial years of practice and the gaps in that research domain. A literature search was conducted using electronic databases. To gain an understanding of the topic of interest, the review of the literature extended from 2000 to 2022.

Key issues: Existing evidence focuses on specific perspectives of transition. There is limited literature on factors influencing transition and retention among mental health nurses. Findings suggested that personal and professional factors could influence the transition and retention of mental health nurses during the initial years of practice. The main themes identified were personal attributes and professional factors with a number of subthemes.

Conclusion: The scoping review identified only a few studies, which showed personal and professional factors related to the transition and retention of mental health nurses at the early stages of their career.

Implications for nursing management: Potential benefits of effective transition and support with the understanding of factors influencing transition and retention of early career mental health nurses will enhance staff morale, sustainability of the workforce and better patient outcomes. Additionally, a few recommendations for nurse managers and leaders to improve transitional experiences and retention of early career nurses are highlighted.

1 | INTRODUCTION

Mental health is a challenging specialty for various reasons (Joseph et al., 2022) such as the need for advanced training and qualifications, a volatile work environment, stigma toward mental illness, safety concerns and the need to establish a therapeutic relationship with clients with mental illness (Joubert & Bhagwan, 2018; The Productivity Commission, 2020). Mental health nurses are the largest workforce in mental health in Australia (Australian Institute of Health and Welfare [AIHW], 2020; World Health Organization [WHO], 2020) and many other countries. Recruitment, transition and retention of mental health nurses are a global concern. Several factors can affect the transition and retention of newly qualified nurses working in mental health. Furthermore, new graduate nurses transitioning to clinical practice face a high level of stress. They often feel overwhelmed by the challenges of the unfamiliar work environment. As they move from student nurses to registered nurses, their workload and responsibilities increase, expectations from the public, their managers and superiors from their organizations' increase, and organizational pressure to perform also increases along with specialty-specific challenges (AIHW, 2020; WHO, 2020).

2 | BACKGROUND

Transition is referred to as the process of changing from one condition to another along with roles and responsibilities (Meleis, 2010). Nurse retention is defined as the ability of an organization to keep its employees (Siddiqui & Jamil, 2015). A mental health nurse is a registered nurse who specializes in working with people with mental illness (AIHW, 2020). According to the Victorian Mental Health Wellbeing and Workforce Strategy (Department of Health, 2021), specialist skills for clinical staff in mental health require additional training after general nursing qualifications (Bachelor of Nursing). Graduate programmes in mental health can last for 1–2 years with or without postgraduate training. Concerns regarding the attrition of early career nurses were highlighted in the Australian context (Health Workforce Australia, 2012). Djukic et al. (2013) define early career nurses as nurses who practised nursing for less than 5 years. In this study 'the initial years of practice' refer to the first 3 years of practice in mental health nursing.

Nurse retention, particularly during the initial years of practice is a significant common problem across the world (Van Camp & Chappy, 2017). A study conducted in America showed that about 17.5% of new registered nurses leave their job within 1 year of starting jobs, with an additional one-third leaving within 2 years. The average nurse turnover rate is 19.1%, and a nursing vacancy rate of 8% exists (Kovner et al., 2014). Another large study from Australia showed an average annual nurse turnover rate of 15.1% (Roche

et al., 2015). Likewise, an international study also indicated that the attrition rates of new graduate nurses in their first year of practice range between 30% and 60% (Krugman et al., 2006; Goode et al., 2013). This has a heavy impact on the sustainability and skill mix of the workforce (Parker et al., 2014; Rush et al., 2013). Additional impacts of attrition could be emotional and financial struggles for nurses and financial implications and health care services (Goode et al., 2013).

Existing literature indicates a shortage of mental health nurses in Australia (Department of Health, 2021) with more shortages expected. Interestingly, 22.3% of current mental health nurses are aged 45 or above with 31.3% aged 55 and older (AIHW, 2020). This indicates a predictable shortage of mental health nurses in the next 10 years. At the same time, the World Health Organization also has predicted a worldwide shortage of nurses by 2030 (World Health Organization, 2020). Shortage and deficits of mental health nurses can affect health outcomes and the quality of care offered to patients with mental illness (Chiao et al., 2021). Additionally, the Australian College of Mental Health Nurses (ACMHN) submission in the Productivity Commission Inquiry (2020) pointed out that the Australian health care system predicted it would be unable to meet the mental health nursing demand without developing a mental health workforce. In the United Kingdom, there is an existing shortage of 40% of mental health nurses (Beech et al., 2019). A large survey ($n = 498$) of Victorian mental health nurses identified that young mental health nurses under 4 years of experience highlighted a high level of stress and lowered mental health (Foster et al., 2021) and suggested that new graduate mental health nurses need urgent support.

Nursing turnover within the first year varies between 5% and 60%, and literature from Australia suggests annual turnover between 12% and 38% (Hayes et al., 2012; Mills et al., 2016). The issues associated with retention within the early years of practice are consistently echoed in the literature (Government of Australia, 2020; Hayes et al., 2012; Mills et al., 2016). Low levels of retention and higher turnover in mental health than in general settings were already mentioned in the international context (Adams et al., 2021; Buchan et al., 2019). Furthermore, mental health care in rural and remote areas is covered by mental health nurses (National mental health workforce strategy, 2021–2031). Recruitment and retention are also challenging in this area (Australian Nursing and Midwifery Foundation, 2021).

In this context, recruitment, positive transition and retention are vital to ensure quality mental health services. Understanding the factors influencing the transition and retention of new mental health nurses is essential for a sustainable mental health workforce. There are several earlier studies completed in different countries on factors influencing the retention and transition of nurses during the initial years of practice in the general hospital setting and specific nursing specialties. However, only a few of those earlier studies exploring

nurses' transition and retention topics were focused on mental health nurses.

3 | METHODS

3.1 | Design

A scoping review was conducted to map the research completed in this area and identify any existing knowledge gaps. This review method was adopted due to the nature of the topic and the flexibility to include a range of articles using various methodologies without the need for an individual quality appraisal (Pham et al., 2014). The information available in the literature about factors influencing transition experiences and retention of mental health nurses in the early stages of their careers was sought. The titles and abstracts of the papers were screened using Covidence software (Covidence systematic review software, n.d.). Two authors (S. J. and B. J.) screened the titles and abstracts of each paper and assessed them for relevance based on the inclusion and exclusion criteria. Irrelevant articles and duplicates were excluded. Studies were reviewed in full when identified as relevant based on the content of the abstract. In addition, the reference lists of pertinent papers were screened for additional articles. The study protocol was not registered. PRISMA-ScR checklist was followed to ensure adherence to scoping review guidelines.

3.2 | Search methods and inclusion/exclusion criteria

The key phenomenon of interest in this review was the factors influencing the transition of nurses during the initial years of practice in mental health. The PICo framework was used to develop the review question. The studies used for this review were identified based on the PICo criteria outlined: Population—mental health nurses; interest—factors influencing transition and retention; context—during the initial years of practice. Eligible studies included original peer-reviewed research articles, relevant reviews on transition experiences, factors influencing transition, and retention to mental health nursing and published in the English language. The search extended to peer-reviewed research articles published between 2000 and 2022 due to the significant advancement of mental health training and practices in the past 20 years. The exclusion criteria included articles not addressing factors influencing the transition and retention of mental health nurses during the initial years of practice or not exploring relevant experiences, or research articles focused only on general nurses.

The search strategy used was MeSH terminology and keywords, to identify all relevant studies on the topic. Then the Boolean operators 'OR' and 'AND' were used to combine results. The literature for this review was completed by searching the following electronic databases in 2021 and the last search was conducted in January 2022. Academic Search Complete, CINAHL Complete, MEDLINE, EBSCO, Pubmed, Web of Science and PsycINFO. A combination of search terms has been used. Key terms were searched individually and together using Boolean logic and proximity indicators for the various databases. As given ((MH 'New Graduate Nurses') OR (MH 'Novice Nurses') OR ('graduate* N3 nurs*') OR ('novice* N3 nurs*') OR ('first-year' N3 nurs*) OR ('newly employ*') OR ('first-year' N3 practice) ((MH 'Psychiatric Nursing') OR ('mental health' N4 nurs*))((('Psychiatric Nurses') OR ('mental health' Near/4 nurs*)))) AND TS = (('New Graduate Nurses') OR ('Novice Nurses') OR ('graduat* Near/3 nurs*') OR ('novice* Near/3 nurs*') OR ('first year' Near/3 nurs*') OR ('newly employ*') OR ('first year' Near/3 practice)) (Retention) (staff retention), (nurse retention). ([MH 'Nurses+'] OR nurse*) AND (transition* OR retention* OR [MH 'Personnel Retention']) AND ((initial N3 year*) OR (early N3 year*) OR (graduate* N3 year*) OR (new* N3 graduate*)).

4 | FINDINGS

A total of 1159 studies were identified and out of those, 361 studies were removed mainly due to duplicates. Title and abstract reviews of 808 studies were conducted using Covidence software and 471 were excluded due to irrelevance. Full texts of 338 studies were retrieved and reviewed. Rigour was ensured through the independent review by two authors. The discrepancies were discussed, and the decision was made in agreement with the two authors. A hand search of the reference list was carried out to capture additional papers and yielded one additional study. Full texts were accessed if the abstract needed further clarification. Twelve studies that met the inclusion criteria and were relevant to the scoping review question were included in this review. Figure 1 shows the PRISMA flow chart of the search (McGowan et al., 2020; Page et al., 2021), and Table 1 demonstrates the details of the included articles.

Most of the studies included in this review were qualitative ($n = 9$) and other studies ($n = 3$) were quantitative. Countries of origin were Australia ($n = 1$), Canada ($n = 2$), the USA ($n = 2$), Taiwan, Finland, South Africa, Iran, the United Kingdom, China and Korea ($n = 1$ from each country). The terms mental health nurses' and psychiatric nurses were interchangeably used in the literature for nurses caring for individuals with mental health disorders. 'New mental health nurses' and 'graduate nurses' were also used in the literature for nurses with less than 2 years of experience. All studies ($n = 12$) focused mainly on the transition experiences of new mental health nurses. An overview of the literature identified is portrayed in Table 1. Additionally, further review and analysis of identified literature elicited a few subthemes. The review elicited two main themes: personal factors and professional factors and six subthemes: sense of belongingness, self-efficacy and self-awareness, team dynamics and collegiality, workplace culture, mentorship and support and professional development.

4.1 | Personal attributes

The influence of personal factors on the transition and retention of mental health nurses had been identified in the literature (Ho

FIGURE 1 PRISMA flow chart
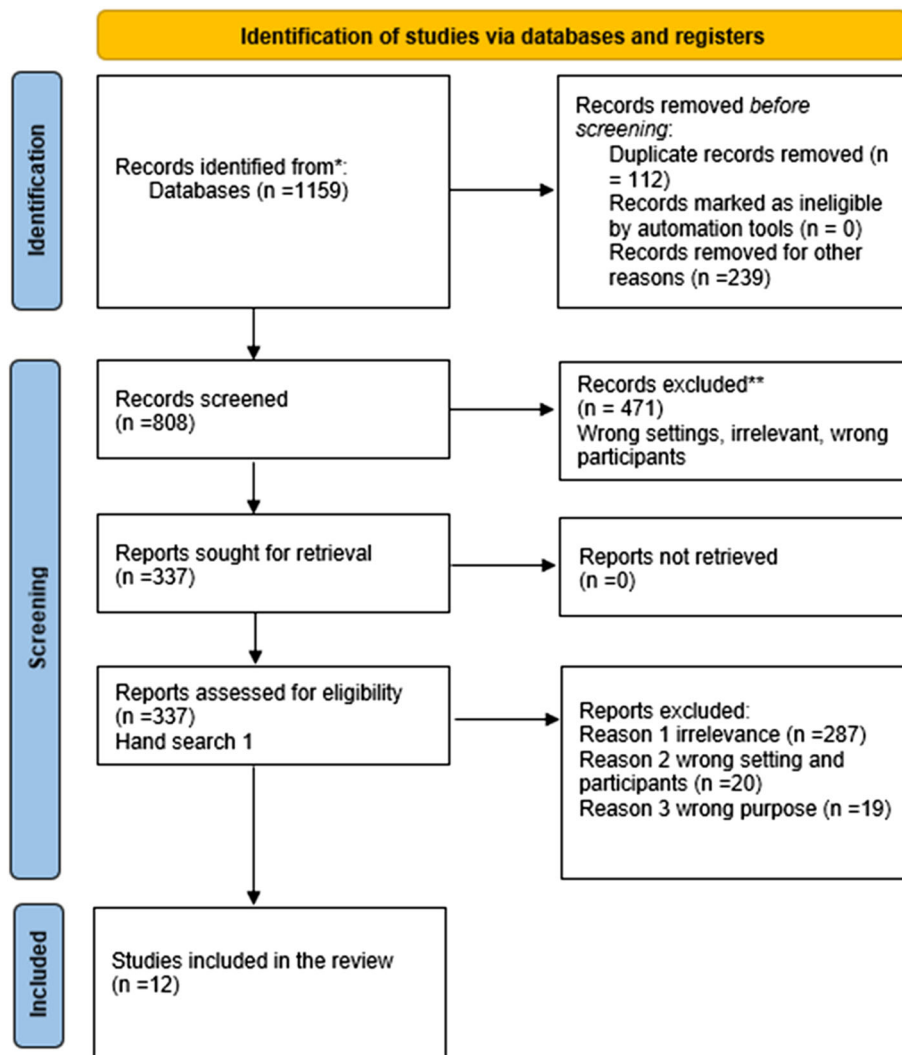
et al., 2021; Hung et al., 2014). In this literature review, some studies focused on the influences of personal factors on the transition experiences and retention of newly qualified nurses (Ho et al., 2021). Personal factors were mainly identified as the experience of belongingness, self-efficacy and self-confidence (Ho et al., 2021; Hung et al., 2014; Young et al., 2018).

4.1.1 | Perceived sense of belongingness and connectedness

A sense of belongingness in the work environment is an important element of the transition and retention of new nurses. Studies highlighted that these newly qualified nurses were trying to 'find a place' and 'fit in' to the workplace (Hazelton et al., 2011; Schwartz et al., 2011; Young et al., 2018). This involves the role of self, feeling connected with colleagues, and the personal environment (Ho et al., 2021). Ho et al. (2021) study on newly graduated Scottish nurses concluded by mentioning that transition experiences can directly impact retention by pointing out that 10 participants in this study either changed their jobs or were thinking of leaving nursing. A limitations of the above study was the time taken to collect data for this study (2 years) and some of the participants' experiences might have changed over that period. Hung et al. (2014) also highlighted that it is important to have a 'sense of belongingness' with colleagues and mental health settings. Additionally, a sense of belongingness contributed to the feeling of security and thereby smooth transition (Ho et al., 2021; Hung et al., 2014).

4.1.2 | Self-efficacy and understanding of self

The term self-efficacy is defined as the person's understanding and capacity to adapt behaviours to achieve goals (Bandura, 1997). Evidence suggests that there is a significant correlation between self-efficacy and retention (Pelletier et al., 2019). The above quantitative time-sequenced comparative study (Pelletier et al., 2019) of multiple groups of newly graduated mental health nurses used the Occupational coping self-efficacy instrument to measure a person's self-appraisals of capabilities to cope with environmental demands in

TABLE 1 Details of selected literature

Author(s) year of publication	Study design/aim	Setting/sample	Methods	Key findings that relate to the scoping review question/s
Karlowicz & Ternus, 2009 United States	Grounded theory/aim: to explore the work experiences of psychiatric-registered nurses (RNs) that influence retention within the first year of employment	N = 14 psychiatric nurses during the first year of employment with four psychiatric inpatient facilities	Interviews and case analysis	The new mental health nurses' issues involving education and training, team dynamics and organizational support converging to influence nurses' decisions to terminate employment within the first year (professional factors).
Hazelton et al., 2011 Australia	Participatory action research/aim: to evaluate a group mentorship programme for new graduate nurses working in an Australian public mental health service	N = 18 graduate nurses (within the first year of nursing) working in an Australian public mental health service	Group discussions, participatory observation	The new mental health nurses experienced difficulties in fitting into their work environments, neglectful and hostile treatment of patients, and the obstacles that hindered therapeutic skill acquisition (professional factors).
Schwartz et al., 2011 Canada	Qualitative study/aim: to explore the new nurses' experience of their role within interprofessional health care teams in a mental health organization.	N = 10 new nurses (within the first year of nursing) in a public mental health organization in Canada.	Semistructured interviews	The new mental health nurses found difficulties fitting into the new work environment. Establishing credibility and building trust were central to the new nurses' transition experiences. Interpersonal and organizational factors contributed to the transition (professional factors).
Wright et al., 2011 Canada	Qualitative study/aim: to identify the aspects of a successful integration experience into mental health nursing from the perspectives of new nurses.	N = 10 new mental health nurses (within 18 months of nursing) in a mental health setting in Canada.	Semistructured interviews	Results of this study stated that a quality relational connection between and among team members sustains the motivation to continue mental health nursing (personal and professional factors). A negative relational atmosphere sets the stage for new nurses to experience disillusionment and despair.
Hung et al., 2014 Taiwan	Qualitative study/aim: to understand the working experiences of new psychiatric nurses during their first year in a clinical setting.	N = 15 new psychiatric nurses in Taiwanese mental health services (within the first year of nursing)	Phenomenological approach semistructured interviews	The new mental health nurses experienced a lack of sense of security, challenges with learning the process of interaction with clients and families, learning an appropriate role in creating a therapeutic environment and belonging (personal and professional factors)

(Continues)

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TABLE 1 (Continued)

Author(s) year of publication	Study design/aim	Setting/sample	Methods	Key findings that relate to the scoping review question/s
Young et al., 2018 South Korea	Qualitative study/aim: to describe the clinical experience of adaptation of new nurses working in psychiatry	N = 10 new psychiatric nurses (within the first year of nursing) in hospital South Korea	Giorgi's phenomenological method. In-depth personal interviews	The new mental health nurses' experiences were themed as frustrations due to lack of nursing capacity, 'heavy workload', trying to find own place in the new workplace and developing own life (professional factors)
Mabala et al., 2019 South Africa	Qualitative descriptive design/aim: to explore and describe the adaptation process of newly qualified nurses working in public mental health facilities in South Africa.	N = 11 newly qualified nurses'(within 18 months of nursing) working at mental health facilities in South Africa	Unstructured individual interviews	Fear related to the mental health care environment; self-doubt upon meeting the expectations of the inter-professional team; ways to adjust to the challenges; and confidence as mental health care professionals (personal and professional factors)
Rahmani et al., 2019 Iran	Qualitative content analysis/aim: to examine the perception of the Iranian psychiatric nurses in psychiatric wards and their transition period.	N = 18 new Iranian psychiatric Nurses'(in the first year of mental health nursing) perception of transition in psychiatric wards	Unstructured interviews	The major themes in terms of transitioning were inadequate preparation, stress sense of self-awareness and adjusting to the new workplace (personal and professional factors).
Pelletier et al., 2019 United States	Quantitative time-sequenced comparative study Aim: to understand the effectiveness of a nurse residency programme in retaining new graduate nurses in a psychiatric–mental health setting	N = 34 new graduate nurses in a psychiatric–mental health setting (within two years of nursing)	Survey Quantitative time-sequenced comparative study	The study yielded a turnover rate of 11.7% in Year 1 (88.3% retention) and 2.9% in Year 2 (97.1% retention rate), which are lower than the reported turnover rates (17.5% and 33.5%, respectively). Significant correlations are stated with knowledge and skills, social support, organizational support, civility, coping self-efficacy, organizational and occupational commitment, person–organizational fit and burnout (personal and professional factors)
Kaihlanen et al., 2019 Finland	Quantitative This study aimed to examine the association between the final clinical practicum experience with transition experience and turnover intentions of newly graduated nurses	N = 712 Nurses graduated (within the first year of nursing) within the past 2 years	Survey with five subscales	The association between the clinical experience and turnover intentions ($\beta = 0.23$, $p = .002$) was partly mediated by the emotional distress and socio-developmental-role conflict and ambiguity ($\beta = 0.26$, $p < .001$) domains of the transition wand were associated with turnover intentions (personal and professional factors).

(Continues)

TABLE 1 (Continued)

Author(s) year of publication	Study design/aim	Setting/sample	Methods	Key findings that relate to the scoping review question/s
Cao et al., 2021 China	Quantitative This work aimed to examine the mediating role of transition shock on the relationships between resilience, social support, work environment and turnover intention in newly graduated nurses	N = 361 Chinese newly graduated nurses (in the first year of nursing)	Transition shock scale for newly graduated nurses Survey	The average levels of compassion satisfaction, burnout and traumatic stress in newly graduated nurses were 80.2%, 38.2% and 57.5%, respectively. Resilience, social support and work environment are directly related to transition shock and thereby retention (personal and professional factors)
Ho et al., 2021 United Kingdom	Aim: to explore how newly qualified nurses' work experiences are constructed through the interplay between self, workplace and home life influencing their retention	N = 46 (n = 12 new mental health nurses within 2 years of nursing)	Qualitative Semistructured interviews	'Transition shock', 'workplace factors' and 'work/life balance' have influenced the retention of nurses Eight participants had changed jobs or left, and two were looking to leave nursing (professional factors)

mental health settings. The results of this study indicated that 11.7% of new nurses left their position within the first year and 2.9% left the profession within the second year (Pelletier et al., 2019). Most respondents indicated that factors that contributed were job dissatisfaction, understaffed units, patient load and acuity of the work environment (Pelletier et al., 2019). On the other hand, another study highlighted that resilience has also played a role in the retention of nurses (Cao et al., 2021). This study, which explained the effects of resilience on turnover intention in newly graduated nurses (Cao et al., 2021), postulated resilience as a personal factor that influenced retention. Higher levels of resilience positively influenced the process of transition. This study also indicated that transition shock could also affect the intention to leave nursing.

Nurses' understanding of self was also highlighted as a contributing factor to retention however portrayed as another factor that positively impacts the process of transition (Rahmani et al., 2019). Besides, self-awareness also contributed to self-confidence in the work environment. Self-awareness is indicated as being aware of one's fears and anxiety while paying attention to the impacts of positive communication (Rahmani et al., 2019). To conclude, evidence asserts that positive experiences enhance a sense of belonging, self-efficacy and self-understanding contributing to a smooth transition and positive retention (Cao et al., 2021; Ho et al., 2021; Hung et al., 2014; Rahmani et al., 2019).

4.2 | Professional factors

There were a number of professional factors identified and are described below:

4.2.1 | Influence of workplace environment

Many studies have emphasized the importance of organizational support in the transition and retention of nurses during the initial years of practice (Kaihlanen et al., 2020; Karlowicz & Ternus, 2009; Schwartz et al., 2011). The organizational factors include supportive colleagues and the workplace culture. Several studies aimed to explore the influence of the work environment on the experiences of new nurses and identified teams' dynamics and collegiality have crucial roles to play in transition. Most of the studies were qualitative, and two were using mixed-method approaches (Cao et al., 2021; Kaihlanen et al., 2020; Schwartz et al., 2011; Wright et al., 2011; Karlowicz & Ternus, 2009;).

4.2.2 | Team dynamics and collegiality

The role of team members and their impact on transition is established in the literature (Wright et al., 2011). A qualitative study also analysed 10 semistructured interviews with new nurses and identified that the quality connection with the team members contributes to job satisfaction and transition (Wright et al., 2011). In congruent with the

above, Schwartz et al.'s (2011) study also brought forth similar findings. Schwartz et al.'s (2011) study reported that support from the colleagues and clinical team made the nurses confident which has contributed to job satisfaction and integration. This study also pointed out that the social connection with the team members reduces the stress and anxiety of new nurses. Likewise, Schwartz et al. (2011) found that collaborating with team members could promote safety in mental health settings. Similarly, a study (Mabala et al., 2019) on the experiences of new nurses in South Africa indicated the importance of positive interaction within the team and the value of learning from colleagues. The team support will also assist the nurses to overcome anxiety related to the new mental health work environment (Mabala et al., 2019). Likewise, Karlowicz and Ternus (2009) also asserted the importance of team dynamics. This grounded theory research interviewed 14 newly qualified nurses and spotlighted that team and organization support directly impacts the retention of nurses during the initial years of practice (Karlowicz & Ternus, 2009). Additionally, it is suggested that confusion and ambiguity of roles and responsibilities in the work environment can negatively impact transition (Karlowicz & Ternus, 2009). Integration into the existing team resulted in job satisfaction, role clarity within the team and improved retention (Karlowicz & Ternus, 2009; Mabala et al., 2019).

4.2.3 | Workplace culture

Evidence from available literature calls attention to the influence of workplace culture on transition experiences and retention of nurses during their initial years of practice (Hazelton et al., 2011; Ho et al., 2021; Wright et al., 2011). Australian action research on new graduate mental health nurses (Hazelton et al., 2011) also stated that workplace environment, role modelling and supportive colleagues can positively impact transition experiences. Participants revealed their negative experiences while fitting into the work environment. Significantly, unfamiliar work environment, routine, judgemental attitudes of colleagues, lack of cooperation of team members and lack of support from experienced mental health nurses were associated with an increase in a sense of confusion. Likewise, a recent study (Ho et al., 2021) also stated that workplace factors such as lack of team support, and poor team morale could impact the experiences of new nurses. Participants in this study pointed out that transition shock was contributed by a negative workplace environment and influenced retention. Significantly, Hazelton et al. (2011) and Ho et al. (2021) identified that professional factors such as orientation, supervision, professional development and training can positively influence transition and retention during initial years of practice.

4.2.4 | Mentorship and support

Hazelton et al. (2011) studied newly graduated mental health nurses in public mental health services and found that mentorship and clinical rotations ensured a variety of learning experiences. Similarly,

Karlowicz and Ternus (2009) also recommended that mentorship programmes for novice nurses assist in team-building and improve retention. A formal mentorship programme ensures mentors' support in orienting to the new workplace, developing professional skills (Hazelton et al., 2011) and increasing job satisfaction (Karlowicz & Ternus, 2009). Karlowicz and Ternus (2009) also identified that organizational support was inevitable, and lack of support contributed to the nurses' decision to leave. Mabala et al. (2019) studied newly graduated nurses working in public mental health and identified that providing patient care responsibilities and throwing to the deep end without proper support and orientation could increase stress and turnover. This was particularly so during the initial weeks of mental health nursing (Hazelton et al., 2011; Mabala et al., 2019). An Iranian study on mental health nurses' perception of transition in mental health wards (Rahmani et al., 2019) also added that training and professional development during the initial years of practice could positively change the transition experiences.

Another research highlighted the strongest correlations between social support during the initial years of mental health nursing including positive behaviours and reflective learning (Pelletier et al., 2019). This study identified teamwork, mentoring and support from nursing and non-nursing colleagues improved the new nurses' confidence in their knowledge and skills (Pelletier et al., 2019). The support provided for the new nurses made them confident in sharing their experiences with the team and reflective learning (Pelletier et al., 2019).

4.2.5 | Professional development

New nurses' transition and retention continue to remain challenging with various factors influencing the process. Professional development including transition programmes improves transition experiences and retention of nurses during the initial years of practice (Karlowicz & Ternus, 2009). Karlowicz and Ternus (2009), aimed to explore issues influencing psychiatric nurses' retention during the first year of practice. Participants of this study revealed factors including issues related to education and training, and lack of support had influenced their decision to leave within a year of practice. Another phenomenological study on graduate nurses from Taiwan (Hung et al., 2014) also reported that professional development including learning core competencies and the process of interaction with clients and families was important during the first year. Professional development including transition programmes and pre-entry programmes indicated as an important point in the career before the transition to a nursing speciality (Karlowicz & Ternus, 2009).

5 | DISCUSSION

This review aimed to identify the factors influencing the transition and retention of mental health nurses during the initial years of practice. Our findings indicated a paucity of research focusing specifically on factors influencing the transition and retention of mental health nurses during

the initial years of practice. Two major factors with subfactors were elicited and were personal factors and professional factors that influenced the transition and retention of new mental health nurses. Personal factors such as self-confidence and self-efficacy were important attributes new nurses must possess during the initial years of their practice to remain in their field of choice. However, to develop these attributes, they must feel they belong in their working environment. Therefore, nurse managers and leaders need to develop and implement support strategies including mentoring and clinical supervision for these nurses. Mentoring and clinical supervision were identified as helpful tools for the health workforce, especially in mental health (Department of Health, 2018).

A study conducted by Kim and Shin (2020) examined the barriers and enablers for the transition of novice nurses in general nursing settings. The findings of the study indicated that self-efficacy and self-confidence were two significant personal factors influencing successful transition. Fears, over expectations, and emotional issues were highlighted as barriers to effective transition (Chiao et al., 2021; Cleary et al., 2009; Kim & Shin, 2020). The feeling of being accepted, respected and included in the workplace environment connected novice nurses with the workplace and therefore increased the chance for successful retention (Chamberlain et al., 2019; Guo et al., 2019). Chamberlain et al. (2019) asserted that 'the sense of belonging was vital to retention' (p. 9). These insights may guide nurse managers and leaders when involved in developing support guidelines for the successful transition experience in mental health settings. Many early career mental health nurses described that their self-confidence increased within the first 6 months and was fastened when they felt supported (Ho et al., 2021; Hung et al., 2014). Adequate orientation, ongoing support and respect for novice nurses are essential in all their transition phases to build confidence. This highlights the need for a robust orientation and support plan for early career mental health nurses and is concurrent with the findings of this review.

Many nurses from various studies identified that team dynamics, collegiality and workplace culture had a crucial influence on the retention of novice nurses (Chamberlain et al., 2019; Hooper et al., 2016; Kim & Shin, 2020). An integrated review conducted by Hooper et al. (2016) highlighted that mental health graduates were highly likely to remain in the field when they were adequately supported and had positive experiences during their graduate year. The above findings are concurrent with the findings of this review, for example, team dynamics and the camaraderie of the team (Mabala et al., 2019) had significant roles in their transition experience as they felt part of the team. Moreover, social connection decreased their anxiety and stress and promoted a sense of safety, especially for those working in mental health settings (Schwartz et al., 2011). To summarize, although retention of early career mental health nurses is a known priority globally and in Australia (Government of Australia, 2020; Hayes et al., 2012; Mills et al., 2016), this review identified that there is a gap in research addressing this specific issue. Additionally, another aim of the review was to identify evidence-based strategies for effective transition and retention. This was not completely achieved due to insufficient evidence from the existing literature.

6 | LIMITATIONS OF THE REVIEW

We acknowledge that there might be a few limitations to this review due to the lack of formal quality assessment of selected studies and the likelihood of missing related literature due to the exclusion of grey literature. Most of the studies included in this review were completed before the COVID-19 pandemic. During the pandemic, early career nurses experienced the stress of working in an unfamiliar environment and modified ways of working due to staff shortages and pandemic-related restrictions. This situation might have impacted the experiences of early career nurses, which are not identified in this review.

7 | CONCLUSION

This literature review highlighted several personal and professional factors that influence the transition and retention of mental health nurses during the early years of their practice. It has also indicated that a positive transition experience can contribute to the retention of nurses. However, there is a gap in the literature addressing effective strategies for positive transition experiences for early career nurses. Hence, future research is recommended to explore this area, especially during the initial years of mental health nursing career.

8 | IMPLICATIONS FOR NURSING MANAGEMENT

Potential benefits of effective transition and support with the understanding of factors influencing transition and retention of early career mental health nurses will enhance staff morale, sustainability of the workforce and better patient outcomes. This review also has the potential of informing the organization and clinical leadership of factors influencing retention. This includes the importance of a supportive and collaborative work environment, especially during the initial years of nursing practice.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest.

ETHICS STATEMENT

No ethics approval was sought as this is a literature review paper.

DATA AVAILABILITY STATEMENT

Research data are not shared.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

ORIGINAL ARTICLE

WILEY

Organizational citizenship behaviour as a protective factor against the occurrence of adverse nursing-sensitive outcomes: A multilevel investigation

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Abstract

Aims: This study aimed to investigate the association between organizational citizenship behaviour enacted by nurses and the occurrence of adverse nursing-sensitive patient outcomes.

Background: Managing psychosocial factors (i.e., aspects concerning the work environment) is key to ensure patient safety, to prevent exacerbation of case complexity and to cope with critical shortages in human and financial resources.

Methods: Self-report measures of nurses' organizational citizenship behaviour were combined with objective data on the incidence of adverse nursing-sensitive outcomes (i.e., pressure ulcers and restraint use) collected through patients' medical records. Participants were 11,345 patients and 1346 nurses across 52 teams working in 14 Italian hospitals. Data were analysed using multilevel binary logistic regression models.

Results: A negative relationship between nurses' organizational citizenship behaviour and restraint use was identified, with an odds ratio of 0.11. Thus, for a one-unit higher organizational citizenship behaviour score, the odds of using restraints shrink to about one eighth of the previous level.

Conclusions: Intervention strategies to foster the implementation of organizational citizenship behaviour among nurses may inhibit the occurrence of critical outcomes affecting patients' health and well-being (i.e., using restraint devices).

Implications for Nursing Management: In health care organizations, shaping a psychosocial environment encouraging organizational citizenship behaviour can mitigate the occurrence of adverse nursing-sensitive outcomes such as restraint use on patients.

KEYWORDS
health care, nursing-sensitive outcome, organizational citizenship behaviour, quality of care, work environment

1 | BACKGROUND

During the last decades, several changes have occurred in the Italian health care system, with a significant reduction in financial resources and hospitals facing considerable nurse shortages. This scenario is in line with a worldwide trend (Aluttis et al., 2014). These substantial changes are combined with the increased complexity of cases, with older patients reporting multiple pathologies. Hence, the requirement to deliver high-quality care that ensures patient health and minimizes costs has become a critical challenge for the health care system. This challenge is particularly pertinent for nurses, the largest group of employees within the hospital setting and are responsible for delivering most of the patient care (Purdy et al., 2010). This became dramatically clear over the last 3 years as the global health system grappled with the Covid-19 pandemic (Fernandez et al., 2020). Traumatic experiences and prolonged stress responses among nurses, who were on the frontlines of emergency management, are going to affect their health for a long time to come (Carmassi et al., 2022).

As a consequence, research has progressively focused on the psychosocial work-related factors (i.e., aspects concerning the work environment), which have the potential to maximize nurses' provision of the best care (Dutra & Guirardello, 2021).

The quality of care provided by nurses is a key antecedent of patient outcomes, such as patient safety and satisfaction (Jarrar et al., 2019). As a result, there has been an increased interest in identifying specific indicators of nursing care quality, the so-called adverse nursing-sensitive outcomes (NSOs). These outcomes are characterized by two primary features: They are relevant, based on nurses' scope and domain of practice, and they are linked to nursing inputs and interventions, on the basis of empirical evidence (Doran, 2003).

Ausserhofer et al. (2013) tested a model of nursing care left undone as part of the RN4CAST project based a sample of 33,659 nurses working for 488 EU hospitals. According to this model, the quality of care provided is influenced by patient factors (e.g., patients' care needs) and activities involved in the patient-to-nurse interface of care process (e.g., direct physical care and monitoring). In line with this theoretical framework, the present study aims to assess how the prevalence of adverse NSOs is affected by patient characteristics (e.g., age, gender and health status) and a specific category of work behaviour enacted by nurses during the care process, that is, organizational citizenship behaviour (OCB).

The adoption of a conduct especially devoted to patients' care may be hypothesized to inhibit the prevalence of NSOs. This assumption is consistent with theoretical perspective suggesting that OCB provides valuable advantages to organizations across different sectors including health care, particularly through the enhancement of organizational effectiveness and, consequently, resulting in higher levels of patient satisfaction (Chahal & Mehta, 2011), but also their health and well-being (Ng et al., 2021). To be specific, empirical evidence indicates that nurses willing to engage fully in clinical work through extra-role behaviour contributing to organizational goals attainment are critical for providing high-quality and safe patient care (Feather et al., 2018; Gou et al., 2021). This relationship could be explained through the adoption of discretionary behaviour among nurses that may enhance patient-oriented behaviour, thus inhibiting the prevalence of adverse NSOs.

Patient-oriented behaviour can be captured under the broader category of OCB, describing all those actions that go beyond prescribed job requirements but, at the same time, may concur to significantly enhance the organizational functioning (Organ et al., 2006) and result in improved social relationships and effectiveness at the individual, group and organizational levels (Podsakoff et al., 2014). Evidence confirms the positive link between nurses' OCB and their performance (Gunawan et al., 2020), sense of empathy (Noh & Yoo, 2016) and levels of family-centred care (Mahooti et al., 2018).

OCB integrates elements such as altruism, courtesy and conscientiousness, which are vital drivers underlying the required high-quality care for fewer adverse NSOs occurrence. Nurse caring behaviours significantly predict activities such as regular changing of patients' positioning in bed, skincare and adequate patient surveillance, which are also the most frequently missed care tasks among nurses (Labrague et al., 2020). Hence, the current study assumes that OCB could be related to the incidence of adverse outcomes that are highly influenced by the approach adopted in performing patient care tasks. In doing so, this research aims to enlarge previous results revealing that the adoption of discretionary behaviour (i.e., OCB) among nurses may result in enhanced patient-oriented behaviour.

Although previous research explored the association between organizational factors and measures of nurses' well-being, on the one hand, and indicators of the quality of care provided (Van Bogaert et al., 2010), the current study was an earlier attempt to investigate this relationship though the implementation of multilevel modelling combined with objective data. Rather than assessing the quality of care using a self-report measured filled out by nurses, the current study was based on the actual incidence of pressure ulcers and restraint use, as they were recorded in patients' medical records.

In particular, we considered two adverse NSOs with a prominent role in the international nursing literature (Doran et al., 2011): pressure ulcers and restraint use. Pressure ulcers, commonly known as bedsores, are defined as a localized injury to the skin and/or underlying tissue, usually situated over a bony prominence, and caused by pressure, or pressure combined with shear (Kottner et al., 2020). Although clinical knowledge of pressure ulcers is consistently credited with playing a key role, a major predictor in the prevention of this specific NSO lies in the proactive and caring attitude of nurses, also when they have limited training on the subject (Demarré et al., 2012). In

other words, the incidence of pressure ulcers is significantly influenced by activities concerning the constant monitoring of patients' skin health and the quality of care provided to patients (Kalisch et al., 2014).

Building on the theoretical framework and research findings illustrated here, we developed the first hypothesis as follows:

> **Hypothesis 1.** Higher levels of OCB by nurses are associated with fewer pressure ulcers among patients treated by those nurses.

Restraint use has been shown to be driven by nurses' affect (e.g., emotions and negative attitudes), rather than knowledge. The experience of negative affect, in turn, is strongly influenced by the perception of the surrounding environment (Walker et al., 2018). This evidence emphasizes the need to further investigate psychosocial work-related factors (i.e., aspects concerning the work environment), which have the potential to influence nurses' behavioural choices. The use of physical restraint entails the application of any manual method, as well as a physical or mechanical device, material or equipment aimed at immobilizing or limiting the patient's capability to move his/her arms, legs, body or head freely (Centers for Medicare and Medicaid Services, 2006). The most commonly used physical restraints include, for instance, straps/belts, bilateral bedrails, vests, wheelchair, limb or waist ties, and mittens. The employment of physical restraints has drawn particular attention in the scientific community, due to its potentially harmful consequences, such as the reduction in bone density, muscle atrophy, infections, incontinence and even death (Bellenger et al., 2018). The magnitude of adverse consequences that can be associated with using physical restraints has led institutions to introduce rigorous guidelines limiting their use to the minimum practicable extent (George, 2020). Earlier research identified empathy as a core predictor of nursing attitudes and behaviours able to prevent the occurrence of restraint use (Yıldırım Üşenmez & Gümüş, 2021). Generally speaking, empathy refers to the ability to understand others' experiences vicariously and identifies it as a crucial component of human adaptive social functioning (Davis, 2017). As empathy is a crucial driver compelling people to engage in prosocial behaviours to benefit others (Hafenbrack et al., 2020), we could expect that enacting OCB would prevent the occurrence of adverse NSOs. Based on this theoretical reasoning and the previous findings, we made the following prediction:

> **Hypothesis 2.** Higher levels of OCB by nurses are associated with lower use of restraints on patients treated by them.

2 | METHODS

Objective data on patients' socio-demographic data, health status and the incidence of adverse NSOs were collected by accessing medical records reported in the regional database of the hospital discharge forms. Nurses working in these hospitals were asked to voluntarily fill out an anonymous paper-and-pencil questionnaire that subsequently was stored in ballot boxes that were provided in each health care structure involved. The final sample consisted of 11,345 patients and 1346 nurses working in 52 teams across 14 Italian general hospitals, with a mean of 218.2 patients and 25.9 nurses per team.

2.1 | Nurses' characteristics

With reference to the branches of medicine involved, 22.7% worked in the *intensive care* ward ($N = 305$), 21.8% in the *orthopaedics* ward ($N = 293$), 18.4% in the *general medical practice* ward ($N = 248$), 15% in the *long-term* ward ($N = 202$ nurses), 11.1% in the *recovery and rehabilitation* ward ($N = 150$) and 11% in the *geriatric* ward ($N = 148$).

Most of them were women (81.6%) and had a permanent employment contract (88.5%). Concerning their age, 18% of nurses participating in this study were younger than 30 years old, 33.3% were between 31 and 40 years of age, 37.2% were between 41 and 50 years and 11.5% were above 50 years. On average, participants' job tenure was 14.74 years ($SD = 9.26$), and they had worked in their current hospital ward for 9.85 years ($SD = 7.98$).

2.2 | Patients' characteristics

Among patients, 30.7% of them were hospitalized in the *orthopaedics* ward ($N = 3481$), 25.6% in the *general medical practice* ward ($N = 2909$), 17.4% in the *geriatric* ward ($N = 1973$), 14% in *long-term* ward ($N = 1590$), 9.5% in the *intensive care* ward and 2.7% in *recovery and rehabilitation* ward ($N = 310$). The slight majority of patients were women (53.2%), and the mean age was 72.88 years ($SD = 17.12$). In addition, the average length of hospitalization in the current sample was 10.1 days ($SD = 9.03$).

2.3 | Measures

2.3.1 | Patients' data

Pressure ulcers and restraint use

The incidence of the two types of adverse NSOs under investigation was measured as a dichotomous variable (1 = *yes*; 0 = *no*) as reported in the patients' medical records. Regarding pressure ulcers, the current study includes all four stages of wound severity. Moreover, restraint use here refers to the employment of any device among bed rails, wheelchair with table, wrist restraints or lap belt for at least 1 day of their hospitalization.

Age

The first variable included at the individual level as a factor potentially associated with the incidence of adverse NSOs was patients' age.

Health status

The Charlson comorbidity index was included as a general indicator of patients' ill health because it represents the most popular comorbidity index (Charlson et al., [1987]). This index ranges from 0 to 12 and is aimed at predicting 1-year mortality, based on 15 medical conditions: heart failure, cerebrovascular disease, active cancer, diabetes, chronic obstructive pulmonary disease, chronic kidney disease, dementia, peripheral vascular disease, diabetes with complications, acute myocardial infarction, cirrhosis, previous myocardial infarction, ulcer, liver disease and hypertension. Each condition was weighted according to their potential influence on mortality.

2.3.2 | Nurses' level

OCB

OCB was assessed with the three-item extra-role behaviour subscale taken from the questionnaire developed by Perrone and Chiacchierini ([1999]). Items were slightly adapted to the hospital context (i.e., the term 'organization' was replaced by 'hospital'). Sample items are as follows: 'I carry out tasks that, although not expressly required, may help the image of my hospital' and 'I make suggestions in order to improve my hospital'. These items were scored on a 7-point scale ranging from 1 (*totally false*) to 7 (*totally true*). The internal consistency of this scale was $\alpha = .74$.

2.4 | Strategy of analysis

OCB data from nurses were aggregated to the team level in order to be matched with patient data. Before aggregation, intraclass correlations were calculated to determine whether this was justified statistically: $ICC_{[1]}$ was 0.04, and $ICC_{[2]}$. The $ICC_{[1]}$ value indicates that 4% of the variation in OCB can be accounted for by team membership, and it is slightly lower than the threshold of 05 for $ICC_{[1]}$ (LeBreton & Senter, [2008]). On the other hand, $ICC_{[2]}$, representing the reliability of between-group differences, reported a value equal to 0.47. This therefore exceeds the criterion value of 0.40 given by Glick ([1985]), and these indices support data aggregation (Bliese, [2000]).

As both outcomes (pressure ulcers and restraint use) are binary, and patients were grouped within nurses, we used multilevel binary logistic regression to test the hypotheses. The analysis controlled for patients' age, sex and health status (measured by the Charlson comorbidity index), by including these as covariates within the models. Analysis was conducted with the statistical software SPSS (Version 26), using the 'genlmixed' procedure.

TABLE 1 Summary statistics for all variables used in analyses

Pressure ulcers (% yes)	17%
Restraint use (% yes)	40%
Patient gender (% male)	47%
Patient age (range = 18–107)	72.9 (17.1)
Nurses' organizational citizenship behaviour[a] (range = 1–7)	3.38 (0.41)
Charlson comorbidity index[b] (range = 0–12)	1 (0–3)

[a]Mean (standard deviation).
[b]Median (interquartile range).

3 | RESULTS

In total, there were data on 11,345 patients treated by 52 nursing teams, giving a mean of 218.2 patients per team (this ranged from 5 to 641). Table 1 shows summary statistics for all variables used in the analysis. It can be seen that overall, 17% of patients had pressure ulcers, and restraints had been used in 40% of cases.

Tables 2 and 3 show the results of the multilevel binary logistic regression models used to test Hypotheses 1 and 2, respectively. For the model predicting pressure ulcers, the effect of nurses' OCB was not statistically significant: The odds ratio (OR) estimate of 0.73 (95% confidence interval [CI]: 0.46–1.15) suggests that any effect there may be is not large, and there is no sufficient evidence to support Hypothesis 1.

For the model predicting restraint use, however, there was a statistically significant relationship between nurses' OCB and the use of restraints. Specifically, the model gives an OR of 0.11 (95% CI: 0.02–0.52), indicating that for a one-unit higher OCB score, the odds of using restraints shrink to about one eighth of the previous level. This is a substantial change, so it makes sense to consider a one standard deviation change in OCB (0.41); a change of this level is associated with a reduction in odds of around 59% (95% CI: 24–78%) of using restraints. Therefore, Hypothesis 2 is supported.

4 | DISCUSSION

In order to contribute to the available literature concerning the occurrence of NSOs, the present study aimed to examine the relationship between OCB of nurses within specific patient care units and the occurrence of pressure ulcers and restraint use on individual patients cared for on these units. In doing so, a strength of the current study included the use of a multilevel approach to analysis and the use of multiple data sources to reduce common method variance. Using multiple measures (i.e., self-report questionnaires and objective data from medical records) from different sources (i.e., nurses and patients) is essential to overcome the limitations related to each data source (Ingersoll et al., [2000]). Objective measures can be considered as an assessment of nursing quality that is free of bias and prejudice (Stalpers et al., [2016]). Thus, the collection of objective data is

TABLE 2   Results of multilevel binary logistic regression predicting pressure ulcers

	B (95% CI)	Odds ratio (95% CI)	p
Intercept	−3.54 (−5.08, −2.00)	0.03 (0.01, 0.14)	.000
Patient age	0.04 (0.03, 0.04)	1.04 (1.03, 1.04)	.000
Patient gender (male)	−0.21 (−0.32, −0.10)	0.81 (0.73, 0.91)	.000
Charlson comorbidity index	0.12 (0.09, 0.15)	1.12 (1.09, 1.16)	.000
Nurses' organizational citizenship behaviour	−0.31 (−0.77, 0.14)	0.73 (0.46, 1.15)	.173

Abbreviation: CI, confidence interval.

TABLE 3   Results of multilevel binary logistic regression predicting restraint use

	B (95% CI)	Odds ratio (95% CI)	p
Intercept	3.42 (−1.76, 8.60)	30.57 (0.17, 5434.67)	.196
Patient age	0.05 (0.04, 0.05)	1.05 (1.05, 1.05)	.000
Patient gender (male)	−0.39 (−0.50, −0.29)	0.67 (0.60, 0.75)	.000
Charlson comorbidity index	0.13 (0.09, 0.16)	1.13 (1.10, 1.17)	.000
Nurses' organizational citizenship behaviour	−2.18 (−3.70, −0.66)	0.11 (0.02, 0.52)	.005

Abbreviation: CI, confidence interval.

recognized by several scholars as a mean for the systematic assessment of adverse NSOs (e.g., Veldhuizen et al., 2021).

In line with previous research (Chou et al., 2020; Neziraj et al., 2021), age, gender and health status were significantly associated with the prevalence of pressure ulcers and the employment of physical restraint.

Although different patterns of findings regarding the links between the prevalence of pressure ulcers and demographic variables are reported in the literature, numerous studies discuss and consider age and gender as potential critical determinants.

Few studies report no significant links between age and gender and pressure ulcers (e.g., Gallagher et al., 2008; Krause & Broderick, 2004). Charalambous et al. (2018) criticize Waterlow Pressure Ulcer Risk Assessment Scale for including gender and age as risk factors for pressure ulcers. Similarly, although Lichterfeld-Kottner et al. (2020) report a higher risk for women, they suggest that gender should not be considered as an independent risk factor for pressure ulcer development.

Findings are more consistent regarding the positive association between older age and the occurrence of pressure ulcers, whereas studies vary in reporting male or female gender as a positive predictor. For instance, although Lindgren et al. (2005) and Artico et al. (2018) indicate female gender and older age as significant predictors of the prevalence of pressure ulcers, Cremasco et al. (2013) report that pressure ulcer development is five times more likely for males compared to female patients. In a similar vein, recent studies (Kayser et al., 2019) support that male and older patients are at higher risk for developing pressure ulcers.

Similar to older age, extant findings depict a more consistent picture of the positive association between ill health status and the prevalence of pressure ulcers. Patients with ill health status and higher illness severity develop higher levels of pressure ulcers (Cremasco et al., 2013; Lindgren et al., 2005). Other health indicators (e.g., lower haemoglobin level) and old age are reported as significant predictors of pressure ulcers (Williams et al., 2000). Similarly, a cohort study revealed that health status (e.g., diastolic blood pressure and temperature) and age are significant predictors for pressure ulcers (Bergstrom & Braden, 1992). Moreover, patients' beliefs about their health and age at onset were positively related to self-reported pressure ulcer occurrence (Garber et al., 2000).

Some studies report increased risk for restraint use for males but no evidence for the effects of age (e.g., Zhang et al., 2021), whereas other researchers report a significant association with age but not for gender (e.g., Migon et al., 2008). Nonetheless, the links between the employment of physical restraint and age, gender and health status are more agreed upon compared to the prevalence of pressure ulcers. Numerous studies demonstrate that male gender and young age together with health status are significant predictors of physical restraint duration (Knutzen et al., 2013; Smithard & Randhawa, 2022; Välimäki et al., 2022; Zhu et al., 2014). These results are in line with the current findings, with the only exception of gender. Indeed, in the current sample, women report a higher risk of developing pressure ulcers or restraint use. Moreover, several studies report that indicators of health status (e.g., unconsciousness, disorientation, psychiatric disorders and physical health) are significantly related to the employment of physical restraints (Engberg et al., 2008).

Although the results currently available are rather inconsistent, the present study corroborates the assumption that patients' characteristics should always be considered in studies concerning adverse NSOs, even if the main focus is to investigate their relationship with nursing procedures and practices.

The present results provided support to the hypothesis of a negative relationship between OCB among nurses and the use of restraints

on patients. This finding aligns with the evidence that nurses' OCB creates a higher commitment to satisfy patients' needs and positively relates to service quality and patient satisfaction (Kaihatu & Djati, 2016).

One possible explanation regarding restraint use is the emotion and empathy-driven nature of OCB. OCBs are emotion centred and associated with empathy (Nguyen et al., 2019). When controlling for external factors (e.g., staffing and shifts), empathy levels of nurses are significantly related with lower levels of restraint use (Yang et al., 2014). Studies reporting adverse consequences of restraint use and suggesting that standard care is possible without restraints (Meyer et al., 2009) emphasize the efforts for reducing restraint use in health care facilities. Overall, our results support the assumption that nurses engaging in practices exceeding formal standards may be particularly attentive in providing high-quality care and, in turn, may decrease the frequency of restraint use.

A previous study on a sample of 29,477 patients (Thomann et al., 2021) reported a lower use of restraint measures associated with a greater availability of adequate guidelines regarding restraints (OR = 0.60, 95% CI [0.49–0.74]) and refresher courses for at least 80% of ward nursing staff (OR = 0.70, 95% CI [0.64–0.89]). The present findings, combined with existing results from the literature, highlight the need to provide health care staff with appropriate support and training opportunities in order to mitigate the need for restraint use.

In contrast to our hypothesis, the relationship between OCB and the occurrence of pressure ulcers was non-significant. A meta-analysis conducted by Liu et al. (2012) reported that diabetic patients had 2.15 times higher probabilities to develop surgery pressure ulcers (95% CI [1.62–2.84]). In a recent review on the diabetes risk factor in postoperative pressure ulcers (Nasiri et al., 2021), the authors indicated that patients with diabetes had 1.5 higher probabilities (95% CI [1.28–1.79]) to develop surgery-related ulcers than non-diabetic patients. A further review and meta-analysis (Avsar et al., 2020) analysing the impact of repositioning techniques on the occurrence of pressure ulcers in at-risk adult patients indicated a 25% reduction in the odds of positioning ulcers (OR = 0.75, 95% CI [0.61–0.90]) in favour of more frequent repositioning. Moreover, the reviews reported that two studies regarding turning team (i.e., Harmon et al., 2016; Still et al., 2013) showed a 51% reduction of the odds of ulcers when a turning team is present (OR = 0.49, 95% CI [0.27–0.86]).

These empirical findings suggest that repositioning techniques constitute effective strategies for pressure ulcer prevention, in addition to efficient training of workforce (Borojeny et al., 2020), standardization of interventions, effective leadership and synergy of multidisciplinary teams (Sullivan & Schoelles, 2013). Risk assessment tools, medical devices for managing pressure relief and lack of staffing can act as barriers for transferring nurses' knowledge to effective management of pressure ulcers (Mwebaza et al., 2014). Although nurses play a fundamental role by constantly monitoring those risk factors that predispose patients to suffer from this negative outcome (Choi et al., 2020), the management of pressure ulcers involves a multifaceted structure, including teamwork, communication, available material resources (Kalisch et al., 2014) and macrovariables such as nurse staffing levels (Blume et al., 2021; Kim & Bae, 2018).

4.1 | Strengths and limitations

A major strength of the current study is the inclusion of objective data on the occurrence of adverse NSOs (i.e., pressure ulcers and restraint use) to overcome the limitations of self-report research. Furthermore, the sample size added further robustness to the reliability of the obtained results, with 52 teams involving 1346 nurses and 11,345 patients. These data allowed us to perform a first attempt to test a multilevel model of adverse NSOs.

Along with its strengths, the current study also has some limitations that should be acknowledged. First, the study was limited to the investigation of pressure ulcers and restraint use. A direction for future research would be to include additional common nursing-sensitive patient outcomes (e.g., patients' falls, hospital-acquired infections and pneumonia) when evaluating the impact of OCB. An additional limitation of this study entails measuring nurses' OCB with a three-item scale. Nevertheless, this scale has been widely used in previous studies in the Italian context (e.g., Argentero et al., 2008; Simbula & Guglielmi, 2013) and reported an internal reliability coefficient exceeding the minimum threshold of 0.70 (Cortina, 1993). Furthermore, our findings were based exclusively on a sample of Italian nurses and patients. Thus, future research is needed to test whether the same results can be replicated in other countries.

5 | CONCLUSIONS

The current study contributes knowledge about the antecedents of adverse NSOs and addressing the understudied concept of OCB using multilevel modelling and multisource objective data. The relationship between nurses' OCB and adverse NSOs has been poorly explored, especially using objective indicators of these outcomes. Using a multilevel model, the negative association between OCB and frequency of restraint use was empirically supported. These findings confirm that nurses' implementation of OCBs beyond prescribed work requirements may reduce adverse nursing-sensitive patient outcomes that are associated with burdens in terms of both patient health and financial costs. Overall, the current research contributed to the extension of the current knowledge of the potential role played by nurses' well-being in buffering the occurrence of outcomes that have shown to be highly onerous not only as regards patients' health and well-being but also in terms of financial cost. Given the current scenario in the global health care system, characterized by critical shortages in human and financial resources allocated to public hospitals, a strategic tool lies in a deeper understanding of nurses' behaviour that should be enhanced to inhibit the occurrence of these harmful outcomes.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

For more than one decade, nursing resources in European public health care systems have been reduced due to the economic recession, whereas hospitals were shifting from acute to intensive care settings. In the context of nursing shortage and financial issue, recurrent changes in care models, work environments' characteristics and organizational approaches are factors influencing intensification of care and care rationing (Blackman et al., 2018).

In a context of structural understaffing, nurse managers play a pivotal role in exercising best leadership practices in designing and implementing plans to improve the work environments to maximize OCB. Although it is important that nurses retain a sense that going above and beyond their formal job role is a choice and not a demand, nurse managers and supervisors may subtly encourage behaviour contributing significantly to the organizational functioning. Promotion of OCB among nurses requires a multifaceted structure integrating, but not limited to, effective leadership style and human resources (HR) practices fostering professional competencies, organizational justice, trust, commitment and motivating job designs.

Developmental HR practices (e.g., training and development) play an essential role in promoting OCB among nurses (Eisenberg et al., 2018). In particular, nurses' perception regarding the developmental HR functions in the organization may positively affect their levels of OCB (Pohl et al., 2019). Organizations should enhance the required HR structure and facilitate effective communication to signal an effort and intention to value and support the growth and professional development needs of nurses. Thus, leaders should invest in satisfaction from developmental HR activities, which in turn will enhance perceived organizational support and foster OCB, loyalty and organizational citizenship participation (Pohl et al., 2019). Similarly, a study addressing academic nursing staff (Alim & El-Sayed, 2017) reports that training and development opportunities and work–life policies favouring flexibility and effective integration of work and family domains facilitate organizational citizenship.

Academic literature consistently identifies job satisfaction and work engagement as critical antecedents of OCB among health care professionals (Ng et al., 2021). Empirical evidence indicates that supporting the professional competency of nurses promotes their job satisfaction and OCB (Biagioli et al., 2018). Additionally, organizational efforts to build up emotional intelligence among employees and managers are crucial to enhance nurses' OCB.

Moreover, designing more intrinsically motivating jobs through higher autonomy, skill variety, feedback and task identity and significance (Oldham & Hackman, 2010) is another key to promoting OCB among nurses (Pohl et al., 2013). Investing in effective task designs and managerial styles that empower more meaning, task variety and flexibility in health care organizations can elevate OCB among nurses.

Effective leadership is a further critical pillar for OCB promotion in health care organizations. For instance, spiritual leadership can foster OCB among health care professionals through increased quality of work life and ethical behaviour (Pio & Lengkong, 2020). In a similar vein, ethical leadership fosters OCB among nurses through enhanced trust and psychological well-being (Huang et al., 2021). Transformational leadership mediates the association between organizational justice and OCB, and health care organizations and leaders investing in fairness and equity regarding the allocation of rewards, promotions and assessment processes can promote higher levels of OCB among nurses (Metwally et al., 2018). Leaders and organizations should invest in nurses' professional commitment as they contribute to nurses' OCB with a strong explaining power (Duarte, 2015).

ETHICAL CONSIDERATIONS

Data collection was conducted by the Observatory for Healthcare Safety in all the hospitals of the Emilia-Romagna Region (Italy). The overall aim was to monitor phenomena regarding patient safety in agreement with Italy's National Health Plan (PSN 2011–2013, paragraph 3.3.1). Therefore, the Observatory for Healthcare Safety was set up with the purpose to identify the risks in each hospital and improve the quality of care. The present study was approved by the ethics committees of all the hospitals that accepted to take part in this study, and informed consent was obtained from all the patients.

CONFLICTS OF INTEREST
None.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ORIGINAL ARTICLE

WILEY

Delphi survey on the application of advanced practice nursing competencies: Strong points and unfinished business in cancer care

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Abstract

Aim: This study assessed the application of advanced practice nursing competencies in cancer care to identify obstacles to their full implementation.

Background: Internationally, the implementation of advanced practice nursing roles depends on the context and environment, which shape the definition, scope and competencies associated with these roles.

Methods: Nurses participated in two rounds of an online Delphi survey about the competencies of advanced practice oncology nurses. The threshold for expert consensus was set at 75%.

Results: Eleven competency domains were proposed; all yielded consensus of over 75%. However, for 57.8% of the specific competencies proposed in round 1 and for 62.2% in round 2, there was no consensus on which were applied in practice. There was more agreement on the competencies applied in the domains of direct clinical practice, consultation and collaboration and interprofessional relations than in dimensions such as health care promotion, quality improvement, evidence-based practice and research. Barriers related to unimplemented competencies were identified.

Conclusions: The competencies applied in advanced practice nursing reflect incomplete development of these roles. Domains related to direct clinical practice, consultation and collaboration and interprofessional relations are relatively well developed, whereas those related to leadership, research, evidence-based practice and quality improvement are not. The identified barriers hindering implementation of some competencies can inform strategies to develop this role in cancer care.

Implications for Nursing Management: Hospital administrators and nurse managers should reflect and be mindful of the development of advanced practice nurse (APN) competencies along with the challenges associated with implementing advanced practice roles.

1 | BACKGROUND

The professional role of the advanced practice nurse (APN) has emerged as an innovative solution to health care needs, providing a high degree of knowledge, expertise and autonomy in patient care (Hutchinson et al., 2014; Krishnasamy et al., 2021; Sánchez-Gómez et al., 2019). At the international level, implementation and regulation are uneven: in some countries, these roles have been established for decades, while in others, implementation has not yet reached its optimal level (Carney, 2016; Schönenberger et al., 2020; Westman et al., 2019).

Nurses are well placed to contribute to reducing the burden of cancer across the entire care pathway (Yates et al., 2021). Oncology APNs have the skills to respond to patients' needs at different stages of the disease. Through their functional roles as expert clinicians and researchers, APNs support evidence-based best practice within multidisciplinary teams (Baileys et al., 2018; Coombs et al., 2020), contributing to improvements in patients' quality of life and satisfaction as well as in clinical outcomes sensitive to nursing practice (Alessy et al., 2021; Cook et al., 2017; Keer et al., 2021).

In defining the concept and nature of advanced practice nursing, different authors have developed numerous theoretical approaches and models, including Hamric's Integrative Model of Advanced Practice Nursing (Hamric, 2014), Fenton's and Brykczynski's Expert Practice Domains of the Clinical Nurse Specialist and Nurse Practitioner and the Strong Memorial Hospital's Model of Advanced Practice Nursing (Spross, 2014).

Likewise, different scientific societies, such as the International Council of Nurses (ICN, 2020), the American Nurses Association (ANA, 2008), the Canadian Nurses Association (2019), the Royal College of Nursing (2018) and the Australian College of Nursing (Australian Nursing and Midwifery Accreditation Council, 2015) have developed specific competency frameworks and standards for advanced practice nursing. However, there is no global consensus on the definition of roles and nomenclature around this field. Rather, the APN's scope of practice is largely determined and conditioned by the environment in which they practice (Casey et al., 2019; Dowling et al., 2013; Jokiniemi et al., 2012).

Despite longstanding and other more recent experiences, the competencies associated with these roles and their level of implementation are diverse. Studies analysing APN competencies in different environments have observed more similarities than differences (Heinen et al., 2019; Hutchinson et al., 2014; Jean et al., 2019; Jokiniemi et al., 2021; Ryder et al., 2019). In general, these authors signal the need to develop specific instruments to evaluate APN competencies, to identify their roles in practice and to agree on the definition of competencies in order to enable quality assessment and compare different settings (Hutchinson et al., 2014; Jokiniemi et al., 2021; Sastre-Fullana et al., 2014).

Establishing a competency framework for APNs is crucial for ensuring that operational planning, education and professional development are optimal and in alignment with health system and patient needs (Dowling et al., 2013; Gardner et al., 2013; Jokiniemi et al., 2020). Studying the implementation of competencies in advanced practice roles and contexts can deepen our understanding of the role, define it more clearly, improve clinical outcomes and contribute to promoting nursing practice and the quality of nursing care (Jean et al., 2019; Jokiniemi et al., 2021; Sastre-Fullana et al., 2015). This aspect is relevant when crafting job descriptions, professional performance evaluations, clinical certification, and competency and education evaluation programmes (Burke et al., 2017; Sastre-Fullana et al., 2017).

Identifying advanced practice nursing and analysing its functions can inform an array of complementary processes, including APN recruitment and education (Gardner et al., 2016; Sevilla Guerra et al., 2021). The insight gained can also lay the foundation for developing health policies that integrate advanced practice nursing as a core asset to the health system, designing policies that set out the career paths available to these professionals and optimizing nursing resources (Jokiniemi et al., 2020; Sevilla Guerra et al., 2021).

On the other hand, Heale and Rieck Buckley (2015) emphasize the need to regulate advanced practice according to educational standards and certification, guaranteeing the full development of advanced practice and in turn ensuring good patient outcomes. In the field of oncology, the Oncology Nurse Society (Oncology Nursing Society (ONS), 2019), the Canadian Association of Nurses in Oncology (Canadian Association of Nurses in Oncology (CANO/ACIO), 2001) and the European Oncology Nursing Society (European Oncology Nursing Society (EONS), 2018) have published educational curricula, practice standards and nursing competencies according to the different professional roles performed. Oncology APNs are nested within multidisciplinary teams, and they specialize in cancer prevention and screening, genetic counselling, and case management. They also have a role in process coordination, teaching, guidance and surveillance, and they may also be the key nurse for symptoms management.

In Spain, advanced practice roles have been deployed under various names, such as case managers and clinical nurses in cancer or chronicity, and they adapt their practice to health system and patient needs (Lafuente-Robles et al., 2019; Sastre-Fullana et al., 2014). In Andalusia, the role of APNs in complex oncological processes has been recognized since 2018 (Junta de Andalucia, 2018), and in Catalonia, it is integrated into the most recent strategic lines and objectives of the Cancer Control Plan 2015–2020 (Pla Director d'Oncologia, 2015). Nevertheless, despite the implementation of advanced practice roles in Spain, the

functions performed by APNs are not regulated at a legal or professional level (Sevilla Guerra et al., 2018).

Studies in Spain have identified advanced practice roles and competencies, describing development that stops short of the full scope of practice (Gutiérrez Martí & Ferrús Estopà, 2019; Gutiérrez-Rodríguez et al., 2019; Sevilla Guerra et al., 2018). This situation increases the interest in exploring advanced practice from the perspective of the nurses who practice this role. Thus, the aim of this study was to elicit the perspective of oncology APNs on the level of implementation of the core competencies and the obstacles that hinder it, identifying areas of consensus through a Delphi survey.

2 | METHODS

2.1 | Study design

We applied the Delphi method to reach a consensus among experts through an iterative, two-round process with an expert panel (Keeney et al., 2011; McKenna & Keeney, 2008).

The process began with a proposed list of topics for discussion, obtained from a review to identify competencies of oncology APNs. The list of competencies was based on the competency models for advanced practice oncology nurses defined and published by the Oncology Nurse Society (ONS, 2019), the Canadian Association of Nurses in Oncology (CANO/ACIO, 2001) and the European Oncology Nursing Society (EONS, 2018). Hamric's Model of Advanced Nursing Practice was used as a theoretical framework (Hamric, 2014). A review of the domains and nursing competencies of advanced practice yielded an initial total of 90 competencies, organized under 11 competency domains: (1) direct clinical practice; (2) health promotion; (3) education; (4) consultation; (5) evidence-based practice; (6) clinical and professional leadership; (7) collaboration and interprofessional relations; (8) ethical decision-making; (9) quality improvement; (10) professional development; and (11) research.

2.2 | Panel of experts

Delphi participants comprise a panel of experts on the topic under study (Keeney et al., 2011; McKenna & Keeney, 2008). In our study, panel members were selected based on their expertise and/or experience in advanced practice nursing, ensuring that different perspectives were represented (Landeta, 2006). Both clinical and academic spheres were taken into consideration. The panel included (1) people with extensive knowledge of the application of advanced practice nursing due to their studies and research activity in the field; (2) directors and managers with experience developing APN profiles or managing these professionals in the field of oncology at their hospitals; and (3) nursing professionals with experience as recognized oncology APNs at their hospital.

Although the literature provides no clear guidelines with respect to the ideal number of Delphi panel members, some recommendations

suggest a sample of 20 to 50 participants (Endacott et al., 1999; McKenna & Keeney, 2008). Given the content under study, the degree of uncertainty and dispute in the literature, and the available resources (Coleman et al., 2013; Keeney et al., 2011), we decided that our study needed an expert panel of at least 30 nurses.

2.3 | Consensus

The researchers established a pre-defined minimum level of consensus of 75%, in line with the study objectives, available resources and the anticipated responses (Keeney et al., 2011; Mcilfatrick & Keeney, 2003). In other words, 75% of the participants had to agree on the statements evaluated (Keeney et al., 2011; McKenna & Keeney, 2008). The competencies that obtained this level of consensus in round 1 were included, unchanged, in the round 2 questionnaire.

2.4 | Information collection

The study included professionals from hospitals in Catalonia (Spain) with oncology or haematological oncology services. The nursing directors were contacted by telephone or email to explain the project and inquire whether the hospital had implemented advanced practice oncology roles. Once this was confirmed, they provided the emails of APN managers and APNs who might be interested in taking part. The participants were contacted by email with a description of the study, a formal invitation to participate and an informed consent form with specific details. Selected participants who gave their consent were sent a link to the first questionnaire.

This Delphi study was restricted to two rounds, as the literature indicates that participants tire of the process after three rounds (Keeney et al., 2011; Walker & Selfe, 1996).

2.5 | Questionnaires

An online questionnaire was used to collect the study data, allowing investigators to easily monitor and analyse the data and participants to maintain their anonymity. The panel members did provide some personal details, including their age, sex, level of education, professional experience and field of work.

The first questionnaire, distributed from March to June 2020, identified the domains of advanced practice and the specific competencies. The items probed whether the different competency domains applied to the APN role, whether APNs used the specific competencies in practice, and if not, whether this would be appropriate. An open question asked panel members to identify the factors required to develop the competencies that participants had stated were not routinely applied. The questionnaire was piloted by eight professionals who were experts on the subject prior to the start of the first round and subsequently adapted based on the responses and feedback.

The second questionnaire was drafted based on the responses to the first, with the aim of establishing consensus in terms of which competencies were applied by APNs. It was circulated in September 2020 to the participants who had completed the first questionnaire.

2.6 | Data analysis

A descriptive analysis of the study variables was conducted. The questionnaires were analysed separately, and SPSS software (version 19.0) was used for the quantitative analyses. In the case of open questions, content analysis was carried out.

2.7 | Ethical considerations

The directors of participating hospitals and the Ethics Committee of the Hospital Universitari de Bellvitge approved the protocol (PR277/18). The study complied with the bioethical regulations (Declaration of Helsinki, 2013) and applicable legislation, including Organic Law 3/2018 on Personal Data Protection and Guaranteeing Digital Rights, and EU Regulation 2016/679 on General Data Protection.

3 | RESULTS

3.1 | Response rate

In the first round, 42 nursing professionals responded (70% of the 60 questionnaires sent out). In the second round, 33 of these panel members (78.6%) contributed; participant characteristics were similar in the two rounds, with no significant differences in demographic or professional characteristics.

Table 1 shows panel members' characteristics. Their mean age was 46.6 years in round 1; and 46.7 years in round 2; all the professionals in the sample were women. Over 90% worked in a hospital, while the rest worked in the academic field. The professional profile in round 1 was female nurses aged 35 to 49 years old (59.53%), with over 20 years' professional experience (59.5%) and a master's degree (61.9%). Most (83.3%) were oncology APNs, and 68.5% had more than 5 years' experience. Just over half (52.4%) worked in a specialist cancer hospital. The study covered the provinces of Barcelona, Girona

TABLE 1 Characteristics of Delphi panel members

Variables		Round 1 (N = 42) n (%)	Round 2 (N = 33) n (%)
Age	21–34 years	3 (7.1)	2 (6.1)
	35–49 years	25 (59.5)	21 (63.6)
	50–65 years	13 (31.0)	9 (27.3)
	>65 years	1 (2.4)	1 (3.0)
Professional experience	5–10 years	5 (11.9)	3 (9.1)
	10–20 years	12 (28.6)	10 (30.3)
	>20 years	25 (59.5)	20 (60.6)
Level of studies	PhD	4 (9.5)	4 (12.1)
	PhD candidate	2 (4.8)	2 (6.1)
	Master	26 (61.9)	20 (60.6)
	Postgraduate or other	10 (23.8)	7 (21.2)
Professional profile	Nurse teacher (academic)	1 (2.4)	1 (3.0)
	Research nurse	2 (4.8)	2 (6.1)
	Advanced practice nurse	35 (83.3)	28 (84.8)
	Nurse manager	4 (9.5)	2 (6.1)
Work centre	Hospital with <500 beds	6 (14.3)	3 (9.1)
	Hospital with ≥500 beds	11 (26.2)	9 (27.3)
	Comprehensive Cancer Centre	22 (52.4)	18 (54.6)
	University	3 (7.1)	3 (9.1)
Experience as an APN[a]	<3 years	6 (17.2)	3 (10.7)
	3–5 years	5 (14.8)	4 (14.2)
	>5 years	24 (68.5)	21 (75.0)

[a]N = 35 advanced practice nurses (APNs) were among the participants in round 1, and N = 28 in round 2.

TABLE 2 Degree of consensus on the definition of competency domains and on the competencies to be developed

Competency domain and specific competencies	Round 1 n = 42	Round 2 n = 33	Must be developed
1. DIRECT CLINICAL PRACTICE			
Competency domain is part of APN role	95.2	100	—
Provide direct care to the patient and family	100	100	—
Demonstrate experience in cancer prevention and detection	64.3	—	100
Perform clinical practice autonomously	83.3	81.8	—
Demonstrate a high degree of knowledge of the oncological process and the needs of cancer patients	92.9	97	—
Develop and implement suitable treatment for complex cancer patients	73.8	—	81.8
Act as an expert clinician (clinical judgement)	71.4	—	100
Adopt a holistic perspective in nursing practice	97.6	97	—
Apply critical thinking in decision-making in complicated, unforeseen and dynamic situations	88.1	81.8	—
Apply reflective practice	76.2	78.8	—
Use evidence-based knowledge in the planning and implementation of nursing care	83.3	84.8	—
Coordinate the patient care process and mobilize resources to give the patient comprehensive care	88.1	93.9	—
Develop assessment strategies to evaluate the needs of the patient, family, and population	97.6	90.9	—
Monitor, evaluate and analyse the results of their interventions	57.1	—	100
Participate in clinical trials or studies for specific research	71.4	—	100
Perform different types of nursing care: Coaching, consultation, mentoring, collaboration	52.4	—	95
Provide care to treat the psychosocial needs of cancer patients	92.9	87.9	—
Demonstrate the capacity to anticipate, manage and respond to a wide range of real or potential health problems that the patients may develop	90.5	93.9	—
Plan the objectives and the care plan in collaboration with the patient and their family	85.7	90.9	—
2. HEALTH PROMOTION			
Competency domain is part of APN role	95	87.9	—
Strive to empower people, groups and communities to adopt health lifestyles and self-care habits	73.8	—	100
Identify the needs of people, groups and communities for whom specific measures can be taken with respect to health promotion and cancer prevention	66.7	—	100
Participate in the evaluation of the results of different healthcare promotion programmes	31	—	96.5
3. EDUCATION			
Competency domain is part of APN role	100	97	—
Evaluate the educational needs of the population	31	—	89.6

(Continues)

TABLE 2 (Continued)

Competency domain and specific competencies	Round 1 n = 42	Round 2 n = 33	Must be developed
Identify the educational needs of patients, students, nurses and other professionals	69	—	84.6
Plan, coordinate and run educational programmes based on the needs detected	47.6	—	100
Implement specific educational programmes	54.8	—	100
Provide health education to the patient and family directly	90.5	100	—
Participate as a teacher on specific courses and official undergraduate and postgraduate study programmes	71.4	—	100
Monitor, evaluate and record the results of the different educational programmes and initiatives run	33.3	—	96.4
Tutor healthcare workers, university students and other people to acquire new knowledge and skills to help them in their professional practice	76.2	87.9	—
Promote the capacity of patients, relatives and communities to participate in making decisions related to the healthcare process and health needs, in accordance with the preferences of the patient, family and/or communities and the resources available	81	75.8	—
Have skills to guide and teach throughout the implementation of treatment and patient care, to the patient, family and the profession itself	90.5	93.9	—
4. CONSULTATION			
Competency domain is part of APN role	97.6	97	—
Provide consultation services in relation to clinical practice, theoretical knowledge and evidence-based practice	90.5	75.8	—
Respond to specific enquiries about complex care of cancer patients	92.9	84.8	—
Respond to specific enquiries related to the patients' oncological process	97.6	93.9	—
Respond to specific enquiries related to the patients' care	100	97	—
Provide clinical and expert administrative consultation	85.7	90.9	—
Make contributions for recommendations adapted to the patients' needs and personalized consultation	97.6	97	—
5. EVIDENCE-BASED PRACTICE			
Competency domain is part of APN role	97.6	100	—
Promote the development of evidence-based practice in the care of the patient, family, community and the population in general	78.6	72.7	100
Actively search for and participate in reviews of current evidence in relation to practice	54.8	—	100
Continuously incorporate changes in the best practices	76.2	60.6	100
Identify areas of practice in which there is a lack of evidence and knowledge	73.8	—	100
Participate in drafting and revising clinical practice guidelines related to healthcare practice	78.6	63.6	100

(Continues)

TABLE 2 (Continued)

Competency domain and specific competencies	Round 1 n = 42	Round 2 n = 33	Must be developed
Disseminate new evidence throughout teams and institutions	73.8	—	100
6. CLINICAL AND PROFESSIONAL LEADERSHIP			
Competency domain is part of APN role	97.6	97	—
Have a vision for oncological nursing practice and patient care and are able to articulate and implement this vision	81	81.8	—
Participate and lead the development and implementation of good care practices, clinical practice guidelines and protocols.	78.6	57.6	100
Develop negotiation and influencing skills for implementing and improving nursing practice	64.3	—	100
Identify needs for change based on the assessment of the patients' needs, generating innovative practices and redesigning solutions to improve the response to the patients' needs and the care provided	69	—	80
Apply practices and roles in line with the patients' health needs based on epidemiological, health, social, legal, political, ethical, professionals and development changes	59.5	—	94.1
Provide leadership in multidisciplinary committees or in the profession itself with respect to the development, implementation and evaluation of policies, procedures, education, research, quality initiatives and clinical practice	45.2	—	100
Work proactively at professional, institutional and systemic level, developing new collaborations and networks of influence for improving the provision of cancer care in healthcare systems	40.5	—	96
Strive to improve the access, quality and cost-effectiveness of healthcare	61.9	—	93.8
7. COLLABORATION AND INTERPROFESSIONAL RELATIONS			
Competency domain is part of APN role	97.6	100	—
Work with the multidisciplinary team to provide comprehensive care to the patient, family and community	100	90.9	—
Work with the patients, families and carers throughout the continuum of care	95.2	93.9	—
Identify potential barriers that may pose an obstacle to collaboration	97.6	93.9	—
Develop and foster collaborative relations with the community and the healthcare system	66.7	—	100
Act as a mediator between the different professionals involved in the healthcare provided	92.9	87.9	—
Improve coordination between the different levels of healthcare	88.1	84.8	—
Provide support in the design and implementation of new healthcare policies	42.9	—	84.6
Reinforce cohesion and communication within the healthcare team	85.7	87.9	—
Balance the workloads evenly	57.1	—	88.8
Optimize referrals to other professionals.	90.5	97	—

(Continues)

TABLE 2 (Continued)

Competency domain and specific competencies	Round 1 n = 42	Round 2 n = 33	Must be developed
Organize and ensure the monitoring of healthcare processes	92.9	90.9	—
8. ETHICAL DECISION-MAKING			
Competency domain is part of APN role	95.2	97	—
Participate in sessions to identify and provide support for the discussion of moral and ethical issues or problems	61.9	—	93.8
Provide leadership in multidisciplinary teams that deal with any ethical or moral disputes that may arise over the course of the process of the illness	47.6	—	95.5
Respect the choices of individuals, providing care without judgement or prejudice, upholding the patients' rights, decisions, autonomy and cultural and spiritual beliefs.	88.1	93.9	—
Foster discussion on advanced care planning at an individual and systemic level	64.3	—	100
Identify, articulate, and actively participate in the ethical matters of the patient, family, professionals, organization and the community and even at a political level	50	—	90.4
9. QUALITY IMPROVEMENT			
Competency domain is part of APN role	97.6	97	—
Develop strategies, projects, and activities, monitoring and improving the quality and efficacy of care	64.3	—	100
Anticipate the variability of clinical practice and are proactive in implementing interventions that guarantee quality	71.4	—	100
Promote improvement in terms of practice and health outcomes in accordance with national and international standards by initiating, facilitating, disseminating and leading changes at an individual, team, organisational and systemic level	45.2	—	100
Continuously evaluate research results and apply them to improve practice	38.1	—	100
Plan and measure opportunities to generate and apply knowledge to practice in processes that can be measured or assessed	33.3	—	100
Consider the perspective of the cost-effectiveness of the patient, team, organization and system when making decisions and use suitable strategies for improving efficacy and efficiency	42.9	—	91.6
10. PROFESSIONAL DEVELOPMENT			
Competency domain is part of APN role	90.5	100	—
Actively search for and participate in reviews of current evidence in relation to practice	71.4	—	91.6
Take responsibility for a lifelong learning process for their own professional development and maintaining their professional competencies	92.9	87.9	—
Have communication skills and contribute towards the development of the work in the areas of practice with publications and the	71.4	—	100

(Continues)

TABLE 2 (Continued)

Competency domain and specific competencies	Round 1 n = 42	Round 2 n = 33	Must be developed
dissemination of their work through presentations at conferences and articles in professional journals			
Disseminate nursing knowledge and research through presentations or publications at a national and international level	59.5	—	100
Participate in collaborative projects with academic institutions	54.8	—	89.5
Participate in continuous reflective practices to improve competency and professional growth	42.9	—	95.8
Take part in continuous training activities and actively participate in professional and specialist nursing organisations/societies	59.5	—	94.1
Perform their duties in accordance with the legal and ethical guidelines established by the regulatory body of the profession.	76.2	81.8	—
Demonstrate an understanding or the legislative and sociopolitical issues that affect decision-making and develop strategies to influence the health results and healthcare policies	59.5	—	82.4
11. RESEARCH			
Competency domain is part of APN role	88.1	97	—
Consistently apply research in the care of cancer patients and the family	64.3	—	93.3
Evaluate clinical practice taking the most recent research findings into account	54.8	—	100
Identify and participate in research on relevant issues in relation to caring for cancer patients as a lead researcher or in collaboration with other members of the healthcare team	57.1	—	94.4
Participate in reviewing research proposals	40.5	—	100
Identify and put forward priority proposals for nursing research in their areas of professional practice	54.8	—	100
Act as a resource for other nurses	71.4	—	100
Interpret and disseminate relevant research results and link them to clinical practice	52.4	—	95.0
Coordinate clinical research projects as a research expert	23.8	—	96.9

and Tarragona. All APNs stated that they worked in multidisciplinary teams. Participants in round 2 showed a similar professional profile (Table 1).

3.2 | Results of the first round

Table 2 shows the results with respect to the 11 proposed competency domains. The consensus achieved regarding the pertinence of these domains to the APN role ranged from 88% to 100%. With respect to the specific competencies performed by oncology APNs, panel members did not reach an acceptable consensus for 52 out of 90 competencies (57.8%) in round 1 (Table 2).

The APN competencies attracting the most agreement fell under the domains of direct clinical practice, consultation and collaboration and interprofessional relations. Meanwhile, none of the competencies pertaining to health promotion, quality improvement or research reached the minimum level of consensus. On the other hand, there was a good level of agreement (81.8% to 100%) that these 52 competencies should be part of the APN's role (Table 2).

3.3 | Results of the second round

In the second round, the consensus on the definition of the 11 competency domains remained over 87% in all cases (Table 2). Of the 38 specific competencies that met the threshold for consensus in the first round, four competencies (10.5%) did not reach a consensus of 75% in the second. Three of these belonged to the domain of evidence-based practice, and the remaining one was classified under the domain of clinical and professional leadership (Table 2). All panel members agreed that these four competencies should be part of the APN role (Table 2).

TABLE 3 Determinants of competency development among advanced practice nurses in oncology, according to Delphi panel members (N = 151 responses)

Determinants related to competency development, n (%) responses

Resources, 9 responses (5.9%)
Material and financial resources; access to scientific articles, databases
Associated competency domains: Direct clinical practice; education; evidence-based practice; quality improvement; professional development

Nursing knowledge, 12 responses (8.0%)
Knowledge exchange, networks, forums; research expertise; multidisciplinary clinical nursing sessions; coordination with universities and schools; methodologies for reviewing evidence and drafting clinical practice guidelines
Associated competency domains: Direct clinical practice; education; evidence-based practice; ethical decision-making; quality improvement; professional development; research

Education, 44 responses (29.1%)
Education; specific education related to the different domains; PhD-level education
Associated competency domains: Direct clinical practice; healthcare promotion; education; consultation; evidence-based practice; clinical and professional leadership; collaboration and interprofessional relations; ethical decision-making; quality improvement; professional development; research

Leadership, 18 responses (11.9%)
Empowerment; autonomy in decision-making and recognition of nursing professionals; leadership capacity; positions of influence for nurses in relation to healthcare policies; greater participation in decision-making; performance of nurse-led studies; greater presence in healthcare promotion programmes
Associated competency domains: Direct clinical practice; healthcare promotion; education; consultation; clinical and professional leadership; collaboration and interprofessional relations; ethical decision-making; quality improvement; professional development; research

Availability of time, 23 responses (15.2%)
Time for research within working hours; time during patient visits; time for training; time for activities in different competency domains
Associated competency domains: Direct clinical practice; healthcare promotion; education; evidence-based practice; quality improvement; professional development; research

Workload, 8 responses (5.3%)
Reducing workloads; balancing the workload evenly within teams; reducing the patient/nurse ratio; reducing workloads to spend more time on research
Associated competency domains: Direct clinical practice; healthcare promotion; education; collaboration and interprofessional relations; quality improvement; professional development; research

Community healthcare system, 15 responses (9.9%)
Collaboration with primary care for health promotion; coordination within the system; improving relations between primary and hospital care; health programme
Associated competency domains: Direct clinical practice; healthcare promotion; education; clinical and professional leadership; collaboration and interprofessional relations

Outcomes evaluation, 9 responses (6.0%)
Improving command of tools for analysing outcomes of nursing interventions; tools that enable outcomes evaluation in health programmes; data management tools for recording, monitoring, and analysing outcomes; tools for establishing and evaluating indicators; continuous evaluation of practice
Associated competency domains: Direct clinical practice; healthcare promotion; education; quality improvement

Development of nursing practice, 4 responses (2.6%)
Treatment protocols; autonomous decision-making
Associated competency domains: Direct clinical practice; education

Attitudes/behaviours, 5 responses (3.3%)
Perseverance; involvement and responsibility of nursing professionals
Associated competency domains: Education; evidence-based practice; clinical and professional leadership; professional development; research

Role of institutions, 4 responses (2.6%)
Institutions' recognition of the value of APNs; maturity of the teams; institution-supported professional development and facilities
Associated competency domains: Education; collaboration and interprofessional relations; professional development; research

3.4 | Factors required for developing APN competencies in oncology

The open question, designed to identify the factors required for developing the competencies that did not obtain a consensus of 75%, yielded 151 responses. The domain garnering the most interest was direct practice (17.2%), followed by education (15.2%). Both the research and quality domains were highlighted in 11.3% of the responses. The domain with the fewest responses was consultation (2.0%).

The responses are grouped by topic in Table 3. Specific training as a factor required for APN competency development was mentioned in all domains and accounts for 29.1% of the responses. Reserved time to develop the competencies is mentioned in 15.2% of the responses, under seven competency domains. Another 11.9% of the responses were related to leadership, for instance, calling for autonomy in decision-making, nurses' leadership capacity and empowerment. These responses were associated with the competencies in 10 of the 11 domains. Relations with the community and between the different levels of the health care system accounted for 9.9% of the responses, while factors related to nursing knowledge were highlighted in 8.0%. Other issues mentioned included resources, workloads, nursing practice, the nurses' attitude and the role of the institutions (Table 3).

4 | DISCUSSION

The study sought to identify areas of consensus in the definition of competency domains and in the development of APN competencies in oncology, taking as a starting point the competencies defined by scientific oncology societies (CANO/ACIO, 2001; EONS, 2018; ONS, 2019) and the Hamric model (2014). In addition, we explored the difficulties in implementing the competencies that were underdeveloped.

Broad consensus was obtained in both rounds in terms of the definition of the competency domains, but with regard to the specific competencies comprised within them, the first round yielded a consensus on just 38 out of 90 competencies (42.20%) that the panel agreed were performed in practice. In the second round, the level of agreement fell further, to 34 competencies (37.77%). Despite the low level of implementation reported, panellists broadly agreed that all competencies described should be part of daily APN practice.

In general, our results indicate a limited implementation of advanced practice nursing in oncology. Although the study reflects some development of APN competencies, it is evident that this development stops short of fulfilling its full potential. These results are in line with other studies in our context (Sevilla Guerra et al., 2018, 2021). In the absence of any regulations on advanced practice in Catalonia, the initial implementation of these roles tends to be oriented more towards clinical practice than the holistic development of the full scope of practice, with the roles created in response to the needs emerging in different settings.

There was a high level of consensus around the performance of the different competencies encompassed under the domains of direct clinical practice, consultation and collaboration and interprofessional relations. These findings may be associated with the fact that APNs work in multidisciplinary teams, coordinate care processes and provide direct care to patients and families, serving as focal points for the patient and family as well as for other professionals. They also work autonomously, demonstrating in-depth knowledge about individual patients, which hones their ability to anticipate, manage and respond to patients' health problems. The competencies that did not obtain consensus in these domains were related to the monitoring and evaluation of outcomes and the performance of specific interventions such as coaching, mentoring, counselling and the balance of workloads.

Other domains in which the competencies did not reach the cut-off for consensus were health promotion, evidence-based practice, research, and quality improvement. Likewise, there was no consensus on the performance of specific competencies from other domains such as leadership or ethical decision-making, which encompass outcomes evaluation, research, participation in health policies, competencies related to the community or the population, dissemination of results and evidence review.

Sevilla Guerra et al. (2021) reported similar results, although these are not entirely comparable due to differences in the study design; in that study, advanced practice was described as focusing on the domains of planning expert care and comprehensive care. In the domains of research and evidence-based practice as well as professional leadership, a lower proportion of nurses met the standard established.

Goemaes et al. (2019) reported that nurses carried out activities mainly in the domain of the patient and family and also of the team and the health care organization. Regarding their role, APNs dedicated the most time to acting as expert clinicians and the least to exercising leadership, while they did not carry out any specific activities in the area of ethical decision-making.

Our results differ from those obtained by Jokiniemi (2018, 2021), who reported limited time spent on direct patient care or contact by APNs; in contrast, direct clinical practice was one of the most highly developed competency domains in our study.

It is difficult to specifically compare the implementation of advanced practice competencies in different settings or even countries since the tools used for its evaluation are different (Gardner et al., 2016; Jokiniemi et al., 2021). In both the study of specific advanced practice competencies and the tools to identify advanced practice, the definition of domains or spheres of competencies are different, although the definition of competencies is possibly very similar.

In our study, the need for specific education was the aspect most frequently cited in relation to underdeveloped competencies, and this was associated with all competency domains. Jean et al. (2019) highlighted the lack of a legal framework or vision of the APN role in Spain as a barrier to the development and implementation of advanced nursing practice, so regulations establishing education and certification standards would favour the full development of advanced

practice and improved health outcomes for patients (Heale & Rieck Buckley, 2015). On the other hand, the strategic, complete implementation of the APN role requires the involvement and support of the organization's managers and administrators, as well as the availability of curricula to educate and empower APNs (Dowling et al., 2013; Goemaes et al., 2019; Van Hecke et al., 2019).

Apart from education, constraints on time, space and resources were described as hampering the development of research competencies. In addition, nurses reported the need for more time for direct clinical practice, health promotion, education and teaching, and evidence-based practice, suggesting that heavy workloads prevented them from developing practice-specific competencies (Goemaes et al., 2019). This information is relevant and may be useful to managers working towards the implementation of these advanced practice roles.

Other aspects of interest were related to the generation of evidence-based knowledge and practice, the lack of coordination with universities, the educational level of nurses and the need to exchange knowledge with other oncology APNs. In Ryder's (2019) study, APNs were associated with autonomous decision-making and the exercise of leadership to improve care delivery, but the need for support from academic nurses in the area of research was also detected.

In our study, the lack of tools to evaluate both nursing practice and the outcomes of nursing interventions was linked to the development of competencies related to the quality of care and research. This finding points to the need to implement evaluation tools to better understand the impact of APN care on patients and on the health system.

At the same time, there was broad consensus on the APNs' performance of clinical leadership in terms of autonomous decision-making for the patient; however, difficulties in implementing leadership within teams, institutions and the health system reflected some lack of empowerment on the part of the nurses along with limited institutional support for the implementation of the roles, professional development and recognition of the value of oncology APNs. This translates into a restricted vision of the APN in the hospital setting and the lack of community programmes involving APNs, as well as difficulties in establishing circuits and communication between different levels of care. These findings are in line with Heinen et al. (2019) in terms of the need to develop clinical, professional and system leadership by APNs so that they can exert influence at a strategic level and share an organisational vision on quality improvement.

4.1 | Limitations

The limitations of this study reside in the research and analysis method. While the Delphi method is generally considered an effective tool for determining expert consensus, it has also been criticized for its susceptibility to various biases. A significant limitation of the Delphi technique comes from the definition of consensus itself, as there is little agreement on how best to define the term (Keeney et al., 2011; Williams & Webb, 1994). The definition of consensus is thus inherently determined—at least to some extent—by the

researcher's subjective opinion. Another limitation of the study is that not all Catalan provinces were represented, as the panel included only the experts who agreed to participate. Thus, the competencies identified may not be appropriate for all regions or hospitals.

Moreover, it is unknown how many nurses work in advanced practice positions, as there is no register of this type of nurses either at a regional level in Catalonia or nationally in Spain (Sevilla Guerra et al., 2018).

In our study, and following ICN criteria with respect to training for APNs, 76.2% and 78.9% (depending on the round) of the nurses who took part in the study had at least a master's degree.

Despite providing information to panel members about the Delphi method, sending reminder emails for each round and giving feedback after the first round, the dropout rate between the first and second questionnaires was 21.4%. This is consistent with the response rates of other Delphi studies, with rates varying between 15% and 80% (Barrett et al., 2001; Mcilfatrick & Keeney, 2003).

5 | CONCLUSIONS

This study describes the scope of the competencies exercised by oncology APNs in Catalonia and identifies the competencies that still need development. Implementation of advanced practice roles in the oncology field in Catalonia is a work in progress. Domains related to direct clinical practice, consultation, and collaboration and interprofessional relations are relatively well developed, whereas leadership, research, evidence-based practice and quality improvement are not. Thus, our results indicate that APN practice in Catalonia is aligned with the ICN definition (ICN, 2020) of the clinical nurse specialist with regard to the clinical competencies performed, but not in terms of the indirect competencies associated with this role.

Obstacles to implementation were related to nurse education, leadership skills, time constraints and relationships between the different care levels of the health system and the community. Identifying these barriers can facilitate the design of strategies that allow further development of APN competencies, improved nurse education, explicit definition of professional roles and more precise job descriptions for use by nurse managers.

In terms of the development of competencies among oncology APNs, the results of this study enable further progress in integrating and standardizing the APN role in this setting. In a context with no regulations on advanced practice nursing, a better delineation of competencies can contribute to more clarity in the role and facilitate management decisions in care institutions—elements that must necessarily underpin the development of advanced practice nursing and optimal patient care in institutions delivering cancer care.

There is a need to develop a competency framework and nursing practice standards, which can lay the foundation for defining educational requirements and designing a certification system to support the implementation of advanced practice nursing. This study could be a starting point to establish such a framework. This is a very initial investigation of the competency development in oncology APNs in

Catalonia. Future studies are needed to obtain a deeper understanding of advanced practice, real-life performance of the different competencies and more specifically, the impact of settings and contexts.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

The underdeveloped competencies identified in this study, together with the barriers hindering progress, should be analysed by administrators and institutions. Nurse managers should reflect and be mindful of the difficulties they may encounter when leading efforts to implement advanced practice roles. Shedding light on these challenges can enable the design of strategies that promote the development of the full scope of APN practice.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

ETHICS STATEMENT

The directors of participating hospitals and the Ethics Committee of the Hospital Universitari de Bellvitge approved the protocol (PR277/18). The study complied with the bioethical regulations (Declaration of Helsinki, 2013) and applicable legislation, including Organic Law 3/2018 on Personal Data Protection and Guaranteeing Digital Rights, and EU Regulation 2016/679 on General Data Protection.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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ORIGINAL ARTICLE

WILEY

Association between triage nurses' job satisfaction and professional capability: Results of a mixed-method study

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Abstract

Aim: This study aims to examine factors related to the job satisfaction of triaging nurses and their professional capability in the clinical setting.

Background: Triage is a complex process that relies on making decisions in favour of the patient and his treatment. The professional capability of a triaging nurse is an important psychological construct of job satisfaction.

Methods: The study used a mixed-method methodology, with data collection based on an explanatory research design. The research instrument in the quantitative part was a survey questionnaire, and in the qualitative part, a semi-structured interview. The results were integrated using the 'Pillar Integration Process'.

Results: There are significant relationships between professional capability and job satisfaction. Six main topics were exposed: characteristics and traits, work organization, safety is the key, burdening circumstances, capability and self-evaluation.

Conclusion: Professional capability is associated with job satisfaction. The necessary managerial changes should be made to achieve job satisfaction and develop professional competence while focusing on already trained and competent triage nurses, as satisfied triage nurses will stay longer in the institution.

Implications for Nursing Management: The manager's job is to be aware of the level of job satisfaction, take care to develop their employee's professional capability and take action in case of disrupted balance.

KEYWORDS
emergency, job satisfaction, joint display, nurse, professional capability, triage

1 | BACKGROUND

Nurses perform various clinical tasks, such as assessing and performing nursing activities, providing daily care to patients, helping patients adjust to their illnesses and supporting the patient and family members (Akerjordet et al., 2018). Providing quality and safe nursing care is an important part of nurses' job performance, indicating their effectiveness in performing their duties and responsibilities in patient nursing care (Chen et al., 2019). Workplace health promotion is important in ensuring a healthy and efficient workforce in nursing care (Williams et al., 2018). Furthermore, Furunes et al. (2018) state that due to performing these various clinical tasks, nursing leadership has an

important role in developing and implementing strategies for promoting health in the workplace. The quality of nursing leadership is essential in creating a supportive and healthy work environment to ensure productivity, professional commitment, job satisfaction and professional capability (Akerjordet et al., 2018). For that reason, a nurse is expected to be satisfied with their job. Nurses today are looking for a job with high job satisfaction and a culture that supports them in professional capability development (Kowitlawkul et al., 2019). Job satisfaction among triage nurses (TNs) is closely related to working conditions, organizational environment, workplace stress, role ambiguity and conflict and organizational and professional capability (Barać et al., 2018; Lu et al., 2012). Professional capability is essential in nursing to ensure patient safety, satisfaction, and quality care (Torabizadeh et al., 2019), which can only be achieved with nurses who are sufficiently professionally trained (Torabizadeh et al., 2019), who conveys a sufficient degree of confidence and assurance in their knowledge in the delivery of specific specialized interventions (Nagarajan & Prabhu, 2015). Nurses' professional capability has emerged as an important psychological construct in job satisfaction (Barać et al., 2018). The increase in professional capability is particularly important in intensive care units and emergency departments, where nurses care for life-threatened patients (Bijani et al., 2018; Torabizadeh et al., 2019).

Triage is a professionally demanding and responsible work requiring a wide range of professional capabilities, good judgement, work experience and critical decisions (Reay et al., 2020; Sutriningsih et al., 2020). The main purpose of triaging patients is to optimize the waiting time concerning the seriousness of the patient's health condition, thus enabling timely health care and reducing the risk of worse health prognosis due to excessive waiting for medical treatment (Alumran et al., 2020; Bijani et al., 2018). The triage process is directly influenced by the level of capability of TN, namely, their ability to accurately assess the patient's health condition, which means that they can provide the patient with appropriate quality health care or, on the contrary, put the patient's safety or life at risk (Hitchcock et al., 2014).

Grossmann et al. (2012) exposes prolonged hospitalization, overcrowding in emergency departments, patient dissatisfaction, and inferior quality of care as a consequence of less professionally trained health professionals placed in the triage area. On the other hand, Bijani et al. (2018) also adds permanent harm and death of patients due to inappropriate triage categorization. Forsman et al. (2012) further emphasize the importance of appropriately trained TN, as, according to them, a TN should be skilled, intelligent and empathetic with at least 1 year of experience working in the emergency setting and have undergone professional training to perform triage (Ebrahimi et al., 2016; Forsman et al., 2012). A study conducted in Slovenia showed that nurses believe that at least 2–10 years of experience is necessary to effectively perform triage (Cotič Anderle & Bračko, 2019). A similar conclusion has also been reached in international research, where at least 3 years of work in emergency care are needed for safe and successful triage work (Duko et al., 2019; Sutriningsih et al., 2020).

Job satisfaction among TNs and their professional capability is becoming an important topic that should be investigated due to

constantly changing factors and the emerging shortage of qualified and experienced TN. Therefore, the study investigates the factors related to job satisfaction and professional capability of TN in the clinical setting.

2 | METHODS

2.1 | Study design

An explanatory sequential mixed-method design was used in the study. Such methods are used for an in-depth examination of the study problem, thus gaining deeper substantiated results (Creswell & Clark, 2017).

2.2 | Study sample and setting

2.2.1 | Quantitative phase

In the quantitative part of the study conducted among TNs, we used a cross-sectional descriptive survey. Convenience sampling was used, and the G*Power 3.1. software was used to calculate the sample size. The required sample size for this study was $n = 95$ (effect size = .25; power = .95; alpha = .05). To ensure a sufficient sample size for possible missing data or dropouts, 110 questionnaires were distributed to emergency departments. We received 97 completed questionnaires, representing a sample realization of 88.1%. The inclusion criteria for the selection of participants in the study were completion of an undergraduate nursing programme, employment in an emergency department, completion of training and licencing in the use of the Manchester Triage System algorithms and active involvement in triage activities in the emergency department at least for 1 year.

2.2.2 | Qualitative phase

The second phase of the study was as well undertaken in one of the largest hospitals in Slovenia. Alongside this, we used a method of semi-structured in-depth interviews to describe experiences, events and occurrences. A purposive sampling (Polit & Beck, 2012, 2022) was used, which meant that we targeted TN working in the emergency department. Overall, 10 TNs were asked to participate in interviews, and the total number of interviewees was nine (response rate = 90%). The inclusion criteria for the sample were the same for the quantitative phase of the study.

2.3 | Data collection and measuring instruments

2.3.1 | Quantitative data collection

The quantitative part of the study was conducted in six selected emergency departments across Slovenia from June to August 2021. As the principal measurement instrument for determining job

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satisfaction and self-evaluation of the professional capability of TN in Slovenia, we used a questionnaire summarized from two internationally validated and well-established questionnaires on job satisfaction and professional capability.

Within the TN's job satisfaction, we used the Nurses' Job Satisfaction Scale (NJSS) questionnaire (Lin et al., 2007), designed to assess job satisfaction in the nursing workplace and is divided into five domains of satisfaction. The internal reliability Cronbach's α coefficient for the NJSS was $\alpha = .948$ for 27 variables (Table 1).

The TN's professional capability questionnaire (TNPCQ) (Bijani et al., 2020) comprises 35 statements, which in their entirety constitute the spectrum of skills and knowledge of an emergency care nurse and is designed to evaluate the psychometric characteristics of the TN and is divided into three domains of TN's professional capability. The Cronbach's α reliability coefficient for the full questionnaire was $\alpha = .961$ (Table 1).

2.3.2 | Qualitative data collection

Within the qualitative part of the research, a semi-structured interview was used to collect data. The questions were formulated based on a literature review and the quantitative part of the study. Interview data collection ended after the ninth interview was conducted when we started to reach data saturation as the key data became repetitive among participants, and no new topics emerged to illuminate the phenomenon (Polit & Beck, 2012, 2022). All the interviews were audio-recorded, literally transcribed and analysed without returning to participants for comment and/or corrections.

As part of the qualitative research, purposively selected TNs were invited to participate in an interview. At the beginning of qualitative

research, the interviewees were informed about the aims and objectives of the research, including their assured anonymity. At the same time, the interviewees signed a document with an agreement to participate in the research (interview), with which they gave their written consent to participate. They were given a set of questions for review. We used an interview guide with 10 main and five supporting questions. After signing the informed consent, each interviewee was assigned an 'interviewee code', which concealed their identity.

The qualitative part of the study was conducted in August 2021, after completing the first phase of quantitative data gathering in one of the largest emergency departments in Slovenia.

2.4 | Data management and analysis

Qualitative and quantitative data have been analysed separately and compared in the integration phase.

2.4.1 | Quantitative phase

Data were processed using IBM SPSS 23.0. Descriptive statistics were used to describe the job satisfaction and professional capability scores within each domain and sociodemographic characteristics by frequency, mean and standard deviation. The non-parametric Spearman's correlation coefficient was used to test the correlation between the variables of the professional capability of TN and job satisfaction. Multiple linear regression was used to upgrade the correlation of the variables. The dependent variable used was the overall satisfaction of TN, and the independent variables represented sex, age, years of experience in triage and the domains of nurses' professional

TABLE 1 Instruments for measuring job satisfaction of TN

Questionnaire	Author, year	Study locus	Score	Domains and range of questions	Reliability of Cronbach's α
Nurses' Job Satisfaction Scale (NJSS)	Lin et al., 2007	Assessing job satisfaction in healthcare	Five-level Likert scale	Domain 1: Working environment (1–3)	.808
				Domain 2: Interpersonal relations (4–7)	.768
				Domain 3: Feedback regarding the conduction of health care (8–10)	.617
				Domain 4: Benefits and promotions (11–15)	.916
				Domain 5: Workload (16–21)	.878
				Domain 6: Organizational factors (22–27)	.752
The triage nurses' professional capability questionnaire (ENTER)	Bijani et al., 2020	Evaluation of psychometric characteristics of a triage nurse	Five-level Likert scale	Domain 1: Competences (1–20)	.953
				Domain 2: Psychological empowerment (21–26)	.904
				Domain 3: Commitment (27–35)	.819

capability, that is, commitment, competence and psychological empowerment.

2.4.2 | Qualitative phase

Data were analysed using the inductive thematic analysis of the results by Braun and Clarke (2021), which was carried out in the following six steps: (1) familiarization with the data, (2) generation of initial codes, (3) search for topics, (4) review of topics, (5) identification and naming of topics and (6) production of the report. The transcribed text was coded for meaning, and semantic codes were grouped into subtopics, which were later developed into main topics. Two independent researchers carried out the coding, subcoding and development of the main topics, with further refinement of all topics by a third author at the end. The authors discussed any discrepancies until they reached a consensus.

2.4.3 | Integration

To integrate qualitative and quantitative data in our study, we used the 'Pillar Integration Process' (PIP) (Johnson et al., 2019), which corresponds to a transparent four-step data integration process: (1) phase of listing the most relevant qualitative and quantitative data in the form of tables/graphs/matrices, (2) phase of corresponding the data on the opposite side of the tables/graphs/matrices, (3) a phase of checking matching data to ensure appropriate categorization and refinement of data lists and codes and (4) a pillar-building phase to record the conclusions drawn from the mixed study data analysis. We used an integration table (Table 6) to illustrate the four-step data integration process.

2.4.4 | Rigour and trustworthiness

In the qualitative part of the study, we considered the criteria for assessing quality, namely credibility, consistency, transferability and confirmability (Korstjens & Moser, 2018; Lincoln & Guba, 1985; Tracy, 2010). Credibility was achieved by transcribing the interviews verbatim without changing the interviewees' terminology. Consistency is an additional criterion for achieving reliability; it requires systematic procedures in performing data analysis. Establishing the consistency of qualitative data must use a systematic process for organizing and analysing data (e.g., coding and identifying common themes). The data analysis process can also be consistent by establishing inter-coder or inter-rater reliability of the analysis. The last criterion, that is, transferability, is related to the external validity and the possibility of transferring the results beyond the confines of our research setting and sample (Korstjens & Moser, 2017; Lincoln & Guba, 1985; Tracy, 2010). In other words, this means that the study results can benefit those who were not actively included.

2.5 | Ethical considerations

Approval to undertake the study was obtained through the Ethical Committee University of Maribor, Faculty of Health Sciences (No. 04/8R-2021). Simultaneously, informed consent was obtained from selected emergency departments across Slovenia and participated interviewers where the survey took place.

3 | RESULTS

3.1 | Quantitative results

The study participants were 70 women (72.2%) and 27 men (27.8%) working as TN. Most respondents had, on average, 0–5 years of work experience in emergency care (38.1%), with an average of 1–3 years in triage (51.5%). TNs estimate that they spend an average of 27.66 h per week in triage (Table 2).

TABLE 2 Demographic data of respondents

	Frequency (N = 97)	Percentage (%)
Sex		
Male	27	27.8
Female	70	72.2
Final education		
Associate Degree in Nursing (ADN)	4	4.1
Bachelor's Degree in Nursing (BSN)	72	74.2
Master's Degree in Nursing (MSN)	19	19.6
Doctor of Nursing Practice (DNP)	2	2.1
Work experience in emergency care		
0–5 years	37	38.1
5–10 years	15	15.5
10–15 years	9	9.3
15–20 years	10	10.3
Over 20 years	26	26.8
Work experience in triage care		
1–3 years	50	51.5
4–6 years	25	25.8
7–9 years	8	8.2
10–12 years	14	14.4

	$\bar{x}$ (SD)	Min	Max
Age	40 (10.06)	26	58
Total years of work experience	17.21 (11.297)	2	39
Mean number of hours at triage per week	27.66 (11.006)	1	50

Abbreviation: SD, standard deviation.

We found that TNs assess their work interesting ($n = 93$; 95.9%) and varied ($n = 97$; 100%). Most respondents ($n = 71$; 73.2%) consider the working environment pleasant, while a slightly smaller proportion ($n = 26$; 26.8%) is dissatisfied with the working environment.

TN achieved the highest job satisfaction score with organizational factors ($\bar{x} = 20.74$; $SD = 3.50$), especially in professional relationships with their supervisor and patient handover by paramedics. They are least satisfied with their work environment ($\bar{x} = 9.98$; $SD = 2.12$), that is, workload, safety environment and full-time working conditions.

In self-evaluation of TN's professional capability, the highest mean scores within the competence domain were achieved, specifically in having knowledge ($\bar{x} = 4.36$; $SD = 4.36$) and being skilled in cardiopulmonary resuscitation ($\bar{x} = 4.46$; $SD = 0.646$) and being knowledgeable of pathophysiology ($\bar{x} = 4.48$; $SD = 0.600$). On the other hand, TN considers themselves less professionally capable in terms of making a clinical judgement based on clinical guidelines, research and literature ($\bar{x} = 4.08$; $SD = 0.739$) and knowledge of the use and being knowledgeable about the usage and side effects of medicines in the emergency case ($\bar{x} = 4.10$; $SD = 0.952$).

We found a moderate positive correlation between the domains of TN's professional capability (TNPCQ) and the domains of job satisfaction scores (NJSS), namely, interpersonal relations—commitment ($r = .373^{**}$; $p < .01$) and workload—psychological empowerment ($r = .369^{**}$; $p < .01$). The highest correlation is between the two domains within professional capability, namely, competencies and commitment ($r = .813^{**}$; $p < .01$) (Table 3).

There is a medium linear correlation between the selected TN satisfaction variables and the professional capability domains (competencies, psychological empowerment and commitment) ($R = .660$). The coefficient of determination shows that 43.6% of the total variance in the professional capability domains of TN can be explained by the variability of the independent variable satisfaction of TN (Table 4). The quality of the regression model was tested with the F test with $p < .001$, and this indicated that the quality of our model is good.

Table 5 shows that the satisfaction of TN is inversely proportional to the professional capability domain competences (TNPCQ_dom1), with sex and age. On the other hand, we established direct proportionality between the satisfaction of TN with the professional capability domains of psychological empowerment (TNPCQ_dom2) and commitment (TNPCQ_dom3) and triage years. The explanatory variable commitment, triage years and psychological empowerment statistically significantly affect the satisfaction of TN ($p < .001$; $\beta \neq 0$).

3.2 | Qualitative results

The participants consisted of nine TNs (three males and six females) with mean interviewees age of 31 years ($SD = 11.09$). All the participating interviewees were registered nurses, except one interviewee who held a Master of Nursing. The mean total length of work experience was 8 years, of which 6 years were in emergency nursing and 4 years in triage nursing. Three main topics were highlighted in the analysis of the interviews in the qualitative part of the research. The

TABLE 3 Spearman's test for bivariate correlation between NJSS domains and professional capability

	NJSS_total	NJSS_dom1	NJSS_dom2	NJSS_dom3	NJSS_dom4	NJSS_dom5	NJSS_dom6	TNPCQ_dom1	TNPCQ_dom2	TNPCQ_dom3	TNPCQ_total
NJSS_total	1										
NJSS_dom1	.792**	1									
NJSS_dom2	.753**	.586**	1								
NJSS_dom3	.764**	.543**	.669**	1							
NJSS_dom4	.906**	.703**	.641**	.677**	1						
NJSS_dom5	.877**	.657**	.660**	.528**	.766**	1					
NJSS_dom6	.792**	.718**	.453**	.596**	.652**	.645**	1				
TNPCQ_dom1	.088	.019	.190	.120	.240	.124	.234*	1			
TNPCQ_dom2	.306**	.213*	.325**	.229*	.204	.369**	.290**	.636**	1		
TNPCQ_dom3	.284**	.216*	.373**	.247*	.206*	.307**	.354**	.813**	.700**	1	
TNPCQ_total	.211*	.097	.267**	.209*	.136	.259*	.315**	.940**	.781**	.913**	1

Abbreviations: NJSS, Nurses' Job Satisfaction Scale; NJSS_dom1, work environment; NJSS_dom2, interpersonal relations; NJSS_dom3, feedback regarding the conduct of nursing; NJSS_dom4, benefits and promotions; NJSS_dom5, workload; NJSS_dom6, organizational factors; p value, two-tiled statistical significance; TNPCQ, professional capability of TNs; TNPCQ_dom1, competences; TNPCQ_dom2, psychological empowerment; TNPCQ_dom3, commitment.

*$p < .05$.

**$p < .01$.

TABLE 4 Correlation and determination coefficients and *F*-test result

Model	R	R²	Corrected R²*	σ	F	p value
1	.660	.436	.398	12.501	11.340	<.001

Abbreviations: independent variables (years of triage, gender, age, competences, psychological empowerment and commitment); *F*, quality of the regression model; *p* value, two-tailed statistical significance; *R*, correlation coefficient; R^2, determination coefficient; R^{2*}, corrected determination coefficient; *σ*, standard error of estimate of the independent variable.

TABLE 5 Regression coefficient and *t* test

		Nonstandardized coefficient		Regression coefficient		
Model		B	σ	β	t	p value
1	Constant NJSS_total	48.158	14.192	/	3.393	.001
	TNPCQ_dom1	−0.808	0.242	−.489	−3.340	.001
	TNPCQ_dom2	0.720	0.596	.152	1.208	.230
	TNPCQ_dom3	2.209	0.586	.558	3.771	<.001
	Sex	−5.018	3.069	−.138	−1.635	.106
	Age	−0.975	0.159	−.047	−0.471	.639
	Years of triage	18.322	3.880	.482	4.722	<.001

Abbreviations: *B*, estimate of parameters; NJSS_total, independent variable satisfaction of TNs; *p* value, two-tailed statistical characteristic; *t*, test of individual characteristic; TNPCQ_dom1, competences; TNPCQ_dom2, psychological empowerment; TNPCQ_dom3, commitment; *σ*, standard error or estimate of the independent variable.

exposed main topics were (1) 'clinical activity', (2) 'workplace' and (3) 'professional capability of TN'.

3.3 | Clinical activity

TNs exposed problems they have to face daily during their work in triage, such as a high level of responsibility, doctors' disagreement with triage categories, physical and psychological overload due to the high frequency of patients coming to the emergency department. In addition, TNs are often the target of rudeness and physical-psychological violence from patients. These factors can make TN tired and overwhelmed, leading to a lack of concentration at work:

TN5: 'The most common problems in triage are the waiting time of an already triaged patient, stress due to the huge income of patients, [...], work overload'.

TN4: 'If, for any reason, the waiting time for treatment is prolonged, [...] patients become reluctant, nervous, rude, violent. Since they can't go directly to the clinics, they come back to us—TN and release their anger here'.

3.4 | Workplace

The interviewed TN described the work in triage as varied, dynamic and interesting but at the same time quite stressful. According to most, work in triage demands a lot of theoretical knowledge in various fields of emergency medicine:

TN1: 'I like doing my work in triage, it brought me a lot of theoretical knowledge. [...] in triage I don't feel any fear, but only greater confidence and determination regarding my knowledge'.

The interviewees highlighted the need to modify the existing work process, which could be improved by introducing certain innovations: the introduction of a permanent presence of a doctor in triage, better organized and adapted triage rooms, the renovation of the computer programme, regular training and clear instructions in the organizational unit:

TN5: ' ... more time for triage, better-organised premises—faster accessibility with the consultation of triage nurses and doctors'.

3.5 | The professional capability of TN

A nurse's interpersonal skills, whether innate or acquired, contribute to the skilful performance of triage. Interpersonal skills cover various aspects in which communication and cooperation are crucial. The interviewees also highlighted the importance of sufficient professional capability, experiences, teamwork, communication, ability to negotiate and organizational skills for the successful work of TN:

TN7: 'Good professional development and training mean greater professionalism, quality, and safety in one's work'.

TN2: 'The quality of triage is influenced by the professional qualification and experience of the nurse, and the time it takes to really focus on the patient and understand him'.

In the conversation, the interviewees emphasized the importance of TN's qualities such as determination, responsibility, criticality, dedication and interest in work:

TABLE 6 Results of pillar integration process

Results of QUAN study		Data integration pillar		Findings of the QUAL study
1	2	3	2	1
The results refer to the properties of triage nurse and their performance in the profession.	TNs have with a high mean of responses confirmed the extreme importance of the nurse's practice ($\bar{x} = 4.60/5$; $SD = 0.571$). They perform their work conscientiously and precisely ($\bar{x} = 4.45/5$; $SD = 0.613$), respect the dignity of the patient and his/her relatives ($\bar{x} = 4.49/5$; $SD = 0.580$), cooperate with the rest of the team in providing appropriate health care ($\bar{x} = 4.49/5$; $SD = 0.580$) and respect and accept the opinions of the other members of the team ($\bar{x} = 4.48/5$; $SD = 0.614$).	Characteristics and traits	Individual characteristics	'The triage nurse must have the skills of observation and recognition, patience, [...], adaptability [...]'. (AI₃) 'She must be a good listener and observer, have a sense of intuition and rely on it. She must be able to think critically'. (AI₉)
			Interpersonal characteristics	'[...] a well-developed ability to communicate and be oriented in the moment'. (AI₅) 'She must have very good communication skills, communication with the patient, communication with the relatives, communication with the doctor. She must be a good organiser, get all the patients in the right place'. (AI₆)
			Clinical judgement	'[...] and be able to react quickly in emergency situations'. (AI₃) '[...] ability to make quick judgements, asking focused questions'. (AI₉)
The results refer to the satisfaction and organization of triage work.	Referring to the study data, TNs with longer seniority in triage are more satisfied with the redesign of the work process and organization ($U = 268.000$; $p \leq .001$*), with the teamwork ($U = 265.000$; $p \leq .001$*), with the organization of the rotation of work sites ($U = 172.000$; $p \leq .001$*) and with the work schedule in triage ($U = 134.000$; $p \leq .001$*). The mean score for satisfaction with the working climate in the ward was $\bar{x} = 3.76/5$; $SD = 0.839$. The TNs have assessed the domain 'working environment' with a mean of $\bar{x} = 9.98/13$; $SD = 2.12$. According to the TNs, 73.2% of them work in a pleasant working environment, while the remaining 26.8% deny a pleasant working environment.	Work organization	Organizational factors	'There, one of the triage staff should be a doctor. [...] to reorganise the computer programme itself [...]'. (AI₄) '[...] clear instructions in the organisational unit itself'. (AI₆) '[...] Strict routing of non-urgent patients to the personal doctor of choice'. (AI₇)
			Teamwork	'I think we are quite a good team in the collective, [...]. As a whole, I think we work very well together. I think it's essential that we work together'. (AI₆)
			Working environment	'[...] triage becomes a very unpleasant and uncomfortable working environment'. (AI₄) '[...] better arranged premises—quicker accessibility of consultation with doctors'. (AI₅)

(Continues)

TABLE 6 (Continued)

Results of QUAN study		Data integration pillar			Findings of the QUAL study
1	2	3	2	1	1
The results refer to the respondents' satisfaction with the provision of safety in the triage process.	The lowest level of satisfaction is highlighted within 'safety assured' ($\bar{x} = 2.88/5$; $SD = 0.992$). Differences in satisfaction with the method of patient handover from the field by ambulance teams were found, specifically TNs with less than 3 years of experience have higher satisfaction rating with the field handover of the patient compared with the more senior colleagues ($U = 763.000$; $p > .005$).	Safety is key	Violence against employees Organization Safety of patient handover		'With disagreements between certain doctors on the level of urgency (triage colour) and too many patients'. (AI₂) 'If, for whatever reason, the waiting time for treatment is prolonged, [...], the patients become irritable, nervous, rude, violent'. (AI₄) 'Poor safety organisation for both triage nurses and patients'. (AI₅) '[...] regarding threats, we call the security service and write adverse events. All this affects the quality of the triage process'. (AI₈) 'Poor handover of patients by ambulance teams Either over the telephone [...] with poorly completed ambulance intervention protocols'. (AI₆)
The results relate to job satisfaction in triage and its weaknesses.	TNs most frequently cited high patient flow or frequency ($N = 22$), insufficient pay in relation to triage job responsibilities ($N = 20$), stress ($N = 18$) and leaving triage and handing patients over to emergency centre work sites ($N = 15$) as the most common disadvantages of working in triage. Statistically significant differences were found for TNs with more than 3 years of experience, who felt more stressed in triage compared with younger TNs ($U = 379.00$, $p ≤ .001*$).	Burdening circumstances	Stress Overwork Organizational deficiencies		'I dislike triage work since it is stressful for me'. (AI₂) 'Overload with work itself or demanding patients [...]'. (AI₄) '[...] stress due to huge influx of patients, work overload'. (AI₅) 'To do administration work for which I am not sufficiently qualified. This is a major problem in triage'. (AI₁) 'Not to mention the fact that we record ECG of everyone who has chest pain, which is not the job of the TN at all'. (AI₄)
The data refer to the capability of TNs.	Higher self-reported professional capability was achieved by TNs with more than 3 years of experience, and the Mann–Whitney test showed statistically significant differences in satisfaction within the domain 'psychological empowerment' ($U = 570.00$; $p < .05$). According to the respondents, the TNs should have adequate professional capability ($\bar{x} = 4.68/5$; $SD = 0.550$), have completed a triage course ($\bar{x} = 5.42/6$; $SD = 0.840$) and have a sufficient range of experience ($\bar{x} = 5.71$; $SD = 0.539$).	Capability	Definition of professional capability of TNs:		'Good professional development and capability means greater professionalism, quality, and safety in their work'. (AI₄) '[...] to be proficient in all working areas of the emergency centre [...]'. (AI₅) 'Professional capability, in my opinion, means work experience and having completed a triage course'. (AI₆)

RIGHTS LINK

T A B L E 6 (Continued)

Results of QUAN study		Data integration pillar		Findings of the QUAL study
1	**2**	**3**	**2**	**1**
The data represent the strengths and satisfaction of triage nurses in performing triage work.	TNs consider their work interesting ($N = 93$, 95.5%) and varied ($N = 97$, 100%). TNs reported as the advantages of working in triage that the work was varied, flexible and interesting ($N = 28$), that they gained additional theoretical knowledge ($N = 26$), that they gained experience ($N = 21$) and that they had less physical work ($N = 20$).	Self-evaluation	Triage work	'I do not like working in triage. I much prefer working in the observation room'. (AI_6) 'I like working in triage [...]. Working in triage has given me a lot of theoretical knowledge [...]'. (AI_1) 'Yes, this work is interesting and varied, you learn a lot, you get to know a lot and it's always dynamic'. (AI_8)
	The majority of TNs feel confident in making triage decisions ($\bar{x} = 4.99/6$; $SD = 0.757$) and also estimate to have a sufficient level of autonomy ($\bar{x} = 4.73/6$; $SD = 1.005$). TNs with more than 3 years of triage experience enjoy triaging patients more compared with younger colleagues ($U = 485.00$; $p = .002*$) and would also like to be called to triage more often ($U = 785.00$; $p = .003*$).		Self-esteem	'[...] I do not feel any fear in triage, just more confidence and determination regarding my knowledge'. (AI_1) '[...] a confident triage nurse, trusting in her knowledge, independent in triage, flexible, ethical, communicative and organised'. (AI_5)
			General self-efficacy	'I notice in myself that toward the end of the working day I am already finding it difficult to listen and formulate meaningful sentences in triage'. (AI_7)

$*p \leq .05$.

TN8: 'The triage nurse must have the skills of observation and recognition, patience, the ability to adapt, [...] be critical of any problem that affects patients'.

TN9: 'Professional training should begin with at least five years of work in an emergency department, anaesthesia, and intensive care units. TN should have completed some professional courses (such as Advanced Life Support, Advanced Trauma Life Support, etc.) and communication skills. TN should be able to handle all the work areas of the emergency department'.

Clinical capability to work safely in triage requires the nurse to know emergency conditions and interventions, professional theoretical knowledge, years of experience working with life-threatened patients and completed training in triage. The TN should be familiar with the organization of all the workplaces in the emergency department.

3.6 | Integration

Using the pillar integration process, we identified six main pillars of integration of TN satisfaction in relation to professional capability. These are (1) characteristics and traits, (2) work organization, (3) safety is key, (4) burdening circumstances, (5) capability and (6) self-evaluation. The process of integrating the qualitative and quantitative parts of the study is shown in Table 6.

3.6.1 | Pillar 1 of integration: Characteristics and traits

TN needs to possess expected characteristics and traits that focus on individual and interpersonal characteristics such as conscientious and precise performance, respect for the dignity of the patient and his/her relatives and cooperation with the rest of the team in providing appropriate health care. In addition, the TN repeatedly highlighted the attribute of inner feeling and unconscious perception, that is, intuition, which can often help them identify a potential problem or predict a potential deterioration in a patient's condition.

3.6.2 | Pillar 2 of integration: Work organization

TN states that one of the main factors affecting job satisfaction is a pleasant working environment, satisfying relationships and successful teamwork. TNs are satisfied with the collaboration and the relationship with their superiors and therefore rate the working environment as friendly. Furthermore, TN expressed a need for some improvements in the organization system, such as more TNs, clearer work instructions and competence to refer non-urgent patients to the personal physician, more time for triage, reorganization of the computer programme and a permanent physical presence of the physician for consultations.

3.6.3 | Pillar 3 of integration: Safety is key

TN highlighted the problem of ensuring safety for themselves and caring for patients. TNs stated that they are often victims of verbal, psychological and physical violence inflicted by patients or their companions. Due to the poor responsiveness and effectiveness of security service, TN feels endangered and concerned.

In addition, TN mentioned the problem of superficial handed information about the patient's condition over the phone and later at the triage desk by paramedics. Satisfaction with how paramedics announce patients varies among TNs depending on years of working experience in triage. The results show that TNs with more than 3 years of triage experience are less satisfied with how paramedics handover patients compared with their younger colleagues.

3.6.4 | Pillar 4 of integration: Burdening circumstances

It was found that TNs are reluctant to do triage work because they feel overloaded, under great mental and physical pressure and forced to carry out administrative work and register patients. Moreover, TN listed debilitating physical factors affecting their concentration in the triage workplace, such as high patient flow, leaving triage and handover of patients to physicians in different workplaces in the emergency department. The physical and psychological overload of TN further exposes them to stress and reduces their interest in working in triage. TNs stated that they are reluctant to do triage and do not want to do it more often, as they feel overwhelmed when doing the triage work. Younger TNs with less than 3 years of experience feel more stressed while working in triage.

3.6.5 | Pillar 5 of integration: Capability

The results show that the professional capability of a TN requires a completed triage course, work experience, a wide range of knowledge, communication skills, intuition and mastery of work in all workplaces of the emergency department. Nevertheless, TN agrees that triage requires a wide range of expertise, knowledge, skills and expertise that can only be achieved through work experience. Our study confirmed that work experience is an inevitable part of quality, safe and trustworthy triage.

3.6.6 | Pillar 6 of integration: Self-evaluation

The final theme or pillar was 'self-evaluation'. TNs find their work interesting, varied and flexible. Most TN feels independent, confident in their knowledge and confident in their decision-making with a sufficient level of autonomy. Despite the strenuous, demanding and responsible nature of the work, as pointed out by the TN, the majority

of them still affirm they are proud to be a nurse and want to stay in their profession.

4 | DISCUSSION

We aimed to investigate the factors related to job satisfaction and professional capability of TN in the clinical setting. Based on the process of integration in our study, we identified the main factors that are related to job satisfaction and professional capability: (1) characteristics and traits, (2) work organization, (3) safety is key, (4) burdening circumstances, (5) capability and (6) self-evaluation.

TNs in our study emphasized their job satisfaction and professional capability contributed to higher patient safety and quality triage care. Triage is a complex process requiring TNs to make daily decisions regarding assigning clinical priority to patients with life-threatening conditions. Simultaneously, they have to judge and consider available resources to optimize the provision of safe and quality patient care in the emergency department. Similarly, other researchers pointed out that the TN is expected to prioritize patients appropriately, in a suitable timeline, to provide health care education when needed and to ensure a safe environment for the patients and employees in the waiting room and throughout the emergency department (Aloyce et al., 2014; Bijani et al., 2020; Cotič Anderle & Bračko, 2019; Ebrahimi et al., 2016; Olofinbiyi et al., 2020). A survey conducted in Slovenia showed that nurses believe that at least 2–10 years of work experience is needed to perform triage activities effectively (Cotič-Anderle, 2011). Similar conclusions were also reached in foreign studies, which cite at least 3 years of work in emergency nursing as a prerequisite for safe and successful triage (Duko et al., 2019; Sutriningsih et al., 2020).

Triage represents the area in the emergency department where the patient's medical treatment begins; therefore, the TN plays an important role in categorizing patients according to the established level of urgency (Sánchez-Salmerón et al., 2022). Consequently, TNs are under great psychological and physical pressure due to the large daily flow of patients in the emergency department and the responsibility they assume with their work, which is also highlighted by our study. Similarly, Källberg et al. (2017) point out that TNs often feel stressed and pressured, unsure or worried about their decision on a particular priority. Within the aggravating circumstances, we identified three key stressors in the triage process: stress, overload and organizational deficiencies. Nevertheless, the TNs see their work as interesting, varied and flexible. Most TNs feel independent, confident in their knowledge, self-assured in their decision-making and feel they have sufficient autonomy to do so. Sutriningsih et al. (2020) also point out that TNs should have a wide range of expertise, judgement, adaptability, objectivity, work experience and critical decision-making. Job satisfaction is one indicator that determines individuals' attitudes toward their professional life (Suárez et al., 2017). Our study found that TN's job satisfaction is influenced by years of experience in triage, the working environment, interpersonal relations, teamwork, workload, commitment and having a varied, flexible and interesting job with the

possibility of autonomous decision-making. Concerning the impact of job satisfaction on nurses' work, Hayes et al. (2010) point out that older nurses with an average working life of 20 years are generally more satisfied with their pay and work schedule compared with younger colleagues. Similarly, we found higher levels of satisfaction in TN with more seniority in triage and professionally more capable nurses. This suggests that older TNs with longer triage experience are more satisfied than their young colleagues in their workplace. Bijani et al. (2018) established that more skilled and experienced nurses are more confident in their decisions, are more familiar with their colleagues and the workplace organization process and ultimately feel less stress and pressure in their work.

Likewise, we found that the professional capability of TN is related to their satisfaction in triage encounters, as we found moderate positive correlations between the domains of nurse satisfaction and the domains of professional capability. In our case, professional capability explained 43.6% of the total variance in TN job satisfaction. It was found that there is a medium linear correlation between TN satisfaction and all domains of professional capability (i.e. capability, psychological empowerment, and commitment). Therefore, the professional capability of TN is also highly correlated with the level of TN satisfaction scores. Consequently, we can conclude that TN with a broader range of competences, stronger psychological empowerment and a higher level of commitment are also more likely to have higher job satisfaction. In this context, the association with a higher level of satisfaction is also more pronounced in nurses with a broader range of experience and professional capabilities. On this basis, it can be confirmed that higher scores on the evaluated satisfaction factors are proportionally related to the professional capability of TN, which is in line with the findings of Wurgler et al. (2014) and Lee et al. (2014). Namely, Wurgler et al. (2014) found that higher job satisfaction scores were also dependent on the competencies and capability of the employees, while the study by Lee et al. (2014) found strong positive correlations between job satisfaction and the professional capability of nurses. The study results by Francis (2015) confirm that the higher professional capability of employees has a proportionate impact on the level of job satisfaction. In line with the findings of various studies (Lopez et al., 2014; Wurgler et al., 2014), our study confirmed that positive job satisfaction scores are a frequent consequence of higher levels of professional capability. Our study conducted among TNs confirms that TN with a broader range of competences, stronger psychological empowerment and higher levels of work commitment will also have higher job satisfaction.

5 | STUDY LIMITATIONS

The strength of this study was the high response rate (88.1%) for completion of the survey and the use of a mixed method, which allowed us to collect quantitative and qualitative data for a more comprehensive understanding of the research topic. The sequential mixed-method approach is time-consuming due to the separate phases of data collection, but the richness of obtained data makes this

approach appropriate. Implementation and integration of the quantitative and qualitative studies have been challenging due to the lack of examples in the existing literature or style guides to help in this process. The main limitation in the quantitative part was the selective research environment because, due to the current problem of COVID-19, not all operating emergency rooms in Slovenia were included in the research. Therefore, the study does not represent the results of the entire population of Slovenian TNs, which limits the generalizability of our results. Participants are more likely to give socially desirable answers when self-reporting. To minimize this limitation, we assured participants of their confidentiality and ensured that only anonymized data would be reported in all publications. The lack of theoretical evidence and sources was also a complicating factor for the study, as the topic of nurse satisfaction in relation to triage capability is still limited in the literature. Because various instruments to measure job satisfaction and professional capability have been used and no such study was done in nursing, at some points, it was not easy to compare our findings with those from foreign and similar studies. To minimize the appearance of this limitation, we compared the results from our study, when possible, with those from studies that used the same questionnaires for data collection. A further limitation of this study is that the sample was at only one location and at a single point in time. The study also did not examine potential changes in TN job satisfaction and professional capability over time and compare results to previous. At the same time, we are aware that the data obtained give only a rough idea of the current problem situation, so it would be helpful to repeat and expand to the whole population of TN worldwide.

Despite these limitations, the study is worthy of attention, as it is the first to compare TN job satisfaction with professional capability and to highlight the importance of professional capability for higher satisfaction among the triage nursing workforce in Slovenia.

6 | CONCLUSIONS

The results provide insight into the current state of job satisfaction and its related impact factors in one of the most physically and mentally demanding jobs in the emergency departments—triage. This type of research has not yet been conducted at a global level, although triage work is well known to be very stressful and, last but not least, is already well established worldwide. We have found that the job satisfaction of the TN is related to professional capability. TN gave higher job satisfaction ratings in line with higher ratings of professional capability. Therefore, we can conclude that sufficiently trained TNs will be more satisfied with their job and provide safe patient health care. Patient safety depends on the TN's ability to make safe and accurate decisions in a timely manner. Despite the diversity of the emergency field, TN often feels physically threatened, overwhelmed, stressed and under great psychological pressure from supervising doctors, rudeness and disrespect from patients and their relatives. If nurses are not sufficiently satisfied, they will be more

likely to leave their workplace or even profession, or contrary, they will be less efficient, indisposed and bad-tempered. The need for adequately educated and professionally trained TN will increase in the coming years due to the ageing population and chronic diseases. Therefore, satisfied TNs need a pleasant working environment, good interpersonal relationships and cooperative teamwork. The level of job satisfaction among TNs is affected by a list of different satisfaction factors, including organizational factors, interpersonal characteristics of an individual, self-evaluation score and burdening circumstances. There are good basics for further research of factors affecting job satisfaction in emergency nurses, especially TN, and enabling better working conditions for TN.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

The findings of our mixed-method study confirm that job satisfaction is a multidimensional concept and needs to be handled using adaptable, diverse and professional methods to maintain job satisfaction among TNs. Our findings have a significant role in practical implications for management in emergency departments in favour of triage nursing employees. The critical issue for nursing managers is to be aware of the job satisfaction level of TN in the emergency department. In the case of low satisfaction levels, managers must determine how job satisfaction can be improved. Therefore, an unsatisfied TN represents a danger to herself, especially to the patient, as it is not entirely focused on triage patients and decision-making and may neglect, underestimate or dismiss the patient's symptoms and problems. A significant problem for patient safety is the lack of motivation of TN to work, overload or uncontrollably stressful situations. All these factors cause low job satisfaction scores and can also lead to errors in the triage process and put the patient's life at risk. Nursing managers have a key role in creating a positive working environment and achieving higher job satisfaction. Like other countries, the Slovenian health care system faces a critical shortage of health care personnel, especially sufficiently professionally qualified and competent personnel with sufficient work experience. The problem of dissatisfaction TN tends to lead to staff movement to other jobs, mostly other service activities outside the nursing profession. Results of our mixed-method study expose TN dissatisfaction with satisfaction factors, such as lack of nurses, stress, overload, organizational deficiencies and provided security. To achieve satisfactory and sustainable effects on job satisfaction, the operational management and hospital organization need to improve working conditions by providing a safe environment for their employees, changing TN with another TN when they feel overwhelmed, providing psychological support and ensuring an adequate number of trained TN.

Although organizational factors related to job satisfaction workplace represent the responsibility of nurse managers primarily; on the other hand, employees should be aware that it is also their responsibility to maintain a positive working atmosphere, good interpersonal relationships and successful teamwork, which is a vital factor

influencing job satisfaction. The results of our study can serve as a foundation for further studies in the area of job satisfaction and professional capability.

CONFLICT OF INTEREST

The authors have declared no conflict of interest.

ETHICAL CONSIDERATION

Ethical approval has been obtained from the Ethics Committee University of Maribor Faculty of Health Sciences (No. 04/8R-2021).

SUBMISSION DECLARATION

This study has not been published before.

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DATA AVAILABILITY STATEMENT

Additional data from this study are not publicly available in order to maintain the anonymity of participants but can be provided on request.

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ORIGINAL ARTICLE

WILEY

Gender awareness is also nurses' business: Measuring sensitivity and role ideology towards patients

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Abstract

Aim: This study aims to validate the Nijmegen Gender Awareness in Medicine Scale, which assesses gender sensitivity and gender-role ideology towards patients in the Spanish language for use among physicians and nurses.

Background: Women are more likely to suffer pain, delays and health consequences related to low therapeutic effort. Health professionals' gender awareness may minimize such bias; however, the only instrument to assess such awareness is limited to physicians and lacks a Spanish version.

Methods: After using the back-translation method, a sample of 167 Spanish nurses and nursing students completed the instrument. In order to obtain additional validity evidence, 98 health professionals filled in gender sensitivity and gender-role ideology towards patients' subscales and the short versions of the Ambivalent Sexism Inventory.

Results: Gender-role ideology towards patients correlated strongly with sexist attitudes, demonstrating convergent validity, and Cronbach's alpha coefficients showed an adequate internal consistency.

Conclusions: Nijmegen Gender Awareness in Medicine Scale perfectly applies to nurse population, and this adaptation also broadens its use for Spanish professionals.

Implications for Nursing Management: Nurse managers and educators can use this applicable tool to treat low gender awareness levels as a modifiable risk factor and promote a gender-sensitive caring culture.

KEYWORDS
adaptation, gender awareness, nursing, questionnaire, validity

1 | BACKGROUND

The discriminatory practices induced by values, rules and thoughts in healthcare increase mortality and morbidity worldwide (Shannon et al., 2019). Despite universality, equality and equity health policies established at the national and international levels, gender significantly influenced healthcare resources' use and access (Ruiz-Cantero et al., 2019). Gender inequalities have been evidenced in different care levels worldwide, including in the so-called developed world (Alspach, 2017). For instance, in Spain, women showed 13.6% higher waiting times for diagnosis visits than men (Abásolo et al., 2014). Both Swedish and American women with severe sepsis or septic shock experienced longer delays to initial antibiotics in the emergency department compared to men (Madsen & Napoli, 2014; Sunden-Cullberg et al., 2020), and females were more likely than males to be diagnosed with advanced stage of bladder cancer in England (Carney et al., 2020). Besides, severely injured women were less likely to be transported to trauma centres than their male counterparts in Canada and New York (Gomez et al., 2012; Scheetz & Orazem, 2020).

On this point, the need for gender equity education in the nursing profession is currently recognized, as well as the need for nurses to detect the potential impact of unconscious biases and practices that contribute to patients' discrimination (American Nurses Association, 2019; Tzeng et al., 2011). To this end, validated instruments are required to detect such gender biases. In this sense, the gender awareness level of healthcare providers comprises a construct that may explain the underlying cause of lower therapeutic efforts towards women. Gender awareness includes two main components. On the one hand, gender sensitivity refers to the ability and willingness to understand and take account of the social and cultural factors involved in gender-based exclusion and discrimination and their impact on health services delivery. On the other hand, gender-role ideology towards patients involves the healthcare worker relying on negative gender stereotypes about patients when performing clinical assessments (Salgado et al., 2002; Verdonk et al., 2009).

Starting from this premise, gender awareness was first measured by the Gender Awareness Inventory—Veterans Administration (GAI-VA; Salgado et al., 2002). Some years later, Verdonk et al. (2008) created the Nijmegen Gender Awareness in Medicine Scale (N-GAMS) with 14 items measuring gender sensitivity (GS), 11 items measuring gender-role ideology towards patients (GRI-patient) and eight items measuring gender-role ideology towards doctors (GRI-doctors).

The N-GAMS has shown reliability and replicability among Dutch, Swedish, Swiss and Portuguese populations (Andersson et al., 2012; Morais et al., 2020; Rrustemi et al., 2020; Verdonk et al., 2008). However, this scale is aimed at medical students and physicians, ignoring the impact of other health professionals' gender awareness in healthcare delivery. In this regard, Tekkas et al. (2020) found high levels of sexism among both Turkish and South Korean nursing students, and other studies have found gender discrimination in nursing care. In Jordanian addiction rehabilitation centres, Daibes et al. (2017) found that nurses' attitudes towards females with addictions were less tolerant than towards males. According to a multicentre study in Australia, nurses less often allocated urgent triage categories to women with acute coronary syndrome, and female patients waited longer for their first electrocardiograph (Kuhn et al., 2017). Regarding pain management, Wandner et al. (2014) showed that using virtual patient cases, nurses and physicians rated women's pain as less intense and resisted administering more opioid drugs to females, which was exceptionally high among nurses. Taking these data into account, and considering that the N-GAMS seems to be perfectly applicable to nursing practice, nurse professionals should not be omitted when approaching gender equity in health. The availability of validated instruments to study nurses' awareness of gender inequalities in health is essential to assess the overall impact of policies that ensure equal access to the healthcare system in the future.

In addition, the potential of gender sensitivity and gender-role ideology towards patients' subscales as indicators of the risk of gender-biased therapeutic effort towards patients should be emphasized. Both subscales measure health professionals' attitudes towards male and female patients, and, interestingly, Morais et al. (2020) have recently found an association between gender sensitivity, gender-role ideology towards patients and Ambivalent Sexism Inventory in the Portuguese population. The Ambivalent Sexism Inventory (Glick & Fiske, 1996) has demonstrated its capacity to measure sexism in different populations and predict behaviour and attitudes. For instance, Ovejero et al. (2013) found that children with high punctuations on sexism performed more bullying behaviours. Ibabe et al. (2016) found that ambivalent sexism among young men and women was positively associated with the perpetration of violence and victimization in their dating relationships. The inventory has also predicted more tolerant attitudes towards wife abuse among police officers and judiciary members (Gölge et al., 2016).

Thus, the present work aimed to adapt and validate the N-GAMS for the Spanish population. Furthermore, in order to expand the population and make a valid adaptation not only for physicians and medical students but also for nurses and nursing students, in this adaptation, we have decided to adapt the original wording. Therefore, in this adaptation, the term 'physicians' has been changed to 'health professionals'.

2 | METHODS

2.1 | Study 1

The aim of Study 1 was to adapt the N-GAMS to the Spanish nursing staff population and analyse its psychometric properties.

2.1.1 | Participants

A convenience sample of 167 Spanish nursing students and professionals was used in this study. Specifically, we contacted three different populations: nursing students that were in their last year ($N = 95$), registered nurses that were enrolled in master's studies ($N = 29$) and nursing assistants ($N = 43$). They ranged in age from 18 to 63 years ($M = 30.70$; $SD = 13.40$), and the significant majority, 92.8%, were female. This difference in the participants' gender reflects the reality of this profession in Spain. Indeed, according to the National Institute of Statistics, 52.377 male and 278.368 female nursing graduates were registered in nursing associations in 2021 (National Institute of Statistics, 2021).

Considering that we have 32 indicators and three dimensions in our study and expect high factor loadings of at least .50, we estimated that a minimum sample size of 50 participants would be sufficient. In this sense, a study aiming to analyse the minimum sample size requirements of the robust weighted least squares estimator concluded that samples of 50 people would be sufficient for an instrument with 10 indicators with factor weights of 0.70 and samples of 100 people for the same number of indicators but with factor weights of 0.40 (Moshagen & Musch, 2014). However, to increase the sample's representativeness, we decided to increase the sample size to at least 150 participants.

2.1.2 | Instruments

The *N-GAMS* (Verdonk et al., 2008) is a self-report questionnaire that assesses gender awareness in healthcare. It includes 32 items to be answered on a 5-point Likert scale with options ranging from *totally disagree* to *totally agree*. The items are grouped in three dimensions. Fourteen items assess gender sensitivity (GS), which focuses on healthcare professional attitudes towards gender concerns in healthcare (i.e. 'Physicians' knowledge of gender differences in illness and health increases the quality of care'). Gender-role ideology towards patients (GRI-patient) aimed to measure gender-stereotypical thinking about patients through 11 items (i.e. 'Female patients compared to male patients have unreasonable expectations of physicians'). Gender-role ideology towards doctors (GRI-doctors) aimed to assess gender-stereotypical thinking about physicians through seven items (i.e. 'male physicians are more efficient than female physicians').

A higher score on the gender sensitivity subscale indicates more gender sensitivity, while a higher score on the gender-role ideology towards patients and the gender-role ideology towards doctors subscales implies agreeing more with gender stereotypes. In this study, we applied the Spanish version that was in the process of adaptation, which contains the same number of items and uses the same response format as the original N-GAMS. In addition, as we aimed to make a valid adaptation not only for physicians and medical students but also for nursing staff, in this adaptation, we changed the original term 'physicians' to the broader term 'health professionals'. A

short questionnaire designed to gather sociodemographic information complemented this instrument.

2.1.3 | Procedure

The NGAMS was adapted for use in the Spanish language in the health professional population (hereinafter, the S-NGAMS) following the International Test Commission Guidelines for Translating and Adapting Tests. Concretely, the original N-GAMS items were translated using a forward–backward design to detect potential problems associated with poor translations (Balluerka et al., 2007; Muñiz et al., 2013). Two bilingual researchers translated each item into Spanish, and then the two translations were compared and discussed until a consensus was reached regarding the wording of each item. Another two bilingual researchers did the back-translation, and again they compared their translations until they reached a consensus. This translation was examined and compared to the original wording to determine whether the items had the same meaning. If necessary, the wording of items in Spanish was revised and modified to ensure suitability for the target population (see the Spanish version of the items in Table S1). The instruments were administered online and were anonymous (the target population received a generic link), and it took a maximum of 15 min to complete them.

2.1.4 | Data analysis

We began by conducting an item analysis to determine each item's mean score, standard deviation and corrected item-total correlations. There were no missing data because we forced the respondents to answer all the items. Confirmatory factor analysis (CFA) was performed with weighted least squares means and variance adjusted (WLSMV) method to examine whether the factor structure of the Spanish health professional's version was consistent with that of the original instrument. Goodness of fit was assessed by means of the comparative fit index (CFI), the Tucker–Lewis index (TLI) and the root mean square error of approximation (RMSEA). In the case of the CFI and TLI, values above .90 and .95 indicate acceptable and excellent fit, respectively. For the RMSEA, values below .08 indicate acceptable fit, and those below .06 indicate a good fit (Hu & Bentler, 1999). Internal consistency was assessed by calculating Cronbach's alpha coefficient for each dimension. We used Mplus for the CFA and SPSS for all other analyses.

2.2 | Study 2

The main objective of this second study was to obtain additional validity evidence of the gender-role towards patients subscale of the S-NGAMS developed in Study 1. Thus, we analysed convergent validity and provided additional evidence of internal consistency

and structure for two subscales (gender sensitivity and gender-role ideology towards patients) in a different sample.

2.2.1 | Participants

In this second study, we focused mainly on health professionals. However, we also admitted nursing students that were at least in their third year and had a minimum of 950 h of clinical experience. Regarding the inclusion criteria for health professionals, they had to be part of the workforce of nurses and physicians from an outpatient or inpatient care unit of a healthcare centre and have at least 1 year of working experience. The study comprised a total of 98 participants, of which 79 (80.6%) were health professionals (81.1% nurses and 18.9% doctors) and 19 (19.4%) were nursing students. Their ages ranged from 20 to 63 years (M = 30.57; SD = 9.89), and most of the sample was female (86.7% women, 12.3% men and 1.0% no binary). Health professionals had a mean working experience of 8.5 years (minimum 1, maximum 40).

Considering that the version of the NGMAS used in this study has two dimensions with more than 10 indicators per factor, and that we expected high factor loadings (<.50), we estimated that we needed a minimum sample size of 50 participants (Moshagen & Musch, 2014).

2.2.2 | Instruments

The data collection instruments included a demographic data form (sex, nationality, age and working experience) and three questionnaires. The first questionnaire comprises the gender sensitivity and the gender-role ideology towards patients subscales of the S-NGAMS developed in Study 1. The other two questionnaires were the short forms of the Ambivalent Sexism Inventory towards Women (ASI) and the Ambivalent Sexism Inventory towards Men (AMI) (Spanish adaptation of those short forms by Rodríguez et al., 2009).

Spanish adaptation of The Nijmegen Gender Awareness in Medicine Scale (S-NGAMS). Although the original scale has three dimensions assessing gender sensitivity (GS), gender-role ideology towards patients (GRI-patient) and gender-role ideology towards doctors (GRI-doctors), in this second study, we have used only the first two of those three dimensions. Thus, the self-report measure we used includes 25 items to be answered on a 5-point Likert scale (1 = *totally disagree* to 5 = *totally agree*). The gender sensitivity subscale includes 14 items focusing on healthcare professional attitudes towards gender concerns in healthcare, and the gender-role ideology towards patients subscale includes 11 items aimed at measuring gender-stereotypical thinking about patients. A higher score on the gender sensitivity subscale indicates more gender sensitivity, and a higher score on the gender-role ideology towards patients subscale implies agreeing more with gender stereotypes.

Short form of the Ambivalent Sexism Inventory towards Women (S-ASI; Spanish validation by Rodríguez et al., 2009). This short form comprises 12 items with a 6-point Likert-type response scale ranging from 0 (*totally disagree*) to 5 (*totally agree*). Half of the items assess hostile sexism towards women (HS), and the other half, benevolent sexism towards women (BS). The psychometric properties of the short version of the ASI in Spanish were adequate (Rodríguez et al., 2009). The present study observed the following internal consistency indices: HS α = .88, BS α = .80 and ASI α = .90.

Short form of the Ambivalence Inventory towards Men (S-AMI; Spanish validation by Rodríguez et al., 2009). This short form is also composed of 12 items that assess ambivalent attitudes towards men. Half of the items assess hostility towards men (HM), and the other half, benevolence towards men (BM). The psychometric properties of the short version of the AMI in Spanish were adequate (Rodríguez et al., 2009). The present study observed the following internal consistency indices: HM α = .84, BM α = .73 and AMI α = .87.

2.2.3 | Procedure

Regarding data collection, health professionals and nursing students were invited to collaborate on a study about gender issues in healthcare. As in Study 1, the instruments were administered online, participation was voluntary, and responses were anonymized and treated confidentially. This study was part of a larger study; therefore, the protocol included some additional tools not described in the present paper.

2.2.4 | Data analysis

To assess the convergent validity of the S-NGAMS questionnaire, we examined the relation with two related variables—ambivalent sexism towards women (S-ASI) and ambivalent sexism towards men (S-AMI)—using Spearman correlation coefficients. The effect size interpretations for the correlation coefficients are reported according to the recommendations from Davis (1971): ≤0.29 (low association), 0.3–0.49 (moderate association), 0.5–0.69 (substantial association) and ≥0.7 (very strong association). CFA was used to test the factorial validity of the original model. As in Study 1, we used weighted least square means and WLSMV for ordered categorical data. Reliability was analysed using Cronbach's alpha coefficient. The pairwise deletion was used to handle missing data, and CFA analyses were done with Mplus, while the other analyses were done with SPSS.

2.3 | Ethical considerations

The research received a favourable report from the Clinical Research Ethics Committee of the Basque Country (ref. no.: PI2019152) and

the Ethical Committee of the University of the Basque Country University (ref. no.: M10_2019_139).

3 | RESULTS

3.1 | Study 1

Table 1 shows the means, standard deviations, homogeneity indices, factor loadings for each item and Cronbach's alpha coefficient for each dimension. The means varied depending on the items' dimension, and the highest values corresponded to the *gender sensitivity* dimension. The homogeneity index (corrected item-total correlation) was above .30 for almost all the items (the sole exception being items GS1 with $r = .25$ and GS13 with $r = .22$). Finally, with respect to the factor structure, we can conclude that the model fit was acceptable $[\chi^2(461) = 717.50;$ RMSEA $= 0.058$, IC 90% [.049, .066]; CFI $= 0.933$; TLI $= 0.928]$ (see Figure S1), and standardized factor loadings of each item in its corresponding factor were above .40 for all the items except again the item GS13 with a factor loading of .34. Regarding the correlations among subscales, as expected, both gender-role ideology scales were strongly and positively correlated among them ($r = .82$; $p < .001$), whereas gender sensitivity was negatively and less strongly correlated with gender-role ideology towards patients and gender-role ideology towards doctors ($r = -.18$; $p = .010$; and $r = -0.14$; $p = .081$), respectively. Finally, internal consistency indices ranged between .79 and .89, with the lower value corresponding to the dimension with fewer items (gender-role ideology towards doctors with seven items).

3.2 | Study 2

With respect to internal structure, the results of the CFA indicated an acceptable fit $[\chi^2(274) = 377,651;$ RMSEA $= 0.061$, IC 90% [.046, .077]; CFI $= 0.938$; TLI $= 0.932]$ (see Figure S2). As expected, the correlation between both subscales (gender sensitivity and gender-role ideology towards patients) was negative and had a small effect size $r = -.13$ ($p = .207$).

Regarding convergent validity, as shown in Table 2, the analysis confirmed a positive relationship between gender-role ideology towards patients and all the scales and subscales of sexism analysed in the study. All these relationships were positive, statistically significant and of moderate magnitude. Besides, gender sensitivity was not related to sexism.

Finally, regarding reliability, Cronbach's alpha coefficients were calculated for each of the two subscales of the S-NGAMS, and they showed an adequate internal consistency (gender sensitivity subscale $\alpha = .80$ and gender-role ideology towards patients $\alpha = .89$) (see Table 3).

4 | DISCUSSION

The main strength of this study consists in the broader utility conferred to the N-GAMS. Indeed, gender awareness towards patients can now be evaluated in Spanish- or English-speaking nurses, physicians and nursing or medicine students worldwide. This could facilitate international study reports and measure the effectiveness of global gender plans in the mindset of health professionals.

Regarding the adaptation and validation analyses of the N-GAMS for the Spanish population, the instrument's psychometric properties were adequate. In the same sense, the internal structure and reliability of the instrument were adequate.

The results of the CFA in this first study support the theoretical dimensions of the N-GAMS, confirming the original three-factor structure. The internal consistency indices, item homogeneity and factor loadings were also adequate, except for item GS13. The values of this last item were not as good as the other items, but we decided to maintain the item because eliminating items would affect the reliability and the validity of the test, and one of the objectives of test adaptation is to guarantee cross-cultural comparison. In this case, the overall values were adequate, so we believe that the S-NGAMS is psychometrically valid for assessing gender sensitivity and gender-role ideology of Spanish health professionals.

Regarding convergent validity, as we expected, hostile (HS) and benevolent sexism (BS) were highly and positively correlated with gender-role ideology towards patients, but not with gender sensitivity. Those results are in line with the ones Morais et al. (2020) obtained in the Portuguese adaptation of the instrument. That study only analysed the relationship between gender-role ideology and ASI. In our study, we have further analysed the relationship between ambivalent sexism and gender-role ideology by adding the AMI scale, and we have concluded that the results are similar. Overall, it can be concluded that gender-role ideologies represent stereotypical views towards patients, and those stereotypes are related to ambivalent sexism towards women and men.

Moreover, we have maintained all the original items in the Spanish adaptation, so we believe that the content validity of the questionnaire is guaranteed. Content validity refers to the extent to which the items in a questionnaire represent the entire theoretical construct the questionnaire is designed to assess (Shultz et al., 2014). In some of the previous research done with the N-GAMS (Andersson et al., 2012; Morais et al., 2020; Rrustemi et al., 2020), not all the items of the questionnaire have been maintained (i.e. the authors did some factor analysis and decided to maintain the items with higher loadings). Although this can be done to keep good psychometric properties, changes in validated and published scales should be made with caution since it can result in an instrument that measures something different from the validated scale from which it was produced. Moreover, this can be a problem regarding content validity and scores comparability.

TABLE 1 Mean, standard deviation, item-total correlation and factor loadings for each item of the S-NGAMS

S-NGAMS	M	SD	r	Loadings
GS. Gender sensitivity ($\alpha = .87$)				
GS1. Addressing differences between men and women creates inequity in healthcare (R)	3.60	1.31	**.25**	.495
GS2. Physicians' knowledge of gender differences in illness and health increases quality of care	4.32	1.13	.33	.501
GS3. Physicians should only address biological differences between men and women (R)	3.54	1.63	.60	.726
GS4. In non-sex-specific health disorders the sex/gender of the patient is irrelevant (R)	2.74	1.60	.58	.690
GS5. A physician should confine as much as possible to medical aspects of health complaints of men and women (R)	3.37	1.56	.64	.727
GS6. Physicians do not need to know what happens in the lives of men and women to be able to deliver medical care (R)	3.76	1.33	.63	.664
GS7. Differences between male and female physicians are too small to be relevant (R)	3.43	1.43	.58	.756
GS8. Especially because men and women are different, physicians should treat everybody the same (R)	2.46	1.45	.56	.674
GS9. Physicians who address gender differences are not dealing with the important issues (R)	3.69	1.31	.47	.586
GS10. In communicating with patients it does not matter to a physician whether the patients are men or women (R)	2.03	1.37	.56	.791
GS11. In communicating with patients it does not matter whether the physician is a man or a woman (R)	1.83	1.20	.48	.728
GS12. Differences between male and female patients are so small that physicians can hardly take them into account (R)	3.48	1.27	.70	.795
GS13. For effective treatment, physicians should address gender differences in aetiology and consequences of disease	3.98	1.08	**.22**	.340
GS14. It is not necessary to consider gender differences in presentation of complaints (R)	3.29	1.54	.66	.791
GRI-patient. Gender-role ideology towards patients ($\alpha = .89$)				
GRI-P1. Male patients better understand the approach of physicians than female patients	1.30	0.70	.46	.726
GRI-P2. Female patients compared to male patients have unreasonable expectations of physicians	1.43	0.81	.59	.818
GRI-P3. Women more frequently than men want to discuss problems with physicians that do not belong in the consultation room	2.24	1.29	.67	.765
GRI-P4. Women expect too much emotional support from physicians	2.15	1.25	.64	.742
GRI-P5. Male patients are less demanding than female patients	1.74	1.04	.69	.795
GRI-P6. Women are larger consumers of healthcare than is actually needed	1.63	1.06	.68	.828
GRI-P7. Men do not go to a physician for harmless health problems	2.22	1.32	.62	.686
GRI-P8. Medically unexplained symptoms develop in women because they lament too much about their health	1.48	0.90	.72	.881

(Continues)

TABLE 1 (Continued)

S-NGAMS	M	SD	r	Loadings
GRI-P9. Female patients complain about their health because they need more attention than male patients	1.43	0.88	.65	.777
GRI-P10. It is easier to find causes of health complaints in men because men communicate in a direct way	1.62	.98	.69	.808
GRI-P11. Men appeal to healthcare more often with problems they should have prevented	2.60	1.39	.51	.619
GRI-doctor. Gender-role ideology towards doctors (α = .79)				
GRI-D1. Male physicians put too much emphasis on technical aspects of medicine compared to female physicians	2.17	1.22	.55	.762
GRI-D2. Female physicians extend their consultations too much compared to male physicians	1.69	0.98	.63	.806
GRI-D3. Male physicians are more efficient than female physicians	1.18	0.54	.54	.892
GRI-D4. Female physicians are more empathic than male physicians	2.40	1.38	.45	.538
GRI-D5. Female physicians needlessly take into account how a patient experiences disease	1.69	1.02	.48	.647
GRI-D6. Male physicians are better able to deal with the work than female physicians	1.13	0.46	.55	.948
GRI-D7. Female physicians are too emotionally involved with their patients	1.82	1.05	.56	.741

Note: (R): reverse items; r = corrected item-total correlation.

TABLE 2 Spearman correlations between S-NGAMS subscales and ambivalent sexism scales

		S-ASI			S-AMI		
		HS	BS	ASI	HM	BM	AMI
GS	rho	−.14	−.05	−.11	−.01	−.04	−.01
	p	.203	.659	.303	.971	.695	.990
GRI-patient	rho	.35	.36	.37	.33	.30	.37
	p	.001	.001	<.001	.002	.004	<.001

Abbreviations: AMI, ambivalence towards men; ASI, ambivalent sexism towards women; BM, benevolence towards men; BS, benevolent sexism towards women; GRI-patients, gender role ideology towards patients; GS, gender sensitivity; HM, hostility towards men; HS, hostile sexism towards women; S-AMI, Short form of the Ambivalence Inventory towards Men; S-ASI, Short form of the Ambivalent Sexism Inventory towards Women.

5 | IMPLICATIONS FOR NURSING MANAGEMENT

Notably, the N-GAMS has not previously been applied to nurses. This fact may paradoxically reflect gender bias within the study of gender bias in health since nursing is considered one of the most feminized professions, and such representation may be related to the omission of nurses as active health assets in research and management (Galbany-Estragués & Comas-d'Argemir, 2017; Ortega, 2019). In this regard, this work provides for the first time an easy-to-use and applicable tool to measure gender awareness for nursing managers, the S-NGAMS. Considering the growing importance of nursing in the context of health systems, nursing managers should promote gender-sensitive caring cultures to educate nurses. Undoubtedly, each health worker can minimize gender inequities by addressing sexist stereotypes that can affect her/his care delivery process.

At organizational level, the gender sensitivity and the gender-role ideology towards patients subscales allow measuring the gender awareness level of health professionals in clinical settings, and nurse managers should treat low gender awareness levels as a modifiable risk factor for health inequities. This approach may facilitate the establishment of specific strategies to guarantee equal adherence to established standards of care for all patients.

Notwithstanding, the World Health Organization (2006) established the curricula to provide academic institutions with adequate preparation concerning the gender perspective in 2006 since health

TABLE 3 Mean, standard deviation, item-total correlation and factor loadings for each item of the S-NGAMS

S-NGAMS	M	SD	r	Loadings
GS. Gender sensitivity (α = .80)				
GS1. Addressing differences between men and women creates inequity in healthcare (R)	2.37	1.47	−.07	.093
GS2. Physicians' knowledge of gender differences in illness and health increases quality of care	4.21	1.13	.31	.469
GS3. Physicians should only address biological differences between men and women (R)	3.75	1.47	.46	.614
GS4. In non-sex-specific health disorders the sex/gender of the patient is irrelevant (R)	2.99	1.55	.57	.711
GS5. A physician should confine as much as possible to medical aspects of health complaints of men and women (R)	3.34	1.63	.51	.587
GS6. Physicians do not need to know what happens in the lives of men and women to be able to deliver medical care (R)	4.28	1.13	.32	.387
GS7. Differences between male and female physicians are too small to be relevant (R)	3.27	1.33	.31	.437
GS8. Especially because men and women are different, physicians should treat everybody the same (R)	2.29	1.38	.41	.587
GS9. Physicians who address gender differences are not dealing with the important issues (R)	3.67	1.27	.30	.444
GS10. In communicating with patients it does not matter to a physician whether the patients are men or women (R)	2.20	1.45	.55	.826
GS11. In communicating with patients it does not matter whether the physician is a man or a woman (R)	1.78	1.14	.52	.715
GS12. Differences between male and female patients are so small that physicians can hardly take them into account (R)	3.54	1.27	.60	.703
GS13. For effective treatment, physicians should address gender differences in aetiology and consequences of disease	4.00	1.13	**.26**	.417
GS14. It is not necessary to consider gender differences in presentation of complaints (R)	3.33	1.46	.62	.762
GRI-patient. Gender-role ideology towards patients (α = .89)				
GRI-P1. Male patients better understand the approach of physicians than female patients	1.24	0.54	.52	.653
GRI-P2. Female patients compared to male patients have unreasonable expectations of physicians	1.45	0.87	.52	.764
GRI-P3. Women more frequently than men want to discuss problems with physicians that do not belong in the consultation room	2.09	1.27	.77	.876
GRI-P4. Women expect too much emotional support from physicians	2.14	1.21	.72	.827
GRI-P5. Male patients are less demanding than female patients	1.74	1.10	.67	.795
GRI-P6. Women are larger consumers of healthcare than is actually needed	1.46	0.86	.73	.898
GRI-P7. Men do not go to a physician for harmless health problems	1.78	1.12	.51	.675
GRI-P8. Medically unexplained symptoms develop in women because they lament too much about their health	1.35	0.71	.59	.771

(Continues)

TABLE 3 (Continued)

S-NGAMS	M	SD	r	Loadings
GRI-P9. Female patients complain about their health because they need more attention than male patients	1.30	0.70	.55	.773
GRI-P10. It is easier to find causes of health complaints in men because men communicate in a direct way	1.56	0.93	.68	.827
GRI-P11. Men appeal to healthcare more often with problems they should have prevented	2.39	1.25	.60	.731

Note: (R): reverse items; r = corrected item-total correlation.

professionals who do not obtain such training could perpetuate gender bias in healthcare (Ruiz-Cantero et al., 2019). In this context, the internalization of the N-GAMS scale may be useful for nurse educators to ascertain appropriate gender perspectives among nursing students of different countries.

6 | CONCLUSIONS

We conclude that the S-NGAMS is a valid and reliable self-report questionnaire that assesses the attitudinal component of healthcare students' and professionals' gender awareness. The valid assessment of gender awareness in this field can be an important topic to achieve healthcare equity, so we believe this adaptation can help research in this domain.

7 | LIMITATIONS OF THE STUDY

Although our sample was quite heterogeneous, and we have replicated some analyses in two different samples, the sample size in both studies can be considered a limitation, so future studies should be done to further validate this version of the questionnaire. Additionally, the translation may need slight variations if it aims to be applied to the American Spanish-speaking population.

CONFLICT OF INTEREST
The authors have no conflicts of interest to report.

ETHICS STATEMENT
This research has been approved by the Ethics Committee for research with human beings of the University of Basque Country (CEISH UPV/EHU) (ref. no.: M10_2019_139) and the Clinical Research Ethics Committee of the Basque Country (ref. no.: PI2019152).

AUTHOR CONTRIBUTIONS
Study design: AL, EP, JP, JA, SP. Data collection: AL, JA, SP. Data analysis: JA, AL, SP. Study supervision: AL. Manuscript writing: JA, OG, AL, SP. Critical revisions for important intellectual content: AL, SP, JA, OG, EP.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

ORIGINAL ARTICLE

WILEY

Nurses and the doctorate: A mixed study in French health care organizations

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Abstract

Aim: This research aims to understand the place and role of nurses holding a PhD or PhD students (nurse doctor [ND]/nurse doctoral students [NDS]) in health care organizations in France.

Context: Worldwide, many nurses are undertaking doctoral studies. France is no exception. However, in France, there is no doctorate dedicated to nursing. The question of ND/NDS integration into health organizations is thus raised in a specific manner.

Methods: We used a two-stage mixed methodology. The first stage used data from questionnaires that were sent to 165 ND/NDS in France. To contextualize issues raised by these data, we used qualitative methods which comprised 45 semi-structured interviews with nurses, 10 interviews with health managers and chief nurses and 27 h of in situ observations with research coordinators.

Results: Seventy-nine participants (47.9% response rate) completed questionnaires. The data showed that work organization in some departments—intensive care units (ICUs), oncology and psychiatry—favoured the development of scientific expertise among nurses. Favourable elements promoting the professional and academic development of ND/NDS included the potential for medical teaching in healthcare services, participation in research projects and, most importantly, medical proximity. Conversely, our data also identified poor visibility and recognition of nursing doctoral courses in French health organizations: A lack of task missions, a lack of suitable posts and poor integration into the nursing profession. Currently, French nurses define their profession as providing direct care to patients and their families—yet this definition fails to consider other important professional elements, such as research.

Conclusions: Our study identified how proper ND/NDS integration is important to health care organizations. We identified key organization factors facilitating the integration of ND/NDS, such as participating in research teams and providing research support management.

Implications for Nursing Management: In recent years, the nursing profession has significantly evolved. We are interested in the impact of these changes in work organizations following the development of new scientific skills. Our study investigates all aspects of the nursing profession (teaching, practice, research and organizations). Our study advocates managerial roles, among others, to improve ND and NDS integration into work organizations. We directly observed work organizations that helped develop nursing research. Our study is also aimed at managers who have roles as decision-makers in promoting and facilitating research and nurse researchers.

1 | INTRODUCTION

For several decades, the number of nurses enrolling in doctoral programs has increased globally. The literature has provided comprehensive descriptions of nurses (and profiles) who have embarked on doctoral paths particularly in North America (American Association of Colleges of Nursing, n.d.; Brant, 2015; Broome et al., 2016; Edwards et al., 2018; Fang et al., 2016; Fitzpatrick & McCarthy, 2014; Grimes Stanfill et al., 2019; Rice, 2016; Trautman et al., 2018). This body of work has dissected the motivation driving academic nursing careers (Fang et al., 2016) and the impact of doctorates on patient care (Broome & Corazzini, 2016; National Academies of Sciences Engineering, and Medicine, 2021). However, to our knowledge, no study has investigated PhD or PhD students (nurse doctor [ND]/nurse doctoral student [NDS]) from a French managerial perspective, thereby questioning their integration into health care organizations.

Nurse training is a major issue. Historically and currently, the United States remains a pioneer in nurse doctoral training (Rice, 2016). In 2018, 136 doctoral schools in the US (Trautman et al., 2018). The ND represents 2% of the 4 million of nurses (American Association of Colleges of Nursing, n.d.). In France, although nurses are undertaking doctorates in other disciplines, no university courses exist for their training.

Although France has fallen behind the 'academicization' of the nursing profession, in recent years, processes have accelerated. Importantly, a range of legislative frameworks and hospital policies are in place to encourage more nurses to undertake research (Circulaire n°DHOS/MOPRC/RH1/2009/299, 2009; Décret n°2002-482, 2002; Décret n°2019-1107, 2019; Ministère de la Santé, 2016). Different decrees and reports have provided a valuable rethink of nurse training by integrating university methods for several teaching units (Décret n°2002-482, 2002). This approach has formalized the teaching of introductory research courses as part of initial training and continued research training for specialties and health managers. One key element of the legislative framework is the establishment of research programs, starting with Nursing in 2010 and 2011 (Circulaire n°DHOS/MOPRC/RH1/2009/299, 2009). These programs financed research projects for nurses or non-medical caregivers. In 2019, the creation of a university nursing department was mooted in the legislative framework (Décret n°2019-1107, 2019). For the first time, it permitted the appointment of nursing science teachers in France. However, no nursing departments exist at any universities. Study courses (bachelor's, master's and doctorate) are not organized due to a lack of teachers and structuring. Since 2009, initial nursing training was validated by a State diploma (authorized by the French State) and a Bachelor's degree (authorized by medical faculties) (Table 1). University recognition encourages more nurses to pursue academic training up to doctorate stages. Thus, in the absence of a university nursing curriculum, French nurses enrol in other scientific disciplines (Policard, 2020) to explore research themes linked to clinical and/or educational activities.

In the absence of dedicated funding, nurses must maintain professional activities in parallel with their studies, unlike other doctoral students who are generally younger and are 100% involved in their thesis work. In the past 10 years, several French studies addressed the development of nursing research (Debout et al., 2010; Lecordier et al., 2016), but these publications failed to promote the integration of nurse researchers and doctoral education for nurses. Associations and professional chairs are now calling for the formalization of nursing doctoral programs.

2 | BACKGROUND

This work was realized in an inductive approach. Our data encouraged us to use the following two concepts:

The concept of activity is from managerial theories (Allen, 2014), as well as what is sometimes understood as nursing work, that is, the tasks that comprise nursing care from a curative, preventive, educational and scientific perspective. The notion of research activity was not just for ND/NDS, but for all nurses holistically following the various works of Allen (2014) and Michel et al. (2017).

The research activity was also part of a broader view of the notion of nursing work. This echoed the work organizations and integration of this activity but also recognized the different relational dynamics that defined this work (Met & Waelli, 2020).

TABLE 1 Evolution of nursing education in France

EVOLUTION OF NURSING EDUCATION IN FRANCE

Table 1.

1882

Dr. Bourneville, influenced by the experience of Florence Nightingale, creates a lay nursing school.

1959

First nursing school in University hospitals

1965

International School of Higher Nursing Education (Lyon)
It closed in 1995

1983

Creation of the Nursing Research Association (ARSI)

1985

The journal Nursing Research (The first)
(Recherche en soins infirmiers : RSI)

1992

State diploma for nurses. Specialties are created

2009

Partial universitarization of the training
(Bachelor degree's)

2011

Hospital program for nursing and paramedical research (Ministry of Health)
first research program dedicated to funding healthcare research

2018

MASTER in Advanced Practice
(state diploma for advanced practice nurses)

2019

Creation of qualification sections of the National Council of Universities in nursing; Academic training

2022

Today, Bachelor's, Master's, Doctorate is not implemented

These managerial elements impacted the definition of nursing activity and its involvement in research.

The second concept is a 'learning' organization as described by Amy Edmondson (Edmondson, 2012). She identifies a supportive managerial environment with a management system, fostering research activity and supporting ND/NDS careers.

The author describes four actions that characterize 'learning' organizations:

- Action 1 'Frame the situation for learning'
- Action 2 'Make it psychologically safe to team'
- Action 3 'Learn to learn from failure'
- Action 4 'Span occupational and cultural boundaries'

From the context, we asked ourselves the following questions: What are the working relationships nurses have with collaborating colleagues, physicians and supervisors? And also, what is their position, and what help do they get in health organizations?

The main objective of this research was to understand the place and experience of ND/NDS in healthcare organizations.

Specific objectives:

- To understand, through biographical journeys, the elements that trigger doctoral processes at the work organization level.
- To identify organizational resources for NDS to allow them conduct their research and integrate with their other activities.
- To characterize the working relationships ND/NDS have with peers, colleagues and management.

3 | METHODOLOGY

The study was based on a two-stage mixed methodology and was conducted between November 2018 and December 2020.

3.1 | Population

We focused on ND and NDS working in France. There is no doctoral school of nursing in France. ND/NDS students enrol in different academic disciplines (education, sociology, psychology, public health and management). This population is fragmented between different academic disciplines, and similarly, there is no register of registered nurses (RNs) holding doctorates in France. Two previous studies reported a growing number of nurses undertaking doctoral studies in France; 26 doctoral students and 28 doctors were identified in 2009 (Jovic & Isambart, 2010) and 131 NDs since 1976 (Policard, 2020). We identified current ND/NDS through professional contacts of the principal investigator (PI) (NM) and RésiDoc listings (a ND/NDS association). Then, a snowball effect (Vincent & Thompson, 2022) helped us identify others, and we mapped these French ND/NDS by looking beyond contacts and listed ND/NDS. Additionally, we explored

TABLE 2 Correlation matrix for past/present perspectives

	1.	2.	3.	4.	5.	6.
1. My colleagues in the department where I work or worked encouraged me to do a PhD.	—					
2. Professors or doctors in the health care unit where I work or worked encouraged me to do a PhD.	0.07	—				
3. My line manager where I work or worked encouraged me to do a PhD.	0.28*	0.02	—			
4. Have my colleagues been a resource for me during my PhD (from the beginning of the project until now)?	0.66***	0.32*	0.57***	—		
5. Has my line manager been a resource for me during my PhD (from the beginning of the project until now)?	0.34**	0.23	0.67***	0.61***	—	
6. Has my line manager (N + 2) been a resource for me during my PhD (from the beginning of the project until now)?	0.16	0.01	0.23	0.11	0.17	—
7. Has the care manager (hospital or nursing school) been a resource for me during my PhD (from the beginning of the project until now)?	0.05	−0.16	0.15	−0.06	0.19	0.66***
8. Has my head of department been a resource during my PhD (from the beginning of the project until now)?	0.31*	0.80***	0.36*	0.63***	0.30	0.17
9. Have doctors been a resource for me during my PhD (from the beginning of the project until now)?	0.18	0.45***	0.14	0.34*	0.25	−0.10
10. Have friends and family been a resource for me during my PhD (from the beginning of the project until now)?	0.10	−0.13	−0.16	0.03	−0.07	0.36**
11. Did my colleagues have any reaction when I announced my intention to do a PhD?	0.10	0.19	0.06	0.25	0.23	0.11
12. Did my line manager have any reaction when I announced my intention to do a PhD?	0.30*	0.04	0.54***	0.32*	0.38**	0.11
Mean ± Standard deviation	2.49 ± 1.50	2.43 ± 1.63	2.55 ± 1.73	2.39 ± 1.52	1.88 ± 1.40	1.89 ± 1.41

Note: Average age = 47.82 years (48 years); 77% female; 33% male; standard deviation = 9.75; variance = 93.65; 4.6 years of professional experience.

*$p < .05$.
**$p < .01$.
***$p < .001$.

TABLE 2 (Continued)

	7.	8.	9.	10.	11.	12
1. My colleagues in the department where I work or worked encouraged me to do a PhD.						
2. Professors or doctors in the health care unit where I work or worked encouraged me to do a PhD.						
3. My line manager where I work or worked encouraged me to do a PhD.						
4. Have my colleagues been a resource for me during my PhD (from the beginning of the project until now)?						
5. Has my line manager been a resource for me during my PhD (from the beginning of the project until now)?						
6. Has my line manager (N + 2) been a resource for me during my PhD (from the beginning of the project until now)?						
7. Has the care manager (hospital or nursing school) been a resource for me during my PhD (from the beginning of the project until now)?	—					
8. Has my head of department been a resource during my PhD (from the beginning of the project until now)?	−0.07	—				
9. Have doctors been a resource for me during my PhD (from the beginning of the project until now)?	−0.08	0.69***	—			
10. Have friends and family been a resource for me during my PhD (from the beginning of the project until now)?	0.08	0.05	−0.08	—		
11. Did my colleagues have any reaction when I announced my intention to do a PhD?	−0.05	0.31	0.27	0.20	—	
12. Did my line manager have any reaction when I announced my intention to do a PhD?	0.07	0.37*	0.10	−0.12	0.27*	—
Mean ± Standard deviation	1.82 ± 1.25	1.86 1.49	2.56 ± 1.71	3.81 ± 1.39	2.87 ± 1.37	2.83 ± 1.56

Note: Average age = 47.82 years (48 years); 77% female; 33% male; standard deviation = 9.75; variance = 93.65; 4.6 years of professional experience.
*$p < .05$.
**$p < .01$.
***$p < .001$.

TABLE 3 Correlation matrix for future perspectives

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. The PhD will or does help me develop my professional practice.	—								
2. The PhD will or does help me develop the team practice.	0.31**	—							
3. The PhD will or does help me improve my social status.	0.37**	0.36**	—						
4. The PhD will or does provide me with financial recognition.	0.36**	0.41***	0.60***	—					
5. The PhD will or does serve to enhance the value of nursing.	0.27*	0.40***	0.35**	0.19	—				
6. In the future, armed with my PhD, I would like to find employment as a research coordinator.	−0.27*	0.01	−0.02	−0.13	−0.08	—			
7. In the future, armed with my PhD, I would like to work in a dual position (University/Hospital).	0.02	0.24*	0.11	0.05	0.17	0.23	—		
8. In the future, armed with my PhD, I would like to take up a teaching-research position.	0.19	0.03	0.12	0.13	0.18	0.03	0.03	—	
9. Armed with my PhD, I wish to return or have returned to my original post.	−0.12	0.13	−0.11	−0.04	−0.03	0.10	−0.16	−0.29*	—
Mean ± Standard deviation	3.83 ± 1.38	3.44 ± 1.39	2.72 ± 1.50	2.08 ± 1.42	3.64 ± 1.38	2.10 ± 1.45	3.49 ± 1.45	3.38 ± 1.54	3.10 ± 1.64

*$p < .05$.
**$p < .01$.
***$p < .001$.

Linkedin® pages and scoured nursing research seminar and congress programs to locate unidentified ND/NDS. In France in 2020, we identified 201 ND/NDS (65 PhDs; 136 PhDs) out of 722,572 nurses (Insee, 2021). In the United States, nurse PhDs represent (Trautman et al., 2018) nearly 2% of 4 million nurses (American Association of Colleges of Nursing, n.d.).

3.2 | Data collection

The study was based on the results of a questionnaire sent to the selected population. Then, to clarify issues from questionnaire data, we analysed data from semi-structured interviews.

3.2.1 | Stage 1: Questionnaire

The questionnaire was sent to 165 ND/NDS who were pre-identified by mapping. Nurses could respond anonymously via the Framaform© platform.

Questions were designed to meet our secondary objectives.
The questionnaire grid collected the following elements:

- Academic background
- Professional experience
- Motivation to do a doctorate
- Work relations (collaborator and management)
- Job openings in the future

3.2.2 | Stage 2: Qualitative study

Semi-structured interviews and observations from paramedical research coordinators were conducted in different regions of France at teaching hospitals and a private establishment. Interviews were conducted until the data were saturated.

Participant recruitment was performed via direct contact and PI networks. Then, via the snowball effect (Vincent & Thompson, 2022), other ND/NDS were identified and asked to participate in interviews. Interviews with health officials and chief nurses were also conducted. These job profiles were selected due to their important roles as resources in ND/NDS activities.

The interview grid consisted of 42 questions (Tables 2 and 3).

Interviews were complemented by 27 h of shadowing (McDonald, 2005) paramedical research coordinators. Most were nurses who promoted and supported research projects by non-medical staff in hospitals. Importantly, some interviewees were neither studying for, nor held a PhD. We selected structures which promoted paramedical research—including one institution that had specific budgets for paramedical research. The observations of the research coordinators allowed us to observe the integration of research activity with nurses. The role of the coordinators is to accompany the paramedical teams in carrying out research projects. Research coordinator profiles were very interesting because hospitals primarily recruited nurses with doctorates for these positions; their role was to integrate research into health organizations. Structured note-taking was conducted during observations (Dacos & Mounier, 2010) to preserve key moments during shadowing (McDonald, 2005) and interviews. Notes helped the researcher retrace stories and cross-check information at analysis.

3.3 | Data analysis

Empirical investigations were punctuated by iterative reference to the literature which allowed us identify themes for analysis and were based on the Howard Becker inductive approach (Becker, 2002).

3.3.1 | Stage 1

Because questionnaires were mainly exploratory and provided leads for further exploration in the qualitative section of the study, analyses mainly consisted of descriptive statistics (numbers and proportions related to categorical responses and means and standard deviations of responses expressed on a Likert scale). Correlations (and *p* values) were calculated between different items to estimate relationships between reported phenomena and participant expectations. Analyses were conducted in R software.

3.3.2 | Stage 2

Interviews were recorded and transcribed, and thematic analyses from interviews and observations were conducted. We applied interpretive coding based on issues highlighted by Step 1, for example, motivational aspects, professional experience and work relationship dynamics. Different data triangulation (interviews with nurses, managers and other professionals) was performed to highlight variations in perspective.

3.4 | Ethical issues

As this study relates to professional practices and not patients, it did not require ethics committee approval in France (as in many countries) (Loi Jarde n°2012-300, 2012). However, the project was validated for methodological and ethical vigour by colleagues in the School of Advanced Studies in Public Health. They checked that the usual ethical rules, such as informing participants and anonymizing interviews, were respected. No personal data were collected. Additionally, we voluntarily requested a review of the research protocol by the ethics committee of the hospital where the first author worked. This committee approved our research.

However, such studies may require administrative authorization from some establishments, which we obtained. All institutions and

study participants were informed of the research, and permission and consent (oral or written) were attained. We were committed to protecting the confidentiality and anonymity of respondents and services.

4 | RESULTS

4.1 | Non-homogeneous profiles

Seventy-nine individuals completed questionnaires, and 45 interviews of 88 min average duration were conducted. Questionnaire analyses identify a typology of French ND/NDS, which was a significant minority of the total nurse population in France. The average age of respondents was 48 years (Table 2) when compared with 45 years at the national level (Direction de la Recherche, des Etudes, de l'Evaluation et des Statistiques [DREES], 2022). Thirty-three percent (Table 2) of the ND/NDS population were men, but they represented only 13.4% (DREES, 2022) of RNs in France. This was similar to other professions and reflected men's elevation in the nursing hierarchy. It also suggested it was easier for men to access a doctorate. In comparison, male nurse anaesthetists represented 31% (Circulaire DHOS/SDO n°2003-413, 2003) of the total population. These figures did not allow us to hypothesize clear assumptions on PhD accessibility for men. This observation agreed with Williams (1992) who demonstrated the advantages men experienced in advancing in predominantly female professions.

On average, our ND/NDS cohort had on average 4.6 years professional experience (Table 2), ranging from 1 year for one ND/NDS to 32 years for four participants but who were retired and remained active in research and teaching. However, nurse researcher age indicated a younger enrolment status at the PhD level in recent years.

Mapping (Figure 1) made it possible to identify different practices. Mapping showed that ND/NDS worked mostly in large teaching hospitals, including 31 ND/NDS at the Assistance Publique des Hôpitaux de Paris (APHP). In addition to health care, the APHP focused on research and innovation and had its own research foundation.

ND/NDs were based in several scientific disciplines, but our results identified two main disciplinary trends. One trend showed a doctoral orientation group from the applied sciences; the vast majority of which were in the education sciences (30%). Indeed, 'universitarization' (entry of nursing education into the university, now partial) has created this need for doctoral education among this category of nurses. The other group was mainly composed of young ND/NDS (average age 25) with little experience (1 to 5 years of experience). This group of young nurse researchers were enrolled primarily in public health doctoral schools.

4.2 | Care units for learning: The doctor as a motivational lever

Some organizations are favourable to research activity. We have seen that the proximity of the medical professions correlates with the organization of work on certain care units, which are levers for ND/NDS. 'Spending 12 hours (of work) with the doctor brings it closer' (A., ND/NDS).

First, intensive care units (ICUs) contained the highest number of ND/NDS who either worked or were working (29%) there. Like psychiatric departments (25%) and oncology departments (19%), ICUs organized care work to reinforce proximity between doctors and nurses.

> With a monitoring we see the patient all the time. And we can go to training. Some nurses even came in on their day off to attend this training, because it interested them. Either training courses or knowledge updates. Given by a doctor, head of department, manager or one of the nurses who had read something or

FIGURE 1 Cartography DNDs in France

wanted to share and discuss it with everyone. A bit of a practice exchange. And everyone, or almost everyone, came out happy. (F., ND/NDS)

These care units have many converging points, notably care organization. Monitoring patients by remote cardiac rhythm monitoring via remote screens allowed teams to attend courses and clinical meetings organized by doctors. These institutionalized medical classes were open to nurses. Mortality/morbidity reviews and feedback committees were integrated into units' organizations. These spaces, which allowed for practice and learning exchange, benefited care teams.This professional (ND/NDS) sharing created a sense of collaboration and identification with the medical profession. According to ND/NDS statements, these departments promoted considerable medical research. Doctors encouraged ND/NDS to participate in research and co-present at conferences. During interviews, ND/NDS described doctors as resources for PhD projects and how they made available financial and scientific support. By training and accompanying ND/NDS to conferences, doctors were often the first to identify the potential and/or desire to conduct research in ND/NDS.

> Clearly, had I not come across Professor R, I wouldn't have gone into research and probably wouldn't have done a PhD afterwards. The fact that he involved me in his research and asked me to present at conferences made me want to do it. (D., ND/NDS)

These care units integrated research projects into their care organization.

> There is one unit that has created a research group dedicated to paramedics, with the support of the head of the department. A research group dedicated to paramedics. [...] There were nursing assistants and nurses integrated into this group. It was not strictly closed, only for nurses. The paramedical team, orderlies, nurses were invited to the research project that concerned our patients. (G., ND/NDs)

It appeared that ND/NDS recognized assistance from the medical profession—medical support for ND/NDS was real lever; however, ND/NDS sought the same power as doctors. In terms of expectations (Table 2), some ND/NDS believed that a PhD could provide a new status (M = 3.44[1]), whereas for others, it was about developing nursing through research activities (M = 3.49).The majority of ND/NDS (62%) had research experience before their nurse training; 18/49 participants were enrolled in medical school for 1 or 2 years before nurse training. This result corroborated the discourse of the ND/NDS on the influence of the medical profession on entry to the doctorate.

> So, I did a year of medicine. No, two! And ... Nursing was Plan B.

We hypothesized that medical training prior to nursing training encouraged ND/NDS to model and idealize the medical profession. This modelling will be reflected in research themes.

4.3 | Integration into professional groups: Making room for research activity

The decision to do a PhD was part of a personal trajectory. Unlike students with traditional academic backgrounds, ND/NDS did not always get funding, with 68% holding down jobs during their thesis.

Some ND/NDS felt isolated during their endeavours and were out of step with their colleagues. The vast majority (Table 2) did not feel encouraged (M = 2.87) by their peers during their PhD studies.

> I do not think they understand what I do, or they do not care at all. They're not interested, to them it's a nerd thing. (F., ND/NDs)

Like physicians, supervisors were identified by most ND/NDS as supportive, whereas managers were not supportive (M = 1.82). These results highlighted solitary ND/NDS patterns.

Although not directly involved in patient care, ND/NDS felt that a PhD could help them develop their professional practice and that of their colleagues (M = 3.83).

ND/NDS hoped to have the same status as physicians; they sought both research and teaching activity in the university and hospital.

Currently, lecturer positions require ND/NDS to leave the nursing profession and integrate into new posts, far removed from patient care. For ND/NDS, becoming a researcher meant mourning the nursing profession.

> At the same time, I was leaving caregiving completely. Even though I still liked it. And at the same time, there were other things I wanted. (J., ND/NDS)

Several ND/NDS indicated that their new roles as researchers no longer allowed them to wear the gown, to have offices in the care units (they are located in the administrative parts of the establishments), to no longer discuss care with colleagues and, above all, to no longer treat patients.To maintain ties with the nursing profession, they adopted several strategies; they were more likely to be involved in projects strongly rooted in clinical care, participate in advanced practice nursing education and/or become activists for the nursing discipline.

4.4 | The development of new scientific skills

ND/NDS considered their new scientific skills as evolutionary steps in professional nursing practice (M = 3.83). Paradoxically, they had little or no ambition to increase their salary (M = 2.08) or status (M = 2.72)

after obtaining a PhD. Their ambition was to pursue hospital-based activities within the nursing profession, while also retaining university ties. This dual status (M = 3.49) reflected the medical model and was considered by ND/NDS to be the best configuration. Two career options were available to ND/NDS: One was to work in the hospital as a 'coordinator' in paramedical research. The other was to pursue an academic career as a 'teacher-researcher' (M = 3.38). Nursing is not yet established at the university level in France; academic positions are few and far between, and career development in hospitals is easier.

> So far, they have not offered me a post. Because my post is being replaced. And the person has been hired on a permanent basis. So I cannot go back to my previous post. I do not know how it's going to go when I'm done. (F., ND/NDS)

F. is a third year PhD student. Although funded by her employer, she has no prospect of integration, with only a few months before the end of her thesis.

5 | DISCUSSION

We explored ND/NDS experiences in French health care organizations and identified an important gap between the institutional willingness to promote research in nursing and the reality of work organization in a French context. These results build on our previous research and highlight the difficult working relationships of ND/NDS (Met & Waelli, 2020). Our previous study showed an ambiguous relationship between ND/NDS and doctors, tensions with managers and difficulties integrating with non-research nurse colleagues.

5.1 | The learning organization: A positive element in ND/NDS pathways

ND/NDS career paths often emerged in ICU, oncology and psychiatry departments, which brought together several four actions that characterized learning organizations (Edmondson, 2012).

Action 1 'Frame the situation for learning': The aforementioned services allowed nurses to attend physician-led courses and multidisciplinary team meetings. This dynamic situation facilitated different knowledge inputs (Edmondson, 2012), as described by the nurses when attending medically organized classes.

Action 2 'Make it psychologically safe to team': The technical demands in these services require a working atmosphere where everyone can express their doubts, questions and wishes (Edmondson, 2012). ND/NDS describe patient monitoring equipment that allows for participation in research activities and promotes a safe working atmosphere. The physician/nurse pairing (which is close in departments such as ICU, ER or OR) allows for more horizontal communication. Leadership influences the organization of work; research introduces cross-functional approaches to team management practices.

Action 3 'Learn to learn from failure': During interviews, most ND/NDS mentioned the impact of incentives and financial and scientific resources from the medical professions, which could be used to mitigate possible failures in ND/NDS research.

This individualized support and guidance provided ND/NDS with the confidence to implement their own research projects. Both ICU and psychiatric wards regularly conducted mortality/morbidity reviews and professional practice assessments, which gave everyone a voice.

As described by one ND/NDS, care units and equipment are at the service of learning organizations. The tele-transmission of critical patient data in ICU allowed nurses to participate in practice analysis times. In care units, this culture was still in its infancy, but time spent analysing professional practices helped research projects emerge and reflect on the organization of care.

Action 4 'Span occupational and cultural boundaries': As presented in the results, the supportive organization allows each team member to participate in scientific endeavours—whether in courses or research projects—to dynamically unite the teams. The collaborative and interdisciplinary aspects of the knowledge sharing moments encourage multidisciplinary teams to contribute to common projects, such as research projects.

5.2 | Research as a satellite nursing activity

Nursing tasks are diverse, and many are little known or poorly understood. Allen (2014) estimated that 60% of nursing activities were 'invisible' as historically, the nurse's role was exclusively bedside-based. Visible work, which is formal work, is therefore authorized and a documented activity (Hughes, 1996). Nursing work is exemplified by belonging to a group, wearing gowns and preparing care (especially technical), time of transmission of information around the patient. These were elements the ND/NDs no longer shared, or shared too little of. Currently, medical, technological and legal advances are moving nurses away from direct care. These transformations call into question the integration of certain activities into 'nursing mandates'—with research being one. ND/NDS used several strategies to compensate for the remoteness caused by this nursing mandate; they maintained either a care activity or a thesis subject directly related to patient care.

Recent research highlighting 'administrative' work levels in nursing activities has suggested that the nursing mandate is also restructuring health care organizations (Michel et al., 2017) and that the integration of invisible activities is mostly a managerial issue.

For nursing management, the challenge is to use health care management to initiate organizational reflection which draws out and fully acknowledges all nursing role aspects across all care establishments (Michel et al., 2017).

6 | CONCLUSIONS

Currently, France is developing nurse training so as to offer university courses up to doctorate levels. Our study, from a nursing management perspective, identified how important correct ND/NDS integration was to health care organizations. Our results highlighted the positive influence of learning organizations, and we invite health care organizations to implement them. The approach must encompass the nursing mandate so that professional groups integrate all nursing activities, such as research.

We propose the following recommendations to facilitate ND/NDS integration:

From organizational perspectives,

- Organize care to allow nurses participate in research. This is possible with remote monitoring that allows nurses attend training and seminars on care services, in order to facilitate interdisciplinary research projects,
- Legislate for nurse ratios to facilitate nurse availability for cross-sectional activities such as research,
- Integrate research activity into professional nursing practice, education, and management,
- Value work practices through the implementation of care protocols derived from ND/NDS theses, and
- Encourage evidence-based nursing.

7 | IMPLICATION FOR NURSING MANAGEMENT

We investigated all aspects of the nursing profession from teaching, practice, research and organizations. The nursing profession has evolved significantly in recent years.

We are interested in the impact on work organizations following the development of new scientific skills. This work advocates managerial reflections on how care units can act favourably towards nursing careers in research. Our study not only identified the pivotal role of managers in avoiding obstacles and promoting research activity for doctoral nurses but also the nursing profession outside doctoral perspectives.

Improved integration of research activities by the nursing profession requires:

- A collective awareness of the importance of this activity,
- Strengthened research training for managers, particularly in France,
- Incentives for managers to organize their working hours so as to integrate research activities and promote nurse scientific careers.

These elements must be accompanied by the implementation of learning organizations as described in our research.

CONFLICT OF INTEREST
All authors declare no conflict of interest.

ETHICS STATEMENT
In France (as in many countries), this type of study, which relates to professional practice and does not involve patients, does not require the approval of an ethics committee (Loi Jarde n°2012-300 du 5 mars 2012 relative aux recherches impliquant la personne humaine. www.legifrance.gouv.fr). However, the thesis project was first validated by the teachers of the School of Advanced Studies in Public Health (EHESP) for the methodological and ethical aspects. They checked that the usual ethical rules such as informing participants and anonymizing interviews were respected. No personal data was collected. In addition, we requested, on a voluntary basis, the review of the research protocol by the ethics committee of the hospital (where the first author works), which also approved our research.

However, such studies may require administrative authorization from the establishments concerned, which we have obtained. All institutions and study participants were informed of the research, and permission and consent (oral or written) were sought. We are committed to protecting the confidentiality and anonymity of respondents and services.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ENDNOTE
[1] Average (M) was calculated from a Likert scale, scoring 1–5.

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WILEY

How do ethically competent nurses behave in clinical nursing practice? A qualitative study

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Abstract

Aim: This study explored how ethically competent nurses behave in clinical nursing practice.

Background: Nurses' ethical competency is crucial in nursing practice as it promotes patients' safety and quality of care.

Methods: Using a purposive sampling technique, 20 clinical nurses in South Korea were interviewed via an online video platform. The data were analysed using a thematic analysis based on phenomenological approach.

Results: The main theme found among the participating nurses' ethical competency was caring beyond egocentrism, with two subthemes: (1) patient-centred care based on compassion and (2) responsible behaviour based on nursing professionalism. Factors that enabled this included (1) reasonable work conditions, (2) interpersonal relationships, and (3) nurses' rich personal experiences.

Conclusions: Nurses' ethical competency depends on how far they can move away from their own egocentrism and act for their clients' benefit, wherein an appropriate workload and warm human relationships with one's colleagues are essential. Nurses should thus receive education on ethics and professionalism and participate in volunteer and leisure activities that cultivate their degree of empathy.

Implication for Nursing Management: Nursing leaders and managers should understand nurses' ethical competency and its enabling factors to devise effective strategies to promote it.

KEYWORDS
egocentrism, ethical competency, health care ethics, nursing ethics, professional ethics

1 | INTRODUCTION

Nurses encounter ethical issues in their everyday practice (Park & Oh, 2016; Rainer et al., 2018), including those related to caring for patients and colleagues, other health care professionals, and their overall workplace (Numminen et al., 2015). For example, one study found that nurses experience ethical dilemmas in that aggressive treatment toward patients (including premature babies) who are at a terminal stage of their illness is more harmful than beneficial (Haahr et al., 2020).

Furthermore, in South Korea, intensive care unit nurses often suffer from moral distress, such as ambivalence toward treatment and care, a lack of ethical sensitivity, their own limited autonomy in treatment plans, conflicts with physicians, and conflicts with institutional policy (Choe et al., 2015). Furthermore, Korean emergency room nurses reportedly face various ethical difficulties; for example, Lee and Hwang (2020) outline a situation wherein the family caregivers of a patient, who had consented to a do not resuscitate (DNR), had changed their mind and then requested cardiopulmonary resuscitation (CPR). Another example found in previous studies was when a terminal cancer patient begged to be allowed to kill himself after taking pesticides because the pain could not be controlled even with narcotic analgesics (Lee & Hwang, 2020). In addition, Korean paediatric nurses have reported a sense of ethical numbness, such as failing to follow standard protocol in their nursing practice, because of the rapid completion of tasks under a heavy workload (Choe et al., 2019). Likewise, South Korean nurses face various ethical issues in their work. In particular, South Korea's nursing environment is dominated by medical paternalism and hierarchism due to the influence of Confucian culture (Jang & Oh, 2019); thus, nurses' autonomy is often greatly limited due to doctor-centred decision-making. To manage these ethical issues, nurses need to have ethical values, responsibilities, and professional accountability, in other words, a degree of ethical competency. Ethical competency is an individual capacity for ethical awareness, courage, decision-making, and willingness to act ethically (Kulju et al., 2016). It helps nurses think critically, analyse ethical issues, make decisions, solve moral problems, and behave appropriately during practice (Cannaerts et al., 2014). Given that nurses' ethical competency requires both organizational support and personal experience, as well as knowledge and communication (Kulju et al., 2016), nursing leaders play a key role in giving nurses the opportunity to gain ethical competencies (Poikkeus, Leino-Kilpi, & Katajisto, 2014; Poikkeus, Numminen, et al., 2014). Hence, it is pivotal to strengthen nurses' ethical competency at the organizational level to effectively shape an ethical climate within each hospital and improve the quality of patient care. Moreover, nursing leaders and managers need to understand how nurses can achieve a sense of ethical competency in their everyday practice so as to devise effective strategies for training them in it.

2 | BACKGROUND

There are several definitions of ethical competency in nursing. According to Kulju et al. (2016), ethical competency comprises a nurse's good character, ethical awareness, moral judgement ability, and the will to practice the right actions. Lechasseur et al. (2018) described nurses' ethical competency as a set of concepts including ethical sensitivity, knowledge, reflection, and decision-making. Further, Maluwa et al. (2022) found that ethical competency includes ethical reasoning, ethical sensitivity, ethical knowledge, skills, attitudes, motivation, behaviour, and the ability to make moral judgements and take responsibility for one's actions. To summarize,

many scholars see ethical competency as a complex ability that integrates an individual's personal capacities for good.

Ethical competency is at the core of overall nursing competency. For example, the nursing global health competencies framework (Torres-Alzate, 2019) includes ethical values as its core values and principles, which include social justice and equity, holistic care, advocacy, health as a human right, sustainability, and collaboration. Ethical competency thus enables nurses to promote patients' interests and treat them with respect and dignity, thereby increasing their satisfaction, outcomes (Kulju et al., 2016; Osingada et al., 2015), and overall quality of care (Paganini & Egry, 2011). The most apparent outcomes of ethical competence in nursing are in the provision of good care for patients, increased moral equality, and safety in care (Kulju et al., 2016).

Nurses' ethical competency is also a resource for them to use in coping with moral distress (Koskenvuori et al., 2019; Kulju et al., 2016). When nurses lack ethical competency, they cannot fulfil their moral obligations and tend to experience increased physical and mental distress (Silverman et al., 2021). Further, when nurses fail to manage this kind of distress, their nursing service and job satisfaction are impaired (Jang & Oh, 2019), leading to burnout and high turnover rates (Whitehead et al., 2014). Therefore, nurses' lack of ethical competency ultimately multiplies organizational conflicts and costs. Organizational support for promoting ethical competencies will thus improve nurses' work satisfaction (Poikkeus et al., 2020). A positive working climate improves ethical competence. This includes an open atmosphere between colleagues and staff groups and good communication channels for them to open up and listen to one another (Höglund, Eriksson, & Helgesson, 2010). Ethical competence can also be taught through classes in ethics, practical work experience, the provision of good examples, and role models in one's workplace (Höglund, Eriksson, & Helgesson, 2010).

Assessment of ethical competence is another important factor; however, few instruments have been developed to comprehensively measure this concept (Kulju et al., 2016). For example, Poikkeus et al. (2018) did not find any comprehensive assessment instruments for ethical competence or support for ethical competence in nursing. Ethical competency scales developed so far in nursing only partially measure certain parts of this concept: the Moral Sensitivity Questionnaire (Lützén et al., 2006), the Ethical Reasoning Tool (McAlpine et al., 1997), the Nursing Dilemma Test (Crisham, 1981) to evaluate the moral judgement ability of nurses, and the Moral Distress Scale to measure their moral distress (Corley et al., 2001). We found one instrument that comprehensively measures the moral competency of homecare nurses in Japan (Asahara et al., 2013); however, it may be limited in its applicability to clinical nurses.

Moreover, ethical competency in nursing has been explored theoretically, but lacks any empirical evidence at a practical level (Koskenvuori et al., 2019). To our knowledge, several qualitative studies have dealt with the ethical competency of nursing leaders (Barkhordari-Sharifabad et al., 2018a, 2018b), ethical competence in DNR decisions in haematology and oncology care (Pettersson et al., 2018), ethical competency of research nurses

(Höglund, Eriksson, & Helgesson, 2010; Höglund, Helgesson, & Eriksson, 2010), and educators' ethical competence (Borhani et al., 2010; Koskinen et al., 2020). Some studies have also been conducted on the support for ethical competence among nurse leaders (Poikkeus et al., 2018; Poikkeus, Leino-Kilpi, & Katajisto, 2014; Poikkeus, Numminen, et al., 2014), as well as others that sought to measure the level of ethical competence quantitatively (Poikkeus et al., 2018). Unfortunately, overall, there are few studies that have comprehensively explored the ethical competency of clinical nurses. Thus, this study explored how nurses with ethical competency behave in clinical nursing practice.

3 | METHODS

3.1 | Study design

This study used a thematic analysis based on the phenomenological approach. The consolidated criteria for reporting qualitative research (COREQ) were then used to report our findings.

3.2 | Participants

Nurses met the inclusion criteria if they (a) were working in a clinical setting(s) and (b) had at least 1 year of work experience. To collect comprehensive data regarding their ethical behaviours, no restrictions were placed on the type and size of the hospital and working department. However, nurses in the probationary period were excluded.

This study included 20 South Korean clinical nurses (2 men and 18 women). Participants were from five tertiary hospitals and one long-term care facility in Seoul and its surrounding areas. The mean age of our sample was 34 (range: 24–43) years, with their mean working duration being 10.4 years. The participants' working departments included intensive care units; surgical, medical, emergency, psychiatric, and oncology departments; long-term care facilities; and operating rooms (Table 1).

3.3 | Data collection

Snowball sampling was used to recruit participants. This provides access to particular populations that then allows researchers to gain a deeper understanding of the phenomenon in question in a way that does not seek to generalize the findings (Naderifar et al., 2017). Nurse acquaintances of the authors were asked to invite other nurses who met the inclusion criteria. Potential participants contacted one of the authors and were informed of the purpose and procedures of this study. After the participants provided their informed consent, the interview schedule was set. Following the COVID-19 quarantine guidelines, the interviews were conducted through online meetings via Zoom and telephonically.

This study's interviews included individual interviews (with eight of the participants), 2 two-person interviews (four participants), and eight-person group interviews (eight participants). In the phenomenological approach, small group interviews, as well as individual interviews, are an effective way to set up a familiar communicative context and dialogue in data collection (Benner, 1994). "They (small group interviews) create a natural communicative context for telling stories from practice, allowing peers to talk to one another as they ordinarily talk rather than translating their clinical world for the researchers. They provide a rich basis for active listening when more than one listener" (Benner, 1994, p. 109).

The authors conducted each interview either two or three times, with the interview length ranging from 40 to 90 min. The reason for conducting the interviews more than once was to fully capture the stories that the participants could not complete in one interview or to discover any content that came to mind after the first interview.

Participants considered the meaning of "ethical" to be "desirable, right, and good" behaviours for patients and recognized unethical behaviours as undesirable and bad. Further, participants considered ethical nurses to be good for patients. The following questions were used to promote their experience-sharing: "Tell me in, detail, about situations in which you believe that you did the right (or good) thing while working as a nurse," "When was an ethical judgment necessary while working as a nurse? How did you make your decision in that situation? On what basis did you think that judgment was correct?" "What was the most important consideration when deciding to act?" and "Tell me about ethical nurses you have observed. Describe the behavior and character of a nurse who acted ethically." Interviews were recorded with the consent of the participants. The point in time in which the participants' stories revealed no more novel information was regarded as data saturation. Data collection and analysis continued until data saturation.

3.4 | Data analysis

A thematic analysis aims to understand patterns of meanings from data on people's lived experiences, such as through the use of interviews or personal narratives (Sundler et al., 2019). Our interviews were transcribed and analysed by both authors. First, both authors read the transcribed data several times and underlined certain nursing behaviours for coding. Each code was given a specific number (e.g., No. 231. "Calling out the name of an unconscious ICU patient while caring for them").

Second, the authors read the codes together and classified them by similarity to conceptualize a more abstract concept. For example, "Calling out the name of an unconscious ICU patient while caring for them," "Listening carefully to patients who cannot communicate without getting angry," and "Minimizing bodily exposure of anesthetized patients in the operating room" were merged into "Providing respect for the dignity of patients."

Third, the authors re-conceptualized the concepts revealed from the second step into a subtheme that represented a more abstract concept. For example, "Providing respect for the dignity of patients,"

TABLE 1 Demographic characteristics of the study participants

No.	Pseudonym	Age	Sex	Marital status	Education	Total work duration	Position	Department	Interview type
1	Ari	37	Female	Married	MSN	16 years 6 months	Charge nurse	Medical department	Individual
2	Beahee	43	Female	Married	MSN	20 years 7 months	Charge nurse	Surgical department	Individual
3	Chansu	36	Male	Married	MSN	1 year 6 months	Staff nurse	Surgical department	Individual
4	Chunga	37	Female	Married	MSN	14 years 6 months	Charge nurse	Intensive care unit	Individual
5	Deaho	26	Male	Single	MSN	2 years 10 months	Staff nurse	Long-term care facility	Group
6	Eabin	37	Female	Married	MSN	17 years 8 months	Charge nurse	Intensive care unit	Individual
7	Esol	27	Female	Single	BSN	4 years 6 months	Staff nurse	Surgical department	Group
8	Hyeun	43	Female	Married	PhD	21 years	Charge nurse	Medical department	Group
9	Jinsue	26	Female	Single	BSN	4 years 10 months	Staff nurse	Emergency room	Group
10	Keehea	43	Female	Married	ADN	21 years 7 months	Nurse director	Psychiatric department	Individual
11	Lina	26	Female	Single	BSN	3 years 5 months	Staff nurse	Intensive care unit	Group
12	Meesuk	26	Female	Single	BSN	2 years 10 months	Staff nurse	Medical department	Group
13	Mihee	38	Female	Single	BSN	3 years 7 months	Staff nurse	Surgical department	Group
14	Myoungjoo	45	Female	Married	MSN	22 years 2 months	Charge nurse	Operating room	Individual
15	Nami	24	Female	Single	BSN	1 year 10 months	Staff nurse	Operating room	Group
16	Osu	29	Female	Married	BSN	2 years 9 months	Staff nurse	Oncology department	Group
17	Ran	41	Female	Single	ADN	18 years	Staff nurse	Emergency room	Individual
18	Rue	25	Female	Single	BSN	2 years	Staff nurse	Psychiatric department	Group
19	Sehee	43	Female	Divorced	MSN	23 years	Charge nurse	Diagnostic department	Group
20	Songmin	28	Female	Single	BSN	1 year 2 months	Staff nurse	Psychiatric department	Group

Abbreviations: ADN, Associate Degree in Nursing; BSN, Bachelor of Science in Nursing; MSN, Master of Science in Nursing; PhD, Doctoral Degree in Nursing.

TABLE 2 Themes and subthemes on the ethical behaviours of clinical nurses

Themes	Subthemes
Caring beyond egocentrism	Patient-centred care based on compassion
	Responsible behaviour based on professionalism in nursing
Factors that enable caring beyond egocentrism	Reasonable work conditions to support nursing practice
	Interpersonal relationships among nurse colleagues
	Nurses' own rich personal experiences

"Feeling sorry for patients and caregivers who are struggling," and "Explaining kindly at the patient's eye level" were conceptualized into the subtheme, "Patient-centred care based on compassion." The following subthemes emerged from this third step: "Patient-centred care based on compassion," "Responsible behaviour based on professionalism in nursing," "Reasonable work conditions to support nursing practice," "Interpersonal relationships among nurse colleagues," and "Nurses' own rich personal experience."

Fourth, this conceptualization was then used to generate two main themes that included the subthemes from the previous steps (Table 2). The concepts named during the analysis process were directly from our data and not from any specific theory.

3.5 | Ethical considerations

The institutional review board of the first author's university approved this study (IRB No. masked for review). The authors explained the purpose and procedure of the study and assured participants of their confidentiality, anonymity, and their freedom to withdraw from the study at any time.

3.6 | Rigour

For the trustworthiness of this study, all main and generic categories created were supported by participant quotations. Member checking

(Birt et al., 2016) was also conducted to confirm the trustworthiness of the results. The two main themes and the subthemes were sent to the participants by email, and they then checked whether the results coincided with their own interview content. Out of the 20 participants, 19 replied that the results were consistent with their interview content; one participant did not reply.

4 | RESULTS

Nurses' ethical competency involves the ability to care beyond one's own egocentrism, with this being possible when one behaves based on a sense of compassion and professionalism. Further, this competency is enhanced through the application of reasonable work conditions, good interpersonal relationships among nursing colleagues, and each nurse's rich personal experience.

4.1 | Caring beyond egocentrism

4.1.1 | Patient-centred care based on compassion

All our participants perceived their behaviours as ethical when they placed the interests of struggling patients and family caregivers above their own. Importantly, participants stated that patient-centred care is provided when nurses seek to protect the life and dignity of the patient and provide them with the best care possible. Participants believed that ethical nursing practice originates from the concept of compassion that arises spontaneously from the heart.

Although some participants suggested that behaviour intended to protect life itself is an important ethical behaviour, most felt that ethical behaviours are the consideration for the patient as a human being regardless of any conditions. Participants provided several examples of ethical behaviours intended to respect a patient's dignity.

> It was when I was working at the ICU... the nurse was in the 3rd to 4th year at the time. To my surprise, she introduced herself to the patient who had no consciousness. The nurse stated her name and the reason for back care, and when doing the suction, she said, "I will now do the suction." She said things like, "Oh, did it hurt," to show sympathy for the patient's pain. (Daeho, 26, Long-term care facility)

Further, participants considered compliance with nursing standards and guidelines as ethical behaviour because this represents an effort to provide good care. Some participants said that a nurse should strictly follow the aseptic technique regardless of how busy they are and should frequently replace the dressing set. One participant felt guilty when she failed to comply with the aseptic procedures. Some participants considered checking patients' conditions frequently, regardless of their own level of tiredness, as ethical behaviour, and felt that even when physically tired during a night shift, a nurse should recheck the needs of a patient, as this represents caring for them.

Sometimes, compassion for a patient extended to concern for their family as they faced the challenges of the patient's disease. For example, some nurses felt that pity for family caregivers who worried about the treatment cost was ethical. Conversely, participants regarded nurses who acted based on their own convenience or demonstrated a lack of interest in the patient in a way that then led to inadequate care as unethical. For example, this could include nurses who inaccurately calculate intake and output as well as vital signs, and who simply record the values without informing other nurses of any abnormalities therein, document that care has been given contrary to fact, fail to check and makes an error in injections, treat a patient complaining of pain dismissively, or discriminate against low-income or drug-abusing patients.

4.1.2 | Responsible behaviour based on professionalism in nursing

Most participants considered responsible behaviours as ethical. They stated that an ethical nurse is someone who has a firm professional belief that they should care for patients with sincerity.

> To behave ethically, one should be courageous and have basic knowledge and love of and faith in the profession of nursing. (Chansu, 36, Surgical department)

The participants stated that honesty is an ethical behaviour and includes reporting one's errors in nursing practice. They said that nurses should be honest because the profession as a whole requires honesty. Some participants stated that a nurse who loves their profession has clear goals or a professional belief to make the right decisions and to provide the best patient care.

> A nurse who has firm beliefs and who tries to head in the right direction in life with maybe a motto, is likely to show character in nursing such that self-reflection steers the nurse to achieve more ethical behaviors, I think. (Lina, 26, Intensive care unit)

4.2 | Factors that enable caring beyond egocentrism

4.2.1 | Reasonable work conditions to support nursing practice

The participants stated that work conditions influence nurses' ethical behaviours. If nurses are given an adequate amount of work based on an appropriate amount of nursing staff and reasonable administrative procedures are implemented, they can then efficiently concentrate on patient care and treat patients in a relaxed manner. In particular, a lack

of manpower then causes excess workload, therefore ensuring sufficient nursing staff is crucial.

> After surgery, someone needs to care for the patient until they recover from anesthesia and are stable, but the caregiver cannot enter the recovery room due to infection issues and there is an insufficient number of nurses, so it would help substantially if efforts are made to provide additional manpower including safety workers. (Myoungjoo, 45, Operating room)

The participants reported that unethical behaviours result from nurses being busy with too many tasks to pay sufficient attention to the checking of an injection area or a patient's pain and discomfort. New nurses who could engage in less efficient task performance felt enraged by increasing demands from patients that multiplied their tasks and left them exhausted.

> When I was a new nurse, I had three patients (to attend to in the ICU), and (the work) being urgent, I couldn't help but feel angry toward a patient who kept asking for something. In a case like this, I just couldn't treat the patient so well, you know, I'm only human, and... the task had to be handled rapidly, and I couldn't pay very much attention (to the patient)... I think, maybe this is the type of situation that drives a nurse toward unethical behavior. (Lina, 26, Intensive care unit)

The participants stated that a reasonable work system and administrative procedures also influence ethical behaviours. Thus, some participants felt that unfair customary practices and treatment in the ward contribute to unethical behaviours. Interestingly, some participants said that when the nurses are watched, they are more likely to behave ethically and follow appropriate care principles.

> My behavior changes when I feel someone is watching and when I feel I am alone. The ER is an open space so that I am constantly feeling someone is watching me, and I try to act more decently, comply more strictly with rules, and take more care not to make a mistake. But in a ward where there is no one to watch me, I become less strict in practice. (Esol, 27, Surgical department)

4.2.2 | Interpersonal relationships among nurse colleagues

The participants reported that the most influential factor in ethical competencies is communication with one's colleagues that then builds positive interpersonal relationships. When working with a colleague who communicates well (e.g., provides things like positive feedback,

comforting words, and cheerful messages), nurses would be more likely to act ethically. Additionally, ensuring an atmosphere of mutual respect and support and credit for work done increased nurses' self-esteem. Good interpersonal relationships between nurse colleagues allowed participants to cope with ethically difficult situations.

> What is necessary for a nurse to behave ethically... an entire atmosphere should be created and not a single, perfect nurse. The nurses should have a basic trust in one another and keep on encouraging those that are a bit inept so that they may strive further to improve their care. When the youngest nurse joined our team, she had such a dark demeanor... but she turned much brighter as we continued to treat her kindly. (Keehae, 43, Psychiatric department)

Conversely, the participants regarded nurses who speak negatively as being unethical as they often caused discomfort among their colleagues. Some participants reported that they actually developed an intent to leave their department when a nursing supervisor criticized a new nurse in front of either patients or other nurses.

4.2.3 | Nurses' own rich personal experiences

Participants stated that their own personal experiences, such as those involving their careers, education, voluntary work, and leisure activities, contributed to their performance of ethical behaviours. Most participants placed a high value on a career in nursing and regarded direct experience in the field as the best method for learning to distinguish between right and wrong behaviours. Further, they stated that new nurses viewed a given situation in parts rather than as a whole, while experienced nurses with more practical expertise could understand a given situation in its entirety, allowing them to choose appropriate responses and suggest more effective alternatives.

> (A career length of) about 5–8 years or more is necessary, I think, for a nurse to be able to start thinking about improvements... improvements in accordance with the circumstances and conditions in a given department. Because then they know a bit about the atmosphere of the department and when to provide a suggestion that will be accepted. (Myoungjoo, 45, Operating room)

Education on nursing ethics was regarded as another factor contributing to their performance of ethical behaviours. Some participants felt that the educational curriculum at nursing colleges should foster ethical competencies by reinforcing the sense of vocation and professional ethics in the nursing field. Nursing students in South Korea undergo two to three credits worth of bioethics or nursing ethics courses during their 4-year qualification. As such, participants mentioned that nursing students must be made aware of undesirable

behaviours that are easy for nurses to mistakenly engage in during clinical practice.

> When I see some nurses use the hospital goods as their own, such a problematic behavior that lacks professional ethics, I feel it is necessary for nursing students to be given an education regarding such behaviors. (Hyeun, 43, Medical department)

New nurses often receive direct education from their nursing officer in clinical settings or try to self-monitor their own behaviours. One participant reported that having a nursing officer encourages introspection while educating new nurses.

> Each year, when a naive new nurse comes, I think, "Ah, I was like them once…" and this gives me an opportunity to reflect on myself, my own sense of ethics. (Jinsue, 26, Emergency room)

Additionally, some participants stated that experiences with interpersonal relationships gained through voluntary work and leisure activities also contributed to their ability to empathize and communicate with others. They also believed that direct/personal experiences with a given disease or with caring for a family member, a growing child, or an older adult affects one's ethical nursing care.

> When I have someone close to me in a similar situation, I can empathize with the patient far better and notice things more, which could create a human bond, and for such experiences to build up, voluntary work seems considerably important… I think the experiences enabled me to empathize better. (Songmin, 28, Psychiatric department)

5 | DISCUSSION

This study explored nurses' ethical competency and respective facilitating factors in clinical settings. This study revealed that the ethical competency of nurses was intertwined with compassion and professionalism centred on the patient. Working conditions, interpersonal relationships with colleagues, and personal experiences influenced the ethical competency.

Patient-centred care based on compassion is one of main themes in this study's findings. The participants said that ethically good nurses are those who provide patient-centred care with a good degree of compassion for each patient's unique needs. In recent decades, patient-centred care has gained increasing attention because it has been found to improve patient satisfaction as well as clinical and economic outcomes (Bachnick, et al., 2018; Zill et al., 2015). The three essential components of patient-centred care are effective communication, partnership, and health promotion, with the three components of communication being sharing information, compassionate and empowering care provision, and sensitivity to patient needs (Constand et al., 2014). In other words, providing compassionate care is a key component of achieving patient-centred care, and this is a main meaning of nurses' ethical competency in this study.

Primarily, the participants highlighted the critical role of compassion in nurses' ethical competency. We found that nurses' ethical competency depends on how much compassion is inherent in their nature and how it manifests in their relationships with clients. As nurses spend time and communicate with patients effectively, the latter then experience this sense of compassion (Durkin et al., 2019). Furthermore, patients often expect nurses to be compassionate and trustworthy (Wiechula et al., 2016), which then serves to elicit, from nurses, intense feelings of love, empathy, and care for patients (Vouzavali et al., 2011). By being attentive, open, respectful, and treating patients humanely, nurses can enhance their own and the former's sense of personal meaning in this relationship (Karlsson & Pennbrant, 2020). As such, nurses need help in expressing their compassion through their actions. Further, compassion for others can be enhanced by appropriate sympathy-based education and role modelling in nursing education (Straughair, 2019).

Nurses' ethical competency can also be derived from their own responsible behaviours based on their own sense of professionalism. Nurses who practice the professional values of their career make appropriate decisions in ethical dilemmas (Kaya & Boz, 2019). According to Nikkhah et al. (2017), the main component of nurses' ethical behaviours includes deontology (i.e., being on time for work, regulatory compliance, maintaining professional boundaries, establishing relationships based on trust, demonstrating a willingness to learn, and avoiding selfishness and arrogance in the provision of care). Knowledge and awareness of the professional values of their field influence nurses' decision-making and patient care (Poorchangizi et al., 2017). Ethical dilemmas that are addressed through actions guided by nursing values and beliefs would then also enhance the quality of nurses' professional lives (Kim et al., 2015). Nurses' ethical behaviours are thus important not only to patients, who have a right to be respected, but also to the nurses themselves as they are professionals with moral values (van der Cingel & Brouwer, 2021). Moreover, honesty in the form of adherence to the facts of a given case is a core professional value of nursing (Kaya & Boz, 2019). In this study, participants emphasized the value of honesty specifically. Despite fear regarding consequences or potential retaliation, ethical nurses have a sense of responsibility and exhibit the courage needed to report a mistake (Mansouri et al., 2019) or the occurrence of unsafe practices in patient care (Cole et al., 2019).

Our findings also suggest that nurses' physical and emotional working environments are other essential determinants of their ethical competency. For example, nurses may face ethical challenges if their organization and system do not support the nurse–patient relationship. Notably, ethical behaviours may not depend solely on a given nurse's ethical sensitivity because decision-making in clinical practice may be challenged by numerous organizational complexities (Amiri et al., 2020). An appropriate working environment is thus essential for promoting nurses' compassionate care; as such, this style of care

cannot simply be viewed as the individual responsibility of nurses (Tierney et al., 2019).

In South Korea, insufficient staffing due to high turnover and excessive workload is an ongoing problem in the health care field. The total nursing manpower (including both nurses and nursing aides) in South Korea is 8.4 per 1000 population. This is lower than the Organization for Economic Co-operation and Development (OECD) average (9.7 persons). Among them, 4.4 nurses were among the total nursing manpower, which was lower than the OECD average of 8.0 (Ministry of Health and Welfare, 2022). This shortage of manpower among nurses in South Korea has been continuously reported in the media over the past 5 years (Chin & Kwon, 2021). The shortage of nurses, as well as the resulting increased workload, leads to emotional exhaustion (Kim et al., 2019), with burnout and job dissatisfaction making nurses more likely to leave (Ambani et al., 2020). Hence, organizational support plays a key role in nurses' work satisfaction (Poikkeus et al., 2020). Bruyneel et al. (2015) found that factors involved in nurses' working environments are also associated with patient outcomes. For example, the provision of adequate staffing and resources are related to increased patient satisfaction (Wong et al., 2013). After all, hospitals need to have adequate nursing manpower to secure sufficient time for nurses to provide patient-centred care and to reduce the burden of heavy workloads (Bachnick et al., 2018).

Our results also indicate that ensuring positive communication among nurses and other health professionals is vital to the formation of a supportive psychological environment for the former's ethical competency. Communication, establishing interpersonal relationships, collaboration, and critical thinking abilities can all be used to develop ethical competencies (Trobec & Starcic, 2015). Moreover, colleague solidarity is another motivational factor as it helps people maintain positive relationships with their colleagues, feel safe, learn from others, and develop themselves, which then influences the wider organizational culture (Göktepe et al., 2020).

Our participants also reported that positive feedback and consolation received from their colleagues increased their overall self-esteem. Nurses with higher self-esteem are then more likely to nurture a positive understanding of their own personal dignity, which is a core ethical concept (Sturm & Dellert, 2016), meaning that they can then provide better care to patients and are less likely to suffer from burnout (Peterson-Graziose et al., 2013). Furthermore, nurses with higher moral sensitivity tend to have greater self-esteem (Rahnama et al., 2017). Therefore, a good relationship with one's colleagues contributes to the formation of an ethical climate and a virtuous cycle that then enhances nurses' self-esteem and strengthens their ethical competency. An ethical climate within a given hospital exerts a positive influence on the work satisfaction of nurses; therefore, it is vital to ensure this kind of environment adheres to high ethical standards (Jang & Oh, 2019). Nursing leaders and managers need to make appropriate efforts in establishing a harmonious interpersonal environment and be aware of any hostile attribution biases to prevent nurses' unethical behaviours (Qi et al., 2020).

This study also found that nurses' rich personal experiences gained from their nursing careers, education, voluntary work, and leisure activities also help to cultivate their ethical competency. In sum, we found nurses to be influenced by their work experience, type of nursing environment, educational level achieved, adherence to professionalism, critical thinking, and various personal factors (Rizany et al., 2018).

Younger nurses and those with fewer years of experience tend to encounter ethical issues more frequently and report higher levels of stress (Ulrich et al., 2010). Therefore, nurses' ability to identify, understand, and apply the values of their profession (Sibandze & Scafide, 2018) is a critical step in advancing nursing practice and enhancing overall care quality. Therefore, nursing leaders should educate newer nurses on ethical procedures and practices, encourage them to have pluralistic discussions and collaborations with colleagues on relevant ethics, and encourage individual nurses to participate in education on ethical problem-solving (Poikkeus et al., 2018).

5.1 | Limitations

This study does have some limitations. First, we explored the ethical competency of nurses in South Korea; thus, our findings should be applied with caution to other cultural backgrounds. Furthermore, while conducting this study, although the authors did not find any differences in the meaning of ethical competency between Korean nurses and those of other countries, it is still crucial to consider the impact of cultural differences as these then have an influence on peoples' notions of ethics. Fundamentally, culture, religion, language, and personal experiences play roles in ethical deliberations (Mendola et al., 2022). Nevertheless, despite the differences found among nurses regarding their cultural, social, and medical environments, this study's findings contribute to the understanding and promotion of ethical competency among nurses. Finally, it must be noted that this study did not explore the difference in nurses' experiences resulting from gender differences and clinical experience; as such, this is a potential avenue for future research.

6 | CONCLUSIONS

Clinical nurses' ethical behaviours in their own professional practice depend on how well they care for their patients beyond their own egocentrism, as this leads them to assign greater value to the patients' needs than their own. Our findings suggest that there are multiple factors that enable nurses to behave ethically: their work conditions, sound administrative systems, an appropriate workload, and an adequate nursing staff. Good communication among nurses is also needed to establish supportive relationships and exchange positive feedback. Additional factors that contribute to the ethical behaviours of nurses include educational experience related to their own professional knowledge and ethics, as well as them having a spectrum of social relationships, such as those associated with hobbies, voluntary work, or leisure activities. Based on these factors, strategies may be developed to increase the level of compassion of clinical nurses.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

Nursing leaders and managers can devise various strategies to strengthen nurses' ethical competency based on our findings. They should first understand the nature of ethical competency in actual clinical situations. Importantly, they should play an essential role in forming the organization's ethical climate and in strengthening nurses' ethical competency. Thereby, the ethical competency of nurses will enhance the quality of nursing care, patients' safety, and nurses' job satisfaction. It will also contribute to increased nurse retention, an ethical organizational climate, and overall patient satisfaction.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS

Three authors have contributed to this research as follows:

Kwisoon Choe: Conception and design, data collection, data analysis and interpretation of data, writing and revising the manuscript.

Soojin Kwon: Writing the discussion session.

Sunghee Kim: Writing the introduction and background session, revising the manuscript.

ETHICS STATEMENT

This study received ethical approval from Institutional Review Board of Chung-Ang University (No. 1041078-202006-HRSB-163-01).

DATA AVAILABILITY STATEMENT

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

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ORIGINAL ARTICLE

WILEY

A qualitative study exploring the influence of a talent management initiative on registered nurses' retention intentions

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Abstract

Aim: The aim of this study is to explore the influence of a talent management scheme in an English National Health Service (NHS) Trust on registered nurses' retention intentions.

Background: The retention of nurses is a global challenge, and talent management initiatives can play a role in improving retention. Talent management in its broadest sense is a way in which an organization recruits and retains the workforce that it needs to optimize the services it delivers.

Methods: In this qualitative study, eight in-depth semi-structured interviews were conducted with registered nurses who had participated in a talent management initiative, at an English acute NHS Trust. Data were collected in July 2019.

Results: The talent management initiative influenced positive retention intentions. Retention of nurses was facilitated by the creation of networks and networking.

Conclusion: Networks and networking can be viewed as a form of social capital, which was a facilitating factor for positive retention intentions for nurses.

Implications for Nursing Management: Talent management initiatives for nurses should be developed and directed to include the building of networks and networking to enable development of social capital. Although this talent management scheme is within the NHS, the issue of nursing retention is global. Application of learning from this paper to other health care systems is possible.

KEYWORDS
human resource management, networks, nurses, retention, social capital, talent management

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1 | INTRODUCTION AND BACKGROUND

The retention of nurses in the workforce is recognized as a global challenge and is central to ensuring that health services are accessible and of good quality. Low retention rates are a concern as nurses are the largest safety-critical profession and demand for nurses is only expected to grow (Halter et al., 2017). The underlying causes of nursing shortages are multi-faceted, and as a result, solutions to retention are complex (Buchan & Aiken, 2008).

In the NHS, there is currently a shortage of nurses, with a 10.5% vacancy rate in England (NHS Digital, 2021). While recruitment has often dominated the discourse around this shortage, retention of staff is gaining significant attention (Buchan et al., 2019; Nuffield Trust, 2022). Reviews have indicated that a lack of career development are a reason for nurses leaving (House of Commons Health Committee, 2018). Therefore, this places talent management as a key component in helping to alleviate nurse retention issues. In this article, we debate the key concepts of talent management and report on a study that explores the impact of a talent management programme on nurses' retention intentions.

1.1 | Nursing retention

Predictive elements that have been shown to improve nurse retention include autonomy, empowerment, job satisfaction, career development and organizational practices including managerial style, placement opportunities and supervisory support (Mills et al., 2016). As a result, health care organizations are formulating talent management initiatives, which can enable them to retain their experienced and skilled workforce. Talent management can impact upon organizational performance, including retention (Dahshan et al., 2018). However, few talent management schemes have been evaluated for their specific benefits (Haines, 2016).

1.2 | Talent management theory and concepts

Talent management involves 'growth from within' and incorporates the development of employees and not just their utilization for organizational benefit. It is thus imperative organizations develop the 'human capital' of their employees. Human capital encompasses the knowledge and ideas of individuals, which includes their emotional intelligence, values, motivations and inter-personal skills (Bottone & Sena, 2011). Social capital, defined here as the value of connections, and knowledge and resources embedded within networks of relationships (Nahapiet & Ghoshal, 1998; Youndt & Snell, 2004). It is an emerging field in nursing research (Read, 2014), which could help create and develop human capital (Coleman, 1988). Nurses' social capital has positive consequences for nurses, their patients and health care organizations

(Xu et al., 2020). Indeed, social capital could support talent management by influencing nurse retention, including a greater sense of job satisfaction, which is indicated in enhancing nurses' retention (Read & Laschinger, 2015). Talent management in its broadest sense can be considered as a way in which an organization constructs and renews the type of workforce that it needs to be successful. There is no single definition of talent, but it can be viewed through four primary lenses (Figure 1).

Variations in the definition of talent impact upon its management. An inclusive, developable lens considers that all employees can grow and change and has an underlying assumption that individuals have an intrinsic need to fulfil themselves (Meyers & von Woerkom, 2014b). Proponents of an inclusive, developmental perspective state that this approach also enhances wellbeing through positive psychology and considerations of the Capability Approach, with benefits for the individual and organization (Swailes et al., 2014). This study views talent management from an inclusive perspective for reasons we will explain below.

1.3 | Talent management in health care and nursing

Talent management within the NHS has moved to become more inclusive and developmental due to criticism for not being able to meet the dynamic and complex demands of service (NHS Leadership Academy, 2015). One challenge, however, is understanding how talent management schemes are, or are not, successful in helping to retain nurses. The concept of talent management within
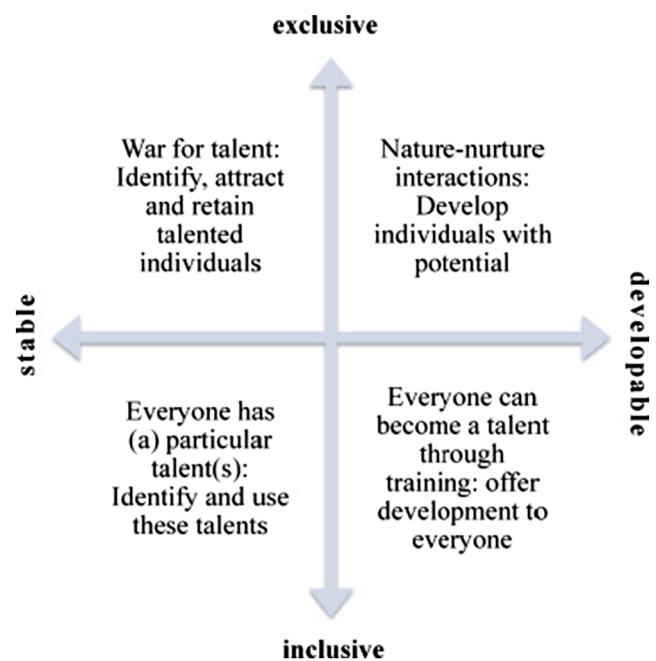
FIGURE 1 Philosophies of 'talent' management. Meyers and von Woerkom (2014a)

nursing is not well established, despite individual components of talent management such as retention and development gaining attention.

1.4 | The chief nurse excellence in care junior fellowship

One example of a talent management initiative, the Chief Nurse Excellence in Care Junior Fellowship (CNF), was developed in a large acute NHS Trust in 2016. NHS Trusts are public sector bodies that provide health care for a particular geographical area and are normally either acute, community, ambulance or mental health service focused. The term junior was used to identify the fellowship as an early career opportunity. It is part of a wider fellowship development programme that also incorporates opportunities for mid and late career nurses.

The CNF programme was developed in response to challenges in the retention of nurses and feedback indicating staff wanted more development opportunities. The CNF aims to develop participants' skills in change management, innovation, improvement science and leadership. The target group were Agenda for Change (AfC) band 5 nurses, as they make up a large proportion of the nursing workforce (53%) in the Trust. AfC is the national pay scale for nurses and other health care professionals in the NHS, and band 5 is the level at which nurses enter as registered staff. While this programme was initially aimed at nurses, it has subsequently expanded to AHPs and Midwives and nurses on other AfC bands.

The CNF takes place over 12 months with 1 day per week out of clinical practice and has two components. First is a bespoke development programme, underpinned by an inclusive talent management approach. The programme includes one-to-one mentorship and opportunities for public and patient engagement. Depending on prior knowledge and experience, there is also the provision of specific training including quality improvement methodology and project financial management. Second is a quality improvement project that focuses on an area pertinent to clinical practice and is aligned to organizational and nursing-specific strategic objectives (Bramley et al., 2018).

Mentors from either nursing, midwifery or AHP backgrounds who have clinical academic expertise (many of whom are post-doctoral) work collaboratively with clinical leaders, for example, specialist nurses, advanced clinical practitioners and ward leaders, to develop the individual knowledge and skills and projects of the CNFs. Previous projects have included enhancing dementia care in recovery (Edis, 2017) and enhancing the care of patients' neutropenic sepsis patients (Leighton, 2018).

In order to understand the impact of the CNF fellowship as a talent management programme on the retention intentions of staff, further research was warranted. The lead author of this paper, who is external to the Trust and has a specialist interest in nurse retention, conducted the research and analysis independently from the programme leaders. The aim of this study was to explore the impact of the CNF initiative on retention intentions of staff.

2 | METHODS

2.1 | Sampling/participants

Participants were recruited with the help of gatekeepers within the Trust. Between 2016 and the time of the research (July 2019), 23 individuals had been CNFs with 21 remaining in the organization. An email sent out to the current and alumni CNFs with a participant information sheet. The sampling approach was purposive due to the specific targeting of those who had or were undertaking the CNFs scheme, enhancing the trustworthiness of the study outcomes (Elo et al., 2014). Participants who were interested contacted the researcher directly. Out of a possible 21 respondents, eight responses were received, and eight interviews were conducted. Seven AfC band 5s, one AfC band 6, whom had between 2 and 6 years of clinical experience post-qualification were interviewed. Of these, seven were registered nurses (six adult nurses, one children's nurse, of these seven, six were female, and one was male), and one was an Operating Department Practitioner (female).

2.2 | Data collection

Semi-structured interviews were utilized to gain an in-depth understanding of the scheme from the participants' perspectives. Interviews were conducted either face to face (taking place in participants' Trust work areas, in a Trust corporate office or within a University room) or via telephone. A choice of interview type and location was provided to participants to maximize flexibility and convenience for participants and aid in recruitment. All interview locations were in private areas, to minimize noise, distractions and interruptions and protect confidentiality. An interview schedule developed with Trust partners was used in both face-to-face and telephone interviews. Questions exploded aspects of participants' development that had benefitted from the CNF scheme, previously identified from survey data collected by the Trust, and how participants felt this had occurred, focusing on the influence of these on their retention outlook. The interview schedule was reviewed by the study team (ST, JL and SFR) prior to the interviews to ensure clarity and appropriateness of questions. All interviews were conducted by the lead author of this paper and lasted for an average of 45 min (with average length of face-to-face and telephone interviews 40 min and 50 min, respectively). Both face-to-face and telephone interviews were audio recorded using a voice recorder.

2.3 | Data analysis

Interviews were transcribed verbatim and then read through in full to check for accuracy alongside the audio recordings. The transcripts were analysed thematically following Braun and Clarke (2006) using an inductive approach. The inductive approach derives analysis from the raw data, not from pre-existing theoretical models,

which enabled the analysis to remain open to all possible influences on retention and the outcomes from the CNF. Codes, themes and developing interpretations were discussed in the study team, to promote criticality, rigour, transparency and credibility. The main consideration for analysis was in relation to the CNF's impact on participants' retention intentions. The study team then looked for factors which impacted these intentions, which subsequently formed the further themes: career development and networks and networking.

2.4 | Ethical considerations

This evaluation corresponds to the definition of a service evaluation according to the Health Research Authority (HRA) (2017), which was supported by the Trust, meaning it does not require NHS Research Ethics Committee approval. A service evaluation considers how well a service is achieving its intended aims and is conducted to judge the merit of that service. However, full ethical principles were still followed. Participants were informed that any data generated from the interviews, and their confidentiality would be protected under the *Data Protection Act 1998* and the *European Union General Data Protection Regulation*. All names of the participants and those that they mentioned in their interviews were anonymized. Participants were given a consent form to sign and had the right to withdraw at any time. There were no risks identified to participants.

3 | RESULTS

3.1 | Retention intentions

Participants expressed positive views in relation to the CNF, which they felt impacted their retention intentions. These included feeling valued, invested in, and that their ideas and opinions were listened to. Participants also expressed that this brought with it a sense of feeling connected, while still being recognized as an individual and less like a "small cog in a big wheel" (Participant 6). This meant that they felt more positive about staying at the Trust.

> Participant 1: ... I feel more valued, I feel like my opinions and ideas are important because I didn't feel like that before ... there is more of a connection to the Trust now as a whole.

Participants spoke about how having the exposure to the leadership of senior nurses enabled them to see how motivated the Trust was in terms of retention and encouraging development. Some participants felt that this brought with it a sense of loyalty towards the Trust, while others felt that due to this exposure, they were able to feel less like a "worker ant" (Participant 6).

> Participant 2: ... I feel if you feel invested in, then I want to stay somewhere because then I feel a sense of loyalty back to them ... I feel it's so important to know that someone cares about how I develop as an individual.

> Participant 4: ... made me feel like this is a really good place to work and this is the kind of people I want to learn from and this is the nursing leadership I want to be under ... they've given me this opportunity so now I don't have a reason to leave.

Finally, it was indicated that the CNF supported retention in the profession, even if not to the Trust. From the CNF, participants could see what they wanted and needed, and it (the CNF) allowed them to apply elsewhere for a job that met those needs rather than them staying in the same job and getting disillusioned potentially resulting in loss from the profession.

> Participant 8: ... I was not given or were not able to access the same opportunities after the Chief Nurse Fellows scheme in the Trust so I looked elsewhere.

3.2 | Career development

Career development was noted to be a significant factor for participants in relation to their positive retention intentions. The majority of participants said that the skills and development they had gained from the CNF had resulted in them getting new jobs, whether that be a promotion, or enabling them to put a "foot in the door" (Participant 5).

> Participant 3: ... I was looking at band 6s and what criteria was needed and then I saw that [CNF scheme advertised], and thought that will be really good, because at that point I didn't feel quite ready to apply for a band 6. It [CNF scheme] is really good for transition.

Participants also spoke about being able to step back and see what other opportunities there were, which took them out of the "silos of nursing" (Participant 2). Participants spoke about the importance of movement and being able to "try on" (Participant 4) different components that helped them to gain an insight into different career areas.

> Participant 5: I like change, and if I felt like I was stuck in an area with nowhere to go I think that would not be good for me. That would really put me off working somewhere.

All participants spoke about how important their career development was to them, including reasons such as the desire to improve themselves and patient care. They felt that if there were no opportunities, they would look elsewhere. This intersection between career development and retention were discussed regularly. However, the opportunities that came from the exposure due to the CNF scheme needed to be capitalized on after it had finished.

3.3 | Networks and networking

A facilitating factor for retention and career development was networks. This came in two forms. First, the building of networks was considered by participants to aid their personal and professional development. For example, participants felt that networks acted as support mechanisms for personal and professional wellbeing, which were reflected through the mentorship elements, and being within a cohort of other CNFs.

> Participant 1: the mentor has been really supportive which has helped me put myself out there and get noticed by senior nurses and consultants... feel that it gives you a spotlight to say look I am here, I can do these things and then you get more opportunities.

Additionally, participants commented that through attending conferences and meeting people with similar areas of interest to them, visiting other Trusts to see their practices and joining clinical groups such as the Long-Term Conditions Group, helped them to develop their working practices and working connections.

> Participant 4: the networking helped to push me out my comfort zone massively ... It's been big for my personal development.

It was noted that participants did not feel that the opportunities for these developments would have been available had they not had the exposure to the networking as part of the scheme. Furthermore, participants commented that it was also the exposure to people within different career areas that enhanced their ability to explore their own development. Being able to make connections with people to ask questions and gain guidance appeared to be a facilitating factor in career development for participants. This was emphasized by participants as being important because there were no national pathways for career development. For instance, an example was given that within the Emergency Department, a more "natural progression" (Participant 2) was to advanced clinical practice and that for participants who did not want to go into that, it was harder to explore other options unless there were role models in their clinical area.

The second factor was a combination of understanding the broader picture within the Trust and feeling part of a network.

Participants commented that the exposure through networking made them realize why things were happening and that "there was a reason for all of this" (Participant 4) and the effort that the Trust was putting in to making things better for staff. Participants commented that this made them feel more connected and "plugged in" (Participant 5), that it allowed them to realize that they had more influencing power and that made them feel part "something bigger" (Participant 7). In some cases, it cultivated a stronger sense of wanting to stay in the Trust as a result.

> Participant 2: ... if you don't have those embedded connections and people that you can go to and that network that exists, I feel like you just flounder...

Finally, participants felt that they gained a greater sense of empowerment through the interconnected impact of the CNF scheme, which helped to dispel some of the ingrained hierarchy structures within the organization. This helped participants to feel that they gained greater confidence to challenge and raise concerns.

> Participants 1: It felt less like [referring to the clinical nursing directors] that was them up there, and this was me down here

> Participant 6: [the CNF] helped me to realise the influencing powers nurses have on a day-to-day basis

4 | DISCUSSION

The findings from this study suggested that the CNF had a positive influence upon personal and professional development, and the retention of participants was noted to be mediated by the presence of career development. This came in the form of participants being able to gain an awareness and opportunity to explore different career options. Furthermore, the creation of networks and networking through the CNF appear to have been an influential facilitating aspect from the view of participants in developing them professionally and personally, while enhancing their career development and retention prospects. Additionally, although the CNF cannot be solely responsible for retention, it appeared to have a positive effect on participants' views of the Trust and the ability to enhance their development. Overall, the CNF appear to have positively influenced the retention intentions of participants. Since this study was undertaken, the COVID-19 pandemic has had a significant impact on nurse turnover and retention, with research highlighting stress and burnout as a significant factor (Falatah, 2021). Just prior to the pandemic, the 2020 cohort of 24 CNFs were recruited, and further research is required to understand this programme in a post-pandemic system.

As social capital is considered to be the connections, knowledge and resources embedded within networks of relationships, the

benefits of network and networking that participants expressed can be considered social capital and appeared to be a core part of facilitating positive retention intentions of nurses from the CNF. As social capital is noted in this study to be a key factor, it could be considered by nurse managers in the development of talent management schemes to help contribute to their organization's retention strategy. In this discussion, the facilitating presence of social capital will be considered in relation to retention.

Although career development and progression were recognized to be individual decisions pivotal to retention intentions, it was the presence of networks and networking in this study which contributed to the increase in awareness of careers, and, in turn, increased the feelings of loyalty and value expressed by participants. This sense of job satisfaction resulting from social capital has previously been shown to lead to positive retention outcomes in nursing (Read & Laschinger, 2015), and nurses' workforce social capital is indicated to hold positive consequences for nurses, their patients and health care organizations (Xu et al., 2020). At the time of writing there is no literature available linking social capital, talent management and retention in nursing, making this paper the first one to do so. However, there is research from fields outside of nursing that indicate that social capital and talent management are interconnected (Walker, 2020).

Building on the facilitating nature of social capital, research suggests that NHS Trusts could enable high-quality patient care and safety through empowering the nursing workforce and enhancing their wellbeing (Ellis & Gates, 2005). An aspect of an empowering environment that enables this is the flow of knowledge among nurses, leadership, and other multi-professional teams. Additionally, structural conditions such as access to information about the organization and the ability to achieve professional development at work contribute to nurses feeling empowered (Linnen & Rowley, 2014). The CNF scheme enabled exposure to information on the organization and helped career developed for participants, for example by exposing participants to leadership and organizational decision-making processes, strategy development and various career opportunities available.

The facilitating presence of social capital relates to the importance of structural empowerment, which is a core component of retention (George, 2015; Read & Laschinger, 2015). Structural empowerment focuses on the organizational structure and personnel polices from human resource management, including talent management (George, 2015), which nurse managers can contribute to. It focuses on employees being involved in decision-making to address areas for improvement. The concept of structural empowerment also attends to the influence leaders can have on professional practice by creating an environment that supports collaboration, which is indicated in positive retention outcomes for nurses (Halter et al., 2017). This collaborative requirement is what the CNF produces through the facilitation of networking and the creation of networks within the organization.

As an NHS Trust is a knowledge-intensive organization, nurse managers should be aware that a key part for its success is the ability for knowledge to be transferred and shared. This requires social capital because human capital is not owned by organizations (Nahapiet & Ghoshal, 1998). Therefore, as individuals can leave, and take their human capital with them, organizations may incur a 'capital loss' because the knowledge may not be transferred or shared (Youndt & Snell, 2004), but social capital can help to distribute knowledge. Critically, the presence and development of tacit knowledge is important for facilitating these networks because tacit knowledge involves interpersonal skills, such as communication, which is vital to the sharing and transfer of knowledge. In this study, the CNF develops tacit knowledge including the development of presentation and teaching skills. These types of skills are vital to the development and transfer of knowledge; thus, helping to build social capital, and therefore the CNF scheme can help to reduce the risk of capital loss to nurse managers and the organization through positively enhancing retention intentions.

However, nurse managers should also be aware that there are barriers that can make the transfer and sharing of knowledge difficult. According to Youndt and Snell (2004) and Bratianu (2017), these include hierarchical and horizontal barriers, and strategies to alleviate these barriers include fostering egalitarian and collaborative human resource management configurations. This study indicates that incorporating social capital in talent management initiatives may help to alleviate these barriers. An egalitarian approach considers the need to reduce power distances within an organization through, for example, empowering individuals. Within this study, participants reported that undertaking the scheme made them feel more empowered and realize the impact nurses can have within an organization. These benefits further relate to the concept of the professional voice and wellbeing.

In terms of overcoming horizontal barriers to knowledge sharing and transfer, Youndt and Snell (2004) suggest collaborative human resource management practices, which can be achieved through work structures that promote network intimacy. The CNF scheme facilitates this, as participants reported that they had a greater understanding of how and why the Trust operated, which contributed to them having a greater appreciation for the Trust and the leaders that were trying to retain them. This subsequently made participants feel greater commitment towards the Trust, which subsequently made retention intentions more positive. The contribution of networking, and networking within talent management initiatives and retention, has not been extensively researched. Therefore, this study adds to the talent management literature, and the importance of talent management with network and networking for nurses' retention intensions. The difference between this and other studies is also that although talent management has been used in other sectors such as business, it is only an emerging concept in nursing, and Haines (2016) states that talent management approaches in nursing require evaluation, which is what this study presents, especially for nurses who are not senior leaders. This study demonstrates that talent management is a useful approach for early career nurses, not least as a retention intervention. Therefore, the contribution of this study is in describing a talent management approach in nursing which may have significant implications for retention of early career staff. Nurse managers when considering a

talent management approach should think about including social capital with networks and networking within their initiatives to encourage positive retention intentions.

4.1 | Limitations

This study has been carried out on a small sample of nurses. While the outcomes positively highlight the impact of this talent management programme for the individuals interviewed, these are focused on an acute trust only and may differ across other health care settings. Moreover, this scheme has so far only been undertaken by 'junior' grades, and thus, there may be differences of outcomes if 'senior' grade nurses undertook the CNF.

5 | CONCLUSION

This paper has presented how a talent management scheme may influence nurses' retention intentions. The findings suggest that participants gained a range of professional and personal development because of the talent management initiative. The talent management scheme did have a positive effect on participant's views of the organization, which could improve retention intentions. A core influence on retention from within the talent management initiative was the presence of networks and networking. The networking can be viewed as a form of social capital, which stood out in these findings as being a facilitating factor between retention and career development.

With further research of the combination and interlinking of social capital within talent management initiatives in nursing, a greater understanding may be able to inform future developments. Exploring this approach; especially post pandemic, may assist nurse managers in developing retention strategies for nurses in a range of organizations and across different countries. Enhancing retention is one way of addressing NHS nursing shortages, which this talent management initiative could potentially contribute to.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

This paper suggests that networks and networking, considered here as social capital, may function as core facilitating aspects in helping to promote retention intentions for nurses within a talent management initiative. Thus, when creating or developing talent management schemes, nurse managers should give thought to how networks and networking are embedded within such initiatives for early career staff. Finally, there is the potential to advance the CNF scheme out to mid or late-career nurses, and it may be possible to establish if the same focus on networks and networking are emphasized by these group of nurses. This may help nurse managers to develop a broader, and more in-depth talent culture within their organization.

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ORIGINAL ARTICLE

Understanding the gender gap in advanced practice nursing: A qualitative study

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Abstract

Aims: We aim to explore the perceptions of registered nurses undergoing the advanced practice nurse preparatory programme and of advanced practice nurses towards the recruitment of men into the advanced practice nursing workforce.

Background: Given the need to expand and diversify the advanced practice nursing workforce, it is important to recognize the potential implications of gender disparity. It is critical to understand why few males are recruited into the advanced practice nursing preparatory programme and to determine whether gender-related bias is present in the professional development of nurses.

Method: We use a descriptive qualitative design. Semi-structured interviews were conducted via Zoom (April to August 2021).

Results: Three themes were generated: 'The odds are eventually in the favour of men', 'The APN career-track is unpopular among men', and 'Balancing the gender gap in the APN workforce'. All themes are supported by three subthemes.

Conclusions: Although males in nursing enjoy opportunistic advantages in entering the advanced practice nursing workforce, they are not interested in the role and not staying long enough in the nursing profession to become advanced practice nurses.

Implications for Nursing Management: Nurse managers should be more cognizant of the different social stereotypes faced by males and females in nursing. With such awareness, they can be more supportive and less biased in career counselling and job appraisals.

KEYWORDS
nurse practitioners, nursing image, recruitment, workforce

1 | INTRODUCTION

Gender disparity has long been noted in nursing, a predominantly female-dominated profession (Barrett-Landau & Henle, 2014). Across the world, males comprise only 11% of the nursing workforce (World Health Organization, 2020). This is unsettling because an accurate representation of the general population's demographic composition is integral to any profession. Furthermore, such disparity is of concern especially in view of the global shortage of nursing staff: The World Health Organization (2021) has forecast

a global shortfall of 9 million nurses to meet population health needs by 2030.

In Singapore, gender disparity has persisted. Although the number of male nurses has risen with time, the pace is not encouraging: their proportion among registered nurses (RNs) has only increased from 8.2% in 2008 to 11.6% in 2020 (Singapore Nursing Board, 2021). The phenomenon is also true among Singapore's advanced practice nurses (APNs), who are nursing leaders spearheading patient care with demonstrable clinical contributions (Laurant et al., 2018; Smits et al., 2020; Woo et al., 2017). The proportion of males among APNs remains disproportionately low: they currently account for less than 5% of the APN workforce (Singapore Nursing Board, 2021).

1.1 | Men in nursing

Nursing being a female-dominated profession has precipitated men in nursing to experience gender role conflicts, stereotypes, and challenges in educational and clinical settings (Younas et al., 2019; Zeb et al., 2020). Men in nursing started encountering such negative experiences while they were students. One common assumption held by many is that men who end up pursuing nursing are only doing so because they are not bright enough to become doctors (Brody et al., 2017). Often, they are also questioned about their sexual orientation (Brody et al., 2017). As a result, male nursing students reportedly have concerns and uncertainties about becoming a nurse. They fear poor acceptance of male nurses among healthcare colleagues and patients would negatively impact their career prospects (Younas et al., 2019; Zeb et al., 2020).

Stereotypes about masculinity have influenced nursing care assignments in clinical practice. Men in nursing are expected to work in fast-paced clinical environments, such as intensive care units or emergency departments, where there is more heavy lifting (Cheng et al., 2018). Men are also thought to be better suited for psychiatry settings where their physical strength would be helpful in managing patients who are at risk to themselves and others (Jordal & Heggen, 2015). In some contexts, men are outrightly precluded from caring for female patients (Zeb et al., 2020). These role expectations can marginalize and cause a strain among men in nursing (Smith et al., 2020).

To avoid gender role conflicts and discrimination, some men become nurse educators. Although these men received more respect and appreciation as educators, they still feel compelled to constantly prove their worth and improve themselves. These feelings stemmed from prejudices engrained in the nursing culture against male nurses (Zeb et al., 2020). Over time, these issues men face in nursing could culminate and result in feelings of isolation, stress, and burnout (Carnevale & Priode, 2018). These could negatively impact retaining men in nursing (Rajacich et al., 2013).

1.2 | Recruitment of APNs in Singapore

In Singapore, APNs are Masters-prepared nurses with a professional licence to practice beyond an RN's fundamental scope of practice. The role of an APN in the context of Singapore represents a hybrid between that of a nurse practitioner and a clinical nurse specialist (Woo et al., 2019). Additionally, some APNs have collaborative prescribing authority (Ministry of Health, 2018).

Currently, the Singapore Nursing Board oversees the APN practice and licensure, the prerequisite for which is a formal preparatory training. This comprises an 18-month Master of Nursing programme at the National University of Singapore and a 12-month supervised internship under a provisional licence (Singapore Nursing Board, 2020). Upstream enrolment of RNs into the Master of Nursing programme requires endorsement and recommendation from their nursing leaders (besides minimum academic requirements and clinical experiences) (National University of Singapore, n.d.). An aspect unique to Singapore is that such matriculated RNs will enter an employment bond with their healthcare institutions, under which they are thus expected to develop their careers as APNs. Accordingly, nursing leaders are crucially involved in selecting RNs for APN practice (Woo et al., 2020).

A robust nursing workforce is critical to attaining universal health. Thus, there has been an ongoing interest to recruit more APNs to strengthen the APN workforce, as demonstrated by the aim of Singapore's Ministry of Health to double the number of APNs by 2030 (Begum, 2021). Accordingly, expanding the APN workforce entails addressing the gender disparity, especially given the evolving healthcare and sociocultural landscape (Thompson et al., 2020). Moreover, diversifying the APN workforce translates into the practical utility of tapping into the male population for their expertise. This builds a more gender-inclusive environment for males and ultimately improves patient care and experiences (Smith et al., 2020).

Given the need to expand and diversify the APN workforce, it is important to recognize the potential implications of gender disparity. Therefore, it is critical not only to understand why few males are recruited into the APN preparatory programme but also to determine whether gender-related bias is present in the professional development of RNs. Furthermore, it may be propitious to understand if men are staying long enough in nursing to become APNs. Such findings are envisioned to provide practical insights into potential solutions to address gender disparity.

1.3 | Aims

Accordingly, this inquiry aimed to explore the perceptions of RNs undergoing the APN preparatory programme and of APNs towards:

i. the shortage of men in the APN workforce;
ii. the selection and recruitment of men into the APN preparatory programme; and

iii. the influence of having more men in the APN workforce on the professional image of nursing in Singapore.

2 | METHODS

2.1 | Study design

A descriptive qualitative design (Polit & Beck, 2012) was adopted. Participant recruitment, data collection, and data analysis were iteratively performed to explore diversity from the nurses' perspectives. Additionally, this study adhered to the 32-item Consolidated criteria for Reporting Qualitative research (Tong et al., 2007) (Appendix S1).

2.2 | Setting and sample

Singapore, a city-state with a total population of 5.45 million people and a population density of 7485 people per square kilometre, was the study setting (Singapore Department of Statistics, 2022). There are 35,948 RNs (32,621 in active practice) and 330 APNs (327 in active practice) in Singapore (Singapore Department of Statistics, 2022).

The participants were purposively sampled. Included in this study were consenting male and female registered APNs, APN interns, and Master of Nursing students aged 21 years and above. Within the context of this study, the term 'APNs' refers to nurses who have completed all aspects of the formal APN preparatory training. 'APN interns' refers to Master of Nursing graduates in the midst of their 12-month supervised internship under a provisional licence. Finally, 'Master of Nursing students' refers to RNs receiving formal APN education at the university. Participants must have access to a personal computer or mobile device with microphone and camera functions. APNs, APN interns, or Master of Nursing students who refused to have their interviews audio-recorded or their web cameras turned on during the videoconference were excluded.

Electronic invitation letters with information about the study were disseminated via email to all the National University of Singapore Master of Nursing alumni by the programme administrator. In addition, interested alumni were requested to contact the study team via email. The study team would then respond and arrange a mutually convenient time to go through the consent process and conduct the interview. Snowballing sampling was also adopted. The study team also received referrals from the study participants.

2.3 | Data collection

Each consenting participant then took part in a single session, individual, semi-structured interview through videoconferencing (Zoom) between April and August 2021 with one of the authors (B. W., Female, PhD-prepared). During the interviews, web cameras and microphones were set up so that the researcher and participants could see and hear each other (including the participants' non-verbal cues). The researcher had no prior relationships with the participants.

With a flexible interview guide, the researcher explored the participants' perspectives towards males in the APN workforce. Examples of the questions were: 'Why is there an under-representation of males in the APN workforce?' and 'Do you think nursing leaders take into consideration the gender of the RN when nominating him or her for the MN programme?'. The interviews were audio-recorded and transcribed in verbatim, ranging from 48 to 64 min (median = 54 min).

2.4 | Data analysis

Data analysis and data collection took place in parallel and complemented each other. During data analysis, no new information and codes were generated between the 15th and 16th interviews. It was then the study team agreed that data saturation was achieved (Green & Thorogood, 2004). Accordingly, recruitment concluded at the 16th interview. Following this, thematic analysis, guided by Braun and Clarke (2006), was undertaken inductively, with the themes and subthemes being extrapolated from the data rather than from existing conceptual frameworks or theories (Fereday & Muir-Cochrane, 2006).

When generating codes across the data corpus, some techniques from the grounded theory were used (Charmaz, 2014). The techniques included line-by-line coding of the interviews transcribed in verbatim, discussions among study team researchers about emergent codes and deviant cases, and adopting a constant comparative method (Strauss & Corbin, 1990). The researchers read the interview transcripts and listened to the audio-recordings repeatedly to gain familiarity with the data. Next, codes were refined and arranged into potential themes and subthemes using a semantic approach. The themes and subthemes were assessed if they cohere meaningfully with the codes and data corpus. Subsequently, the themes and subthemes were refined and defined (Braun & Clarke, 2006). The constant comparative method was undertaken in coding, developing, reviewing, and defining themes. The relationships between and within each theme were compared (Strauss & Corbin, 1990). Discussions continued until all the researchers (B. W., G. Y. S., and Z. W.) agreed on the final themes and subthemes (Braun & Clarke, 2006).

2.5 | Rigour

To ensure the rigour of our study, criteria for authenticity and trustworthiness were upheld (Guba & Lincoln, 2018). Authenticity was ensured by exercising fairness, demonstrated by assigning equal consideration and weight to every participant's insights (Guba & Lincoln, 2018). Trustworthiness involves credibility, dependability, confirmability, and transferability. Each interview lasted more than 30 min to ensure credibility, allowing prolonged engagement with the participant. Additionally, to enable triangulation, the data analysis was undertaken by three researchers (B. W., G. Y. S., and Z. W.).

Furthermore, member-checking followed the interviews, involving four consenting participants with contrary perspectives: They were first presented with the preliminary themes, subthemes and participants' quotes. Then, they were requested to examine the representativeness of their views (Birt et al., 2016). To ensure dependability and confirmability, the interview transcripts were checked by researchers not involved in transcription. Throughout the data analysis, an audit trail was kept alongside field notes and reflexive annotations to record the researchers' tendencies and intents. Lastly, to permit readers to determine the transferability of this study, the participants' socio-demographic characteristics, verbatim quotes, and relevant contexts were provided for their appraisal.

3 | FINDINGS

3.1 | Demographic profile

Of the 16 participants recruited (eight males and eight females), the majority were Chinese (n = 13) and were married (n = 12). Their ages ranged from 29 to 43 years (median = 36 years), and their nursing experiences ranged from 6 to 20 years (median = 11 years) (Table 1). Six were Master of Nursing students, three were in the midst of their APN internships, and seven were APNs. All but two of them were working with adult patients.

3.2 | Thematic findings

Three themes were generated, each of which was, in turn, supported by three subthemes that further illustrated the participants' perspectives towards the selection and recruitment of males into the APN workforce (Table 2).

3.2.1 | Theme 1: The odds are eventually in the favour of men

The participants shared that there was no gender preference in the selection and recruitment of APNs into the workforce. However, they opined that males might enjoy opportunistic advantages over females in the selection for the APN candidature.

Subtheme: Objectivity in the selection process
In general, there is a stipulated set of objective criteria for selecting nurses for the formal APN preparatory education. According to the participants, any nurse might express their interest in the APN track to their direct reporting officers (usually the nurse managers or nurse clinicians of their wards or clinics). Following this, the managers or clinicians would submit a nomination for the interested nurse. Some participants shared that their institutions made application forms available on the intranet for interested nurses. Others added that potential candidates in their institutions were to be assessed for

TABLE 1 Participant characteristics (n = 16)

Demographics	n
Age (years)	
Median (range)	36 (29–43)
Gender	
Female	8
Male	8
Race	
Chinese	13
Indian	2
Malay	1
Marital status	
Married	12
Single	4
Nursing work experience (years)	
Median (range)	11 (6–20)
APN career stage	
MN student	6
APN intern	3
APN	7
Highest level of education	
Master's degree	10
Bachelor's degree	5
Post-graduate diploma	1
Current job title	
Senior staff nurse	8
Assistant nurse clinician	1
Nurse clinician	3
Senior nurse clinician	3
Assistant director of nursing	1
Work setting	
Adult inpatient	6
Adult acute care (ICU or ED)	4
Paediatrics (inpatient)	2
Mental health (inpatient)	2
Mental health (inpatient, outpatient and community)	1
Adult inpatient and outpatient	1

Abbreviations: MN, Master of Nursing; APN, Advanced Practice Nurse; ICU, intensive care unit; ED, emergency department.

clinical acumen and critical thinking through short assessments known as Multiple Mini Interviews:

> ... the selection process is objective because we use the MMI [multiple mini interviews]. So, it is an objective way to assess the clinical ability of a nurse. So, it is a voluntary kind of sign up like whoever is considering to become an APN, they just need to sign up. Basically, everybody has equal chance ... *[sic]* (P8, Female, APN)

TABLE 2 Themes and subthemes

Themes	Subthemes	Quotes
The odds are eventually in the favour of men	Objectivity in the selection process	'I do not think nursing leaders will take into account the gender. I think they look more into GPAs, so like they will consider your education background, and you are your contributions to the organisation, and how well have you performed. You have to score A for 3 consecutive years for your work appraisal and your GPA must be 3.2 and above. *[sic]*' (P16, female, MN student) 'I think it depends more on their academic results, their calibre and suitability for the APN role rather than gender issue *[sic]*.' (P13, male, APN)
	Differing gender-specific role expectations in the family	'That [the need to defer plans to get pregnant] caused one of the potential candidates actually to turn down the offer [to enter the MN programme] … ambiguity to when she can start family planning caused her to withdraw from the programme and prioritise family planning over, umm, the APN programme. *[sic]*' (P1, male, student) '… when they [women] have to deliver [the baby], of course, they will be unable to carry on with their studies. So, they either have to postpone it, or some of them, if they cannot cope with their family, their kids, I'm not sure whether they need to withdraw from the programme. But this is not part of my considerations. *[sic]*' (P3, male, student)
	The inevitable 'glass escalator'	'I feel like even though male nurses are the minority, there's certain advantage. So, I've seen male nurses if you [men] are good right, you are recognised more easily than your female counterparts because they [men] are so scarce, right? So, if one stood out, that person have more opportunities compared to his peers who are female, because he just stands out more easily. He's male and he can just outshine … he just managed to, in a way, get the upper hand. *[sic]*' (P4, female, intern) 'The career progression [of men] is smoother, as long as they do not cause a kerfuffle at work. *[sic]*' (P1, male, student).
The APN career-track is unpopular among men	Gender-stereotyped attributes influencing career choice	'… stereotype that males have better management style because they are more task-oriented and less emotional in their decision making makes male nurses better nurse managers. *[sic]*' (P1, male, student) 'I somehow think it is better for males to become managers. Males are less reactive in a lot of circumstance, so always give people the vibe that they are a bit more cool-headed. So, I think that is a good leadership quality … more cool-headed, less reactive. So, I feel that males usually in the female environment they tend to have a better head start. I feel male have a better head start of the management or leadership pathway. *[sic]*' (P5, female, student)
	Sacrifices in renumeration and career progression	'… by the 4th year, you are just starting to craft your role as an APN … compared to the regular RNs who stay in clinical and continue to provide their service [to the organisation]. Definitely, there will be more opportunities for them [regular RNs] to get promoted compared those who decided to go for the MN programme. *[sic]*' (P9, female, APN) 'After you graduate as an APN, your increment around 400 to 450, right? But you spend almost three years to struggle with this [MN] program. But if they [RNs] stay in the clinical area, if they promote as an NC [nurse clinician] or ANC [assistant nurse clinician], they can get seven hundred dollars … one of my NC currently in my ward, he does not want to go to be an APN. He went to study a masters of management in one of those private universities. He thinks, 'why do I need to struggle? My pay going to increase more than your salary.' *[sic]*' (P14, male, intern)
	Gender-based stigmatisation of nursing	'I have brothers. If I were to ask my brothers to consider nursing as a profession, they would say, 'oh, it's a girl's job.' So I mean, as much as I do not want people to think that way, but I cannot, you know? It's something is in-built in them that nursing is very feminine, cannot have men in doing the job. Then any men who is in nursing are thought to be feminine and not masculine. *[sic]*'(P15, female, intern) '… in Asian countries, maybe China and Taiwan, I think there is still this mindset that being a nurse is still a female-dominated work. *[sic]*' (P3, male, student)
Balancing the gender gap in the APN workforce	Male APNs are a 'good-to-have' and not a 'must-have'	'There is not really anything different what male and female APNs are doing. That is quite awesome. *[sic]*' (P12, male, APN) 'I think there are some ways where guys think a little bit differently from females … I think we appreciate the way how different people think … a team cannot be of the same character or same personality or the same way of thinking because you will not have change, you will improve. *[sic]*' (P7, female, APN)

(Continues)

RIGHTS LINK

TABLE 2 (Continued)

Themes	Subthemes	Quotes
	Good role models and better articulation of the role	'… seeing how our APN seniors work is an inspiration to us. We see how they are equipped with masters and being APN, they do more for our patients. They have little bit more autonomy at work. APNs can make certain decisions without needing to ask permissions from doctors … more autonomy in terms of providing care. [sic]' (P13, male, APN) 'There are still a lot of questions revolving around what is the service that they [APNs] provide … they have to differentiate themselves from the nurse clinicians … it requires quite a lot of pioneering kind of work to tell your colleagues what your role as an APN is and what you are working for. [sic]' (P7, female, APN)
	'De-gendering' the gendered stigmatisation of nursing	'[having more men] dispels the social stigma of nursing being an effeminate job. [sic]' (P5, female, student) '… we do need a male representative to show that our job, there is nothing soft about it. There's nothing feminine about it. It's actually very tough. So having a guy in the APN profession or to represent nursing or to represent APN can actually show people, 'oh nursing is not an easy job. It's can be a masculine job.' It actually takes lots of guts and lots of IQ [intelligence quotient] and EQ [emotional quotient]. [sic] (P15FI)

Additionally, the participants remarked upon the need for interviews with their nursing leaders and Human Resource personnel. During these interviews, candidates would be evaluated for not only their understanding of and interest in the APN role but also their suitability for it. The need for APN-led services in a given specialty was usually examined as well:

> … although you are may be interested in a certain area but that area of expertise may not require an APN … they [nursing leaders] said, 'These are the few disciplines that we are currently accepting APNs. Do you feel you are interested in any of these?' [sic] (P2, Male, student)

In sum, the selection and assessment of the candidates by the nursing leaders and administrators were reported by the participants to be independent of the candidates' gender.

Subtheme: Differing gender-specific role expectations in the family

According to the participants, during the selection interviews, the candidates were frequently asked questions related to their families and the need for help at home while they embarked on the APN preparatory training:

> … am I married, single? Do I have children? Who is looking after the children? Am I or will I be occupied with family? [sic] (P6, Male, Student)

> they were very concerned [that I have a toddler]. One of the interview questions I got asked, I think twice, was whether or not I am able to cope with being a mother and a full-time student. That's the question they [nursing leaders] asked during the interview. [sic] (P15, Female, Intern)

Given its intensive nature, the APN preparatory training was known to demand full commitment from the candidates and might even require time away from their families. Hence, family support was deemed an important contributor to the successful completion of the programme. In this regard, married female candidates were strongly encouraged to delay plans of pregnancy because it might disrupt the training. Additionally, the prospect of making adjustments to family life was opined to deter females from pursuing the APN career track because of their role in their family: they were thought to be more 'family-orientated' and less 'career-focused' than males (P13, Male, APN). Moreover, 'societal pressure [persisted] for men to be the main breadwinner' (P4, Female, Intern) and for women to bear the responsibility of childbearing.

Subtheme: The inevitable 'glass escalator'

Because nursing was a female-dominated profession, males who joined nursing would tend to stand out and be more prominent than females, as shared by the participants:

> … they [men] also understand that they are more outstanding as males you know, so for example, just within a ward, there's probably going to be only two or three males … Whatever they do is being magnified, if they have a compliment, wow, everybody knows right? [sic] (P5, Female, Student)

Against such a background, the participants observed that males appeared to be recognized and appreciated more often than females for any given work of similar quality. Furthermore, the participants added that males' opinions appeared to carry more weight than females' in their work environments. Moreover, being the minority in the nursing workforce caused them to receive unintended advantages over females in career advancement. Such observations led to the participants' view that male nurses were on a 'glass escalator' and

enjoyed accelerated career progression; thus, they were more likely to be identified as potential candidates for the APN career.

3.2.2 | Theme 2: The APN career-track is unpopular among men

Interestingly, though the odds were seemingly in their favour, male nurses were noted to lack interest in becoming APNs. Several factors might have made the APN career less appealing, especially to males.

Subtheme: Gender-stereotyped attributes influencing career choice
Males were generalized to be decisive, analytical, authoritative, and composed, based on which they were thought to be good candidates for leadership roles. Conversely, females were described as nurturing, detail-oriented, and emotionally-driven:

> … we have some men who are natural leaders, born to be leaders-type *[sic]* (P7, Female, APN)

> [institutional leaders] choose men for very big positions like managerial roles … maybe we are females, we are more emotional, I'm a female myself. I can be emotional but males they can control their emotions very well. *[sic]* (P16, Female, Student).

Given such perceived personality traits, the participants opined that males in nursing tended to gravitate towards more managerial and leadership-related career tracks and away from more clinical and education tracks within their organizations. Conversely, the minority of males who did join the APN workforce were usually motivated by their strong interest in clinical work and opportunities to develop further in clinical knowledge and skills. They also saw the APN career track as an opportunity to exercise clinical leadership.

Subtheme: Sacrifices in remuneration and career
As aforementioned, all APN candidates would require nomination and funding from their institutions. Although still technically employed by their institutions during the Master of Nursing programme and internship (which spanned about 3 years), most APN candidates experienced minimal salary increments and would not be considered for any promotions:

> … the problem is during our [Master of Nursing] studies, we do not get promoted. Whereas your peers that join [the nursing workforce] the same time as you gets promoted. I think that's a very big deterrent for most nurses, not just males, both males, and females. We do hear a lot of unhappiness about it. *[sic]* (P10, Female, APN)

Apart from these possible impacts on remuneration and promotion, uncertain career prospects and academic stringency further deterred nurses from becoming APNs. Nurses were concerned with the lack of clear career pathways for APNs, especially compared with the four more structured, conventional career pathways in nursing (clinical, management, education, and research). They might feel more inclined to choose a more structured pathway for which there were established performance indicators. Moreover, educational requirements for the other tracks were more flexible: in some institutions, it was not mandatory for nurse managers, nurse clinicians, nurse educators, or nurse researchers to be Masters-holders. In sum, although these considerations would be common to both genders, males appeared to be more affected by this, because of expectations on them to provide for their families:

> … for guys, opportunity costs and salary are very important. They must support the family. *[sic]* (P5, Female, Student)

Subtheme: Gender-based stigmatization of nursing
The participants shared that, given the widespread perception of nursing as an effeminate job, males in the profession were often described with attributes carrying unpleasant connotations:

> "It doesn't have that prestige. You tell your relative 'I'm a nurse', they say 'huh? You're a male, why are you a nurse, are you a sissy?'. Quite sadly, people also do not see nursing as a profession. *[sic]* (P12, Male, APN)

Coupled with the public's negative perceptions, such gender-based stigmatization of nursing led to low morale among male nurses, who were apprehensive about their career longevity in nursing, as shared by the participants. Consequently, they did not feel the need to develop further in their nursing career, such as the pursuit of the APN career track. Some even eventually left nursing for another profession:

> … some of the guys went to medical school, and some of them went to do property [real estate agents]. Some of them went to become insurance agents. Most of my [male] friends, they venture into business. *[sic]* (P12, Male, APN).

3.2.3 | Theme 3: Balancing the gender gap in the APN workforce

The participants did not find males' lack of interest in the APN career track concerning. Nonetheless, they did see value in disrupting the status quo of their low numbers in the APN workforce.

Subtheme: Male APNs are 'good-to-have' and not a 'must-have'
The scarcity of males in the APN workforce was not perceived to be unsettling. During the discussion on recruiting males into the

APN workforce, one participant commented that having more male APNs 'is not a must-have but more of a good-to-have' (P10, Female, APN). Such a view was shared by most other participants because the gender of the APN hardly influenced the scope and outcomes of practice:

> I feel it [gender of the APN] doesn't really matter. Because what we [APNs] do, our scope of practice, is the same for both male and female APNs. [sic] (P11, Male, APN).

Instead, there was a general need to recruit more committed and passionate APNs, both males and females:

> … we need more APNs rather than need more male APN. [sic] (P13, Male, APN)

> it really depends on whether they have that, in Chinese we call it, 心和力 [passion and commitment] you know? Like they have that commitment and that passion to take on the role of the APN … doesn't need to be male or female … [sic] (P7, Female, APN)

Nevertheless, there was consensus among the participants that it would be healthy to have gender diversity within the APN workforce. With males and females perceived to have gender-specific traits and strengths, gender diversity within the workforce could promote better exchange of ideas:

> … regardless of profession, it's always good to have a gender balance because different genders bring different characteristics. [sic] (P4, Female, Intern)

Subtheme: Good role models and better articulation of the role

To address the gender disparity in the APN workforce, the recruitment of males should be improved. Many participants cited the lack of role clarity as a deterrent for males to pursue the APN career track. It followed that exemplary APN role models would inspire early-career nurses to become APNs themselves:

> They'll [early career nurses] be like 'oh, what a good role model. I look forward to becoming like that!' … we have a male APN in our institution, everybody looks up to him because of the knowledge that he has to offer … the amount he has to teach. But I think his gender plays a part as well. Having a male APN does impact the number of people who wants to join the APN course. [sic] (P16, Female, Student]

To improve role clarity of APNs, the participants advocated the need to more accurately publicise and 'rebrand' it as a 'knowledge-intensive occupation':

> APNs should be advertised in Singapore as nurses who have the knowledge and skills that go beyond making people feel better. APNs have the clinical expertise and it is a knowledge-intensive occupation. I think this can attract more men into the nursing profession … it's not just about us being caring, it is a knowledge-intensive occupation. [sic] (P4, Female, Intern)

Subtheme: 'De-gendering' the stigmatization of nursing

Through better gender diversity within the APN workforce, the participants believed that the stigma of nursing being an effeminate job would be reduced and that nursing would be viewed as an inclusive profession with diverse demographics:

> … it tells people we are more open to having different types of people perform what used to be a very feminine role within the healthcare system. [sic] (P10, Female, APN)

With greater inclusivity in the APN workforce, patients, the public, and even healthcare colleagues would notice that males were developing professionally and thriving in nursing. This might contribute to reducing the gender-based stigmatization of nursing.

> If they have more male representation in the APN workforce, when patients visit the hospital, they see men doing a wonderful job in the hospital and are impressed by their care received during their hospital stay. Subsequently, the patient will change their perspectives about nursing. [sic] (P6, Male, Student)

4 | DISCUSSION

At present, this qualitative inquiry is the first of its kind in Asia to explore the gender disparity and recruitment of males in the APN workforce from the perspectives of males and females pursuing or in the midst of their APN careers. This study shares important insights into addressing the gender gap in the APN workforce.

Much of the existing literature drew attention to the discrimination men experience, in the form of gender role conflicts and stereotypes, throughout their nursing career (Brody et al., 2017; Younas et al., 2019). Interestingly, in this study, although gender-based stigmatization of nursing is ascertained as a longstanding issue in Singapore, men in nursing did not seem to experience discrimination with regard to professional development. Instead, males in nursing appear to be beneficiaries of opportunistic advantages in professional development. Despite the objectivity in the selection of APN candidates, males are more likely to be identified as potential candidates for APN training than their female counterparts. This can be attributed to the dominant role of females in childbearing and caregiving (Holahan, 1994) and is true even among highly intelligent females with

successful careers. A systematic review (Schlegler, 2022) on the professional state of gifted adults has reported that females would experience significant changes in their careers after the age of 35 years. Females were observed either to transit from being gainfully employed before starting a family to becoming homemakers or to remain gainfully employed without much career aspiration. Moreover, gifted females have also been reported to be more likely than gifted males to face trade-off decisions where they had to choose between their career or family: ultimately, they would gravitate towards a career that made allowances for their family planning (Schlegler, 2022). Such literature validates the findings in this study, considering that most RNs start their APN preparatory training in their 30s (Woo et al., 2020).

The term 'glass escalator' first introduced by Williams (1992), describes the underlying advantage men enjoy in female-dominated professions that facilitates their career progression. The phenomenon of such a 'glass escalator' has been underscored in this study. According to a few earlier studies, men may feel different or out of place among their female nursing colleagues but often do not feel discriminated against (Smith et al., 2020; Zeb et al., 2020). Conversely, as the minority in nursing, males have been reported by the participants to be more prominent than their females, and their positive work performances are more likely to be noticed. Such findings are echoed in Asian (Zhang & Tu, 2020) and Western (Smith et al., 2020) nursing populations. Moreover, across cultures, males in nursing have been observed to receive greater recognition from their managers than females. These observations therefore, lead to their favourable positions for career advancements (Smith et al., 2020; Younas et al., 2022; Zhang & Tu, 2020).

To address the 'glass escalator' phenomenon, an obvious implication for the management of staff would be to slow it down strategically (Brandford & Brandford-Stevenson, 2021). However, this is superfluous in the context of APN recruitment of males in Singapore. Elucidated in this study is males' disinterest in the APN role, as explained by the achievement-orientated traits of males such as decisiveness, aggressiveness, independence, and firmness (Heilman, 2001), which are found among males in nursing too. This, therefore, causes them to prefer managerial positions, for which the career progression is more certain, in their organizations.

Ironically, despite the apparent opportunistic advantages of males in nursing, the impact of gender-based stigmatization of nursing remains evident. This longstanding stigmatization makes it challenging for males to adapt to the female-dominated nursing culture, which compromises their delivery of patient care and ultimately reduces their job satisfaction (Finnegan, 2019; Younas et al., 2022). Such negative implications deter males from staying in the profession long enough to become APNs. Therefore, as demonstrated by our findings, addressing the gender gap within the APN workforce fosters a healthier and more inclusive working environment.

As elucidated in this study, experiences for males in nursing are complex, spanning from the privilege of being on the 'glass escalator' to the stigmatization for being in nursing. Although this is so, recruiting more males into the APN workforce may address the general

shortfall in the profession. Addressing this shortfall may inevitably improve nurses' working conditions (Clifton et al., 2020).

Lastly, within the context of this study, nurses have expressed apprehension on becoming APNs because of the lack of role clarity (Woo et al., 2019, 2020). Hence, a delineation of the APN role may facilitate the recruitment of APNs. More specifically, to reduce the stigmatization and encourage gender diversity in the workforce, it may be propitious to have positive male role models mentor nurses (Armitage, 2013). This has also been demonstrated in this study. Intentional mentoring of male nurses through a 'buddy' system and informal meetings may be good avenues for men to share experiences, which can help reduce feelings of isolation and exclusion. Additionally, nursing leaders and administrators should be more proactive in creating a positive and inclusive environment where male nurses are supported and accepted by patients and peers and improve their visibility (Younas et al., 2022). Such strategies are envisioned to retain males sufficiently long in nursing to pursue the APN career.

4.1 | Limitations

One limitation of this study was the purposive sampling of the participants, which was distinctive of qualitative inquiry. Though they were in various APN career stages, the participants were all recruited from Singapore, which may limit the generalizability of the findings to other countries. Nonetheless, the aim of this study was not to generalize but to promote the transferability of knowledge from one context to another. Our findings provide pioneering insights that can be transferred to other contexts in similar stages of APN development.

5 | CONCLUSIONS

Although males in nursing enjoy opportunistic advantages in entering the APN workforce, they are not interested in the role and not staying long enough in the nursing profession to become APNs. This paper offers insights into the poor recruitment of males in the APN workforce and suggestions to combat that. Further inquiry is required to understand how regulatory bodies and nursing institutions may promote a more inclusive environment that reduce gender stigmatization.

5.1 | Implications for nursing management

Nurse managers should be more cognizant of the different social stereotypes faced by males and females in nursing. With such awareness, they can be more supportive and less biased in career counselling and job appraisals. In light of the need to improve APN recruitment, institutional leaders and policy makers need to be more proactive in recruiting RNs into the APN preparatory training. Greater flexibility in the completion of the training for female candidates with children may be advantageous to increasing interest in the APN career. Positive role modelling and clear articulation of the APN role may also

improve the recruitment of both male and female candidates into the APN workforce.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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ORIGINAL ARTICLE

Understanding the gender gap in advanced practice nursing: A qualitative study

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Abstract

Aims: We aim to explore the perceptions of registered nurses undergoing the advanced practice nurse preparatory programme and of advanced practice nurses towards the recruitment of men into the advanced practice nursing workforce.

Background: Given the need to expand and diversify the advanced practice nursing workforce, it is important to recognize the potential implications of gender disparity. It is critical to understand why few males are recruited into the advanced practice nursing preparatory programme and to determine whether gender-related bias is present in the professional development of nurses.

Method: We use a descriptive qualitative design. Semi-structured interviews were conducted via Zoom (April to August 2021).

Results: Three themes were generated: 'The odds are eventually in the favour of men', 'The APN career-track is unpopular among men', and 'Balancing the gender gap in the APN workforce'. All themes are supported by three subthemes.

Conclusions: Although males in nursing enjoy opportunistic advantages in entering the advanced practice nursing workforce, they are not interested in the role and not staying long enough in the nursing profession to become advanced practice nurses.

Implications for Nursing Management: Nurse managers should be more cognizant of the different social stereotypes faced by males and females in nursing. With such awareness, they can be more supportive and less biased in career counselling and job appraisals.

KEYWORDS
nurse practitioners, nursing image, recruitment, workforce

1 | INTRODUCTION

Gender disparity has long been noted in nursing, a predominantly female-dominated profession (Barrett-Landau & Henle, 2014). Across the world, males comprise only 11% of the nursing workforce (World Health Organization, 2020). This is unsettling because an accurate representation of the general population's demographic composition is integral to any profession. Furthermore, such disparity is of concern especially in view of the global shortage of nursing staff: The World Health Organization (2021) has forecast

a global shortfall of 9 million nurses to meet population health needs by 2030.

In Singapore, gender disparity has persisted. Although the number of male nurses has risen with time, the pace is not encouraging: their proportion among registered nurses (RNs) has only increased from 8.2% in 2008 to 11.6% in 2020 (Singapore Nursing Board, 2021). The phenomenon is also true among Singapore's advanced practice nurses (APNs), who are nursing leaders spearheading patient care with demonstrable clinical contributions (Laurant et al., 2018; Smits et al., 2020; Woo et al., 2017). The proportion of males among APNs remains disproportionately low: they currently account for less than 5% of the APN workforce (Singapore Nursing Board, 2021).

1.1 | Men in nursing

Nursing being a female-dominated profession has precipitated men in nursing to experience gender role conflicts, stereotypes, and challenges in educational and clinical settings (Younas et al., 2019; Zeb et al., 2020). Men in nursing started encountering such negative experiences while they were students. One common assumption held by many is that men who end up pursuing nursing are only doing so because they are not bright enough to become doctors (Brody et al., 2017). Often, they are also questioned about their sexual orientation (Brody et al., 2017). As a result, male nursing students reportedly have concerns and uncertainties about becoming a nurse. They fear poor acceptance of male nurses among healthcare colleagues and patients would negatively impact their career prospects (Younas et al., 2019; Zeb et al., 2020).

Stereotypes about masculinity have influenced nursing care assignments in clinical practice. Men in nursing are expected to work in fast-paced clinical environments, such as intensive care units or emergency departments, where there is more heavy lifting (Cheng et al., 2018). Men are also thought to be better suited for psychiatry settings where their physical strength would be helpful in managing patients who are at risk to themselves and others (Jordal & Heggen, 2015). In some contexts, men are outrightly precluded from caring for female patients (Zeb et al., 2020). These role expectations can marginalize and cause a strain among men in nursing (Smith et al., 2020).

To avoid gender role conflicts and discrimination, some men become nurse educators. Although these men received more respect and appreciation as educators, they still feel compelled to constantly prove their worth and improve themselves. These feelings stemmed from prejudices engrained in the nursing culture against male nurses (Zeb et al., 2020). Over time, these issues men face in nursing could culminate and result in feelings of isolation, stress, and burnout (Carnevale & Priode, 2018). These could negatively impact retaining men in nursing (Rajacich et al., 2013).

1.2 | Recruitment of APNs in Singapore

In Singapore, APNs are Masters-prepared nurses with a professional licence to practice beyond an RN's fundamental scope of practice. The role of an APN in the context of Singapore represents a hybrid between that of a nurse practitioner and a clinical nurse specialist (Woo et al., 2019). Additionally, some APNs have collaborative prescribing authority (Ministry of Health, 2018).

Currently, the Singapore Nursing Board oversees the APN practice and licensure, the prerequisite for which is a formal preparatory training. This comprises an 18-month Master of Nursing programme at the National University of Singapore and a 12-month supervised internship under a provisional licence (Singapore Nursing Board, 2020). Upstream enrolment of RNs into the Master of Nursing programme requires endorsement and recommendation from their nursing leaders (besides minimum academic requirements and clinical experiences) (National University of Singapore, n.d.). An aspect unique to Singapore is that such matriculated RNs will enter an employment bond with their healthcare institutions, under which they are thus expected to develop their careers as APNs. Accordingly, nursing leaders are crucially involved in selecting RNs for APN practice (Woo et al., 2020).

A robust nursing workforce is critical to attaining universal health. Thus, there has been an ongoing interest to recruit more APNs to strengthen the APN workforce, as demonstrated by the aim of Singapore's Ministry of Health to double the number of APNs by 2030 (Begum, 2021). Accordingly, expanding the APN workforce entails addressing the gender disparity, especially given the evolving healthcare and sociocultural landscape (Thompson et al., 2020). Moreover, diversifying the APN workforce translates into the practical utility of tapping into the male population for their expertise. This builds a more gender-inclusive environment for males and ultimately improves patient care and experiences (Smith et al., 2020).

Given the need to expand and diversify the APN workforce, it is important to recognize the potential implications of gender disparity. Therefore, it is critical not only to understand why few males are recruited into the APN preparatory programme but also to determine whether gender-related bias is present in the professional development of RNs. Furthermore, it may be propitious to understand if men are staying long enough in nursing to become APNs. Such findings are envisioned to provide practical insights into potential solutions to address gender disparity.

1.3 | Aims

Accordingly, this inquiry aimed to explore the perceptions of RNs undergoing the APN preparatory programme and of APNs towards:

i. the shortage of men in the APN workforce;
ii. the selection and recruitment of men into the APN preparatory programme; and

iii. the influence of having more men in the APN workforce on the professional image of nursing in Singapore.

2 | METHODS

2.1 | Study design

A descriptive qualitative design (Polit & Beck, 2012) was adopted. Participant recruitment, data collection, and data analysis were iteratively performed to explore diversity from the nurses' perspectives. Additionally, this study adhered to the 32-item Consolidated criteria for Reporting Qualitative research (Tong et al., 2007) (Appendix S1).

2.2 | Setting and sample

Singapore, a city-state with a total population of 5.45 million people and a population density of 7485 people per square kilometre, was the study setting (Singapore Department of Statistics, 2022). There are 35,948 RNs (32,621 in active practice) and 330 APNs (327 in active practice) in Singapore (Singapore Department of Statistics, 2022).

The participants were purposively sampled. Included in this study were consenting male and female registered APNs, APN interns, and Master of Nursing students aged 21 years and above. Within the context of this study, the term 'APNs' refers to nurses who have completed all aspects of the formal APN preparatory training. 'APN interns' refers to Master of Nursing graduates in the midst of their 12-month supervised internship under a provisional licence. Finally, 'Master of Nursing students' refers to RNs receiving formal APN education at the university. Participants must have access to a personal computer or mobile device with microphone and camera functions. APNs, APN interns, or Master of Nursing students who refused to have their interviews audio-recorded or their web cameras turned on during the videoconference were excluded.

Electronic invitation letters with information about the study were disseminated via email to all the National University of Singapore Master of Nursing alumni by the programme administrator. In addition, interested alumni were requested to contact the study team via email. The study team would then respond and arrange a mutually convenient time to go through the consent process and conduct the interview. Snowballing sampling was also adopted. The study team also received referrals from the study participants.

2.3 | Data collection

Each consenting participant then took part in a single session, individual, semi-structured interview through videoconferencing (Zoom) between April and August 2021 with one of the authors (B. W., Female, PhD-prepared). During the interviews, web cameras and microphones were set up so that the researcher and participants could see and hear each other (including the participants' non-verbal cues). The researcher had no prior relationships with the participants.

With a flexible interview guide, the researcher explored the participants' perspectives towards males in the APN workforce. Examples of the questions were: 'Why is there an under-representation of males in the APN workforce?' and 'Do you think nursing leaders take into consideration the gender of the RN when nominating him or her for the MN programme?'. The interviews were audio-recorded and transcribed in verbatim, ranging from 48 to 64 min (median = 54 min).

2.4 | Data analysis

Data analysis and data collection took place in parallel and complemented each other. During data analysis, no new information and codes were generated between the 15th and 16th interviews. It was then the study team agreed that data saturation was achieved (Green & Thorogood, 2004). Accordingly, recruitment concluded at the 16th interview. Following this, thematic analysis, guided by Braun and Clarke (2006), was undertaken inductively, with the themes and subthemes being extrapolated from the data rather than from existing conceptual frameworks or theories (Fereday & Muir-Cochrane, 2006).

When generating codes across the data corpus, some techniques from the grounded theory were used (Charmaz, 2014). The techniques included line-by-line coding of the interviews transcribed in verbatim, discussions among study team researchers about emergent codes and deviant cases, and adopting a constant comparative method (Strauss & Corbin, 1990). The researchers read the interview transcripts and listened to the audio-recordings repeatedly to gain familiarity with the data. Next, codes were refined and arranged into potential themes and subthemes using a semantic approach. The themes and subthemes were assessed if they cohere meaningfully with the codes and data corpus. Subsequently, the themes and subthemes were refined and defined (Braun & Clarke, 2006). The constant comparative method was undertaken in coding, developing, reviewing, and defining themes. The relationships between and within each theme were compared (Strauss & Corbin, 1990). Discussions continued until all the researchers (B. W., G. Y. S., and Z. W.) agreed on the final themes and subthemes (Braun & Clarke, 2006).

2.5 | Rigour

To ensure the rigour of our study, criteria for authenticity and trustworthiness were upheld (Guba & Lincoln, 2018). Authenticity was ensured by exercising fairness, demonstrated by assigning equal consideration and weight to every participant's insights (Guba & Lincoln, 2018). Trustworthiness involves credibility, dependability, confirmability, and transferability. Each interview lasted more than 30 min to ensure credibility, allowing prolonged engagement with the participant. Additionally, to enable triangulation, the data analysis was undertaken by three researchers (B. W., G. Y. S., and Z. W.).

Furthermore, member-checking followed the interviews, involving four consenting participants with contrary perspectives: They were first presented with the preliminary themes, subthemes and participants' quotes. Then, they were requested to examine the representativeness of their views (Birt et al., 2016). To ensure dependability and confirmability, the interview transcripts were checked by researchers not involved in transcription. Throughout the data analysis, an audit trail was kept alongside field notes and reflexive annotations to record the researchers' tendencies and intents. Lastly, to permit readers to determine the transferability of this study, the participants' socio-demographic characteristics, verbatim quotes, and relevant contexts were provided for their appraisal.

3 | FINDINGS

3.1 | Demographic profile

Of the 16 participants recruited (eight males and eight females), the majority were Chinese (n = 13) and were married (n = 12). Their ages ranged from 29 to 43 years (median = 36 years), and their nursing experiences ranged from 6 to 20 years (median = 11 years) (Table 1). Six were Master of Nursing students, three were in the midst of their APN internships, and seven were APNs. All but two of them were working with adult patients.

3.2 | Thematic findings

Three themes were generated, each of which was, in turn, supported by three subthemes that further illustrated the participants' perspectives towards the selection and recruitment of males into the APN workforce (Table 2).

3.2.1 | Theme 1: The odds are eventually in the favour of men

The participants shared that there was no gender preference in the selection and recruitment of APNs into the workforce. However, they opined that males might enjoy opportunistic advantages over females in the selection for the APN candidature.

Subtheme: Objectivity in the selection process
In general, there is a stipulated set of objective criteria for selecting nurses for the formal APN preparatory education. According to the participants, any nurse might express their interest in the APN track to their direct reporting officers (usually the nurse managers or nurse clinicians of their wards or clinics). Following this, the managers or clinicians would submit a nomination for the interested nurse. Some participants shared that their institutions made application forms available on the intranet for interested nurses. Others added that potential candidates in their institutions were to be assessed for

TABLE 1 Participant characteristics (n = 16)

Demographics	n
Age (years)	
Median (range)	36 (29–43)
Gender	
Female	8
Male	8
Race	
Chinese	13
Indian	2
Malay	1
Marital status	
Married	12
Single	4
Nursing work experience (years)	
Median (range)	11 (6–20)
APN career stage	
MN student	6
APN intern	3
APN	7
Highest level of education	
Master's degree	10
Bachelor's degree	5
Post-graduate diploma	1
Current job title	
Senior staff nurse	8
Assistant nurse clinician	1
Nurse clinician	3
Senior nurse clinician	3
Assistant director of nursing	1
Work setting	
Adult inpatient	6
Adult acute care (ICU or ED)	4
Paediatrics (inpatient)	2
Mental health (inpatient)	2
Mental health (inpatient, outpatient and community)	1
Adult inpatient and outpatient	1

Abbreviations: MN, Master of Nursing; APN, Advanced Practice Nurse; ICU, intensive care unit; ED, emergency department.

clinical acumen and critical thinking through short assessments known as Multiple Mini Interviews:

> … the selection process is objective because we use the MMI [multiple mini interviews]. So, it is an objective way to assess the clinical ability of a nurse. So, it is a voluntary kind of sign up like whoever is considering to become an APN, they just need to sign up. Basically, everybody has equal chance … *[sic]* (P8, Female, APN)

TABLE 2 Themes and subthemes

Themes	Subthemes	Quotes
The odds are eventually in the favour of men	Objectivity in the selection process	'I do not think nursing leaders will take into account the gender. I think they look more into GPAs, so like they will consider your education background, and you are your contributions to the organisation, and how well have you performed. You have to score A for 3 consecutive years for your work appraisal and your GPA must be 3.2 and above. [sic]' (P16, female, MN student) 'I think it depends more on their academic results, their calibre and suitability for the APN role rather than gender issue [sic].' (P13, male, APN)
	Differing gender-specific role expectations in the family	'That [the need to defer plans to get pregnant] caused one of the potential candidates actually to turn down the offer [to enter the MN programme] … ambiguity to when she can start family planning caused her to withdraw from the programme and prioritise family planning over, umm, the APN programme. [sic]' (P1, male, student) '… when they [women] have to deliver [the baby], of course, they will be unable to carry on with their studies. So, they either have to postpone it, or some of them, if they cannot cope with their family, their kids, I'm not sure whether they need to withdraw from the programme. But this is not part of my considerations. [sic]' (P3, male, student)
	The inevitable 'glass escalator'	'I feel like even though male nurses are the minority, there's certain advantage. So, I've seen male nurses if you [men] are good right, you are recognised more easily than your female counterparts because they [men] are so scarce, right? So, if one stood out, that person have more opportunities compared to his peers who are female, because he just stands out more easily. He's male and he can just outshine … he just managed to, in a way, get the upper hand. [sic]' (P4, female, intern) 'The career progression [of men] is smoother, as long as they do not cause a kerfuffle at work. [sic]' (P1, male, student).
The APN career-track is unpopular among men	Gender-stereotyped attributes influencing career choice	'… stereotype that males have better management style because they are more task-oriented and less emotional in their decision making makes male nurses better nurse managers. [sic]' (P1, male, student) 'I somehow think it is better for males to become managers. Males are less reactive in a lot of circumstance, so always give people the vibe that they are a bit more cool-headed. So, I think that is a good leadership quality … more cool-headed, less reactive. So, I feel that males usually in the female environment they tend to have a better head start. I feel male have a better head start of the management or leadership pathway. [sic]' (P5, female, student)
	Sacrifices in renumeration and career progression	'… by the 4th year, you are just starting to craft your role as an APN … compared to the regular RNs who stay in clinical and continue to provide their service [to the organisation]. Definitely, there will be more opportunities for them [regular RNs] to get promoted compared those who decided to go for the MN programme. [sic]' (P9, female, APN) 'After you graduate as an APN, your increment around 400 to 450, right? But you spend almost three years to struggle with this [MN] program. But if they [RNs] stay in the clinical area, if they promote as an NC [nurse clinician] or ANC [assistant nurse clinician], they can get seven hundred dollars … one of my NC currently in my ward, he does not want to go to be an APN. He went to study a masters of management in one of those private universities. He thinks, 'why do I need to struggle? My pay going to increase more than your salary.' [sic]' (P14, male, intern)
	Gender-based stigmatisation of nursing	'I have brothers. If I were to ask my brothers to consider nursing as a profession, they would say, 'oh, it's a girl's job.' So I mean, as much as I do not want people to think that way, but I cannot, you know? It's something is in-built in them that nursing is very feminine, cannot have men in doing the job. Then any men who is in nursing are thought to be feminine and not masculine. [sic]'(P15, female, intern) '… in Asian countries, maybe China and Taiwan, I think there is still this mindset that being a nurse is still a female-dominated work. [sic]' (P3, male, student)
Balancing the gender gap in the APN workforce	Male APNs are a 'good-to-have' and not a 'must-have'	'There is not really anything different what male and female APNs are doing. That is quite awesome. [sic]' (P12, male, APN) 'I think there are some ways where guys think a little bit differently from females … I think we appreciate the way how different people think … a team cannot be of the same character or same personality or the same way of thinking because you will not have change, you will improve. [sic]' (P7, female, APN)

(Continues)

TABLE 2 (Continued)

Themes	Subthemes	Quotes
	Good role models and better articulation of the role	'… seeing how our APN seniors work is an inspiration to us. We see how they are equipped with masters and being APN, they do more for our patients. They have little bit more autonomy at work. APNs can make certain decisions without needing to ask permissions from doctors … more autonomy in terms of providing care. [sic]' (P13, male, APN) 'There are still a lot of questions revolving around what is the service that they [APNs] provide … they have to differentiate themselves from the nurse clinicians … it requires quite a lot of pioneering kind of work to tell your colleagues what your role as an APN is and what you are working for. [sic]' (P7, female, APN)
	'De-gendering' the gendered stigmatisation of nursing	'[having more men] dispels the social stigma of nursing being an effeminate job. [sic]' (P5, female, student) '… we do need a male representative to show that our job, there is nothing soft about it. There's nothing feminine about it. It's actually very tough. So having a guy in the APN profession or to represent nursing or to represent APN can actually show people, 'oh nursing is not an easy job. It's can be a masculine job.' It actually takes lots of guts and lots of IQ [intelligence quotient] and EQ [emotional quotient]. [sic] (P15FI)

Additionally, the participants remarked upon the need for interviews with their nursing leaders and Human Resource personnel. During these interviews, candidates would be evaluated for not only their understanding of and interest in the APN role but also their suitability for it. The need for APN-led services in a given specialty was usually examined as well:

> … although you are may be interested in a certain area but that area of expertise may not require an APN … they [nursing leaders] said, 'These are the few disciplines that we are currently accepting APNs. Do you feel you are interested in any of these?' [sic] (P2, Male, student)

In sum, the selection and assessment of the candidates by the nursing leaders and administrators were reported by the participants to be independent of the candidates' gender.

Subtheme: Differing gender-specific role expectations in the family

According to the participants, during the selection interviews, the candidates were frequently asked questions related to their families and the need for help at home while they embarked on the APN preparatory training:

> … am I married, single? Do I have children? Who is looking after the children? Am I or will I be occupied with family? [sic] (P6, Male, Student)

> they were very concerned [that I have a toddler]. One of the interview questions I got asked, I think twice, was whether or not I am able to cope with being a mother and a full-time student. That's the question they [nursing leaders] asked during the interview. [sic] (P15, Female, Intern)

Given its intensive nature, the APN preparatory training was known to demand full commitment from the candidates and might even require time away from their families. Hence, family support was deemed an important contributor to the successful completion of the programme. In this regard, married female candidates were strongly encouraged to delay plans of pregnancy because it might disrupt the training. Additionally, the prospect of making adjustments to family life was opined to deter females from pursuing the APN career track because of their role in their family: they were thought to be more 'family-orientated' and less 'career-focused' than males (P13, Male, APN). Moreover, 'societal pressure [persisted] for men to be the main breadwinner' (P4, Female, Intern) and for women to bear the responsibility of childbearing.

Subtheme: The inevitable 'glass escalator'

Because nursing was a female-dominated profession, males who joined nursing would tend to stand out and be more prominent than females, as shared by the participants:

> … they [men] also understand that they are more outstanding as males you know, so for example, just within a ward, there's probably going to be only two or three males … Whatever they do is being magnified, if they have a compliment, wow, everybody knows right? [sic] (P5, Female, Student)

Against such a background, the participants observed that males appeared to be recognized and appreciated more often than females for any given work of similar quality. Furthermore, the participants added that males' opinions appeared to carry more weight than females' in their work environments. Moreover, being the minority in the nursing workforce caused them to receive unintended advantages over females in career advancement. Such observations led to the participants' view that male nurses were on a 'glass escalator' and

enjoyed accelerated career progression; thus, they were more likely to be identified as potential candidates for the APN career.

3.2.2 | Theme 2: The APN career-track is unpopular among men

Interestingly, though the odds were seemingly in their favour, male nurses were noted to lack interest in becoming APNs. Several factors might have made the APN career less appealing, especially to males.

Subtheme: Gender-stereotyped attributes influencing career choice
Males were generalized to be decisive, analytical, authoritative, and composed, based on which they were thought to be good candidates for leadership roles. Conversely, females were described as nurturing, detail-oriented, and emotionally-driven:

> … we have some men who are natural leaders, born to be leaders-type *[sic]* (P7, Female, APN)

> [institutional leaders] choose men for very big positions like managerial roles … maybe we are females, we are more emotional, I'm a female myself. I can be emotional but males they can control their emotions very well. *[sic]* (P16, Female, Student).

Given such perceived personality traits, the participants opined that males in nursing tended to gravitate towards more managerial and leadership-related career tracks and away from more clinical and education tracks within their organizations. Conversely, the minority of males who did join the APN workforce were usually motivated by their strong interest in clinical work and opportunities to develop further in clinical knowledge and skills. They also saw the APN career track as an opportunity to exercise clinical leadership.

Subtheme: Sacrifices in remuneration and career
As aforementioned, all APN candidates would require nomination and funding from their institutions. Although still technically employed by their institutions during the Master of Nursing programme and internship (which spanned about 3 years), most APN candidates experienced minimal salary increments and would not be considered for any promotions:

> … the problem is during our [Master of Nursing] studies, we do not get promoted. Whereas your peers that join [the nursing workforce] the same time as you gets promoted. I think that's a very big deterrent for most nurses, not just males, both males, and females. We do hear a lot of unhappiness about it. *[sic]* (P10, Female, APN)

Apart from these possible impacts on remuneration and promotion, uncertain career prospects and academic stringency further deterred nurses from becoming APNs. Nurses were concerned with the lack of clear career pathways for APNs, especially compared with the four more structured, conventional career pathways in nursing (clinical, management, education, and research). They might feel more inclined to choose a more structured pathway for which there were established performance indicators. Moreover, educational requirements for the other tracks were more flexible: in some institutions, it was not mandatory for nurse managers, nurse clinicians, nurse educators, or nurse researchers to be Masters-holders. In sum, although these considerations would be common to both genders, males appeared to be more affected by this, because of expectations on them to provide for their families:

> … for guys, opportunity costs and salary are very important. They must support the family. *[sic]* (P5, Female, Student)

Subtheme: Gender-based stigmatization of nursing
The participants shared that, given the widespread perception of nursing as an effeminate job, males in the profession were often described with attributes carrying unpleasant connotations:

> "It doesn't have that prestige. You tell your relative 'I'm a nurse', they say 'huh? You're a male, why are you a nurse, are you a sissy?'. Quite sadly, people also do not see nursing as a profession. *[sic]* (P12, Male, APN)

Coupled with the public's negative perceptions, such gender-based stigmatization of nursing led to low morale among male nurses, who were apprehensive about their career longevity in nursing, as shared by the participants. Consequently, they did not feel the need to develop further in their nursing career, such as the pursuit of the APN career track. Some even eventually left nursing for another profession:

> … some of the guys went to medical school, and some of them went to do property [real estate agents]. Some of them went to become insurance agents. Most of my [male] friends, they venture into business. *[sic]* (P12, Male, APN).

3.2.3 | Theme 3: Balancing the gender gap in the APN workforce

The participants did not find males' lack of interest in the APN career track concerning. Nonetheless, they did see value in disrupting the status quo of their low numbers in the APN workforce.

Subtheme: Male APNs are 'good-to-have' and not a 'must-have'
The scarcity of males in the APN workforce was not perceived to be unsettling. During the discussion on recruiting males into the

APN workforce, one participant commented that having more male APNs 'is not a must-have but more of a good-to-have' (P10, Female, APN). Such a view was shared by most other participants because the gender of the APN hardly influenced the scope and outcomes of practice:

> I feel it [gender of the APN] doesn't really matter. Because what we [APNs] do, our scope of practice, is the same for both male and female APNs. [sic] (P11, Male, APN).

Instead, there was a general need to recruit more committed and passionate APNs, both males and females:

> ... we need more APNs rather than need more male APN. [sic] (P13, Male, APN)

> it really depends on whether they have that, in Chinese we call it, 心和力 [passion and commitment] you know? Like they have that commitment and that passion to take on the role of the APN ... doesn't need to be male or female ... [sic] (P7, Female, APN)

Nevertheless, there was consensus among the participants that it would be healthy to have gender diversity within the APN workforce. With males and females perceived to have gender-specific traits and strengths, gender diversity within the workforce could promote better exchange of ideas:

> ... regardless of profession, it's always good to have a gender balance because different genders bring different characteristics. [sic] (P4, Female, Intern)

Subtheme: Good role models and better articulation of the role

To address the gender disparity in the APN workforce, the recruitment of males should be improved. Many participants cited the lack of role clarity as a deterrent for males to pursue the APN career track. It followed that exemplary APN role models would inspire early-career nurses to become APNs themselves:

> They'll [early career nurses] be like 'oh, what a good role model. I look forward to becoming like that!' ... we have a male APN in our institution, everybody looks up to him because of the knowledge that he has to offer ... the amount he has to teach. But I think his gender plays a part as well. Having a male APN does impact the number of people who wants to join the APN course. [sic] (P16, Female, Student]

To improve role clarity of APNs, the participants advocated the need to more accurately publicise and 'rebrand' it as a 'knowledge-intensive occupation':

> APNs should be advertised in Singapore as nurses who have the knowledge and skills that go beyond making people feel better. APNs have the clinical expertise and it is a knowledge-intensive occupation. I think this can attract more men into the nursing profession ... it's not just about us being caring, it is a knowledge-intensive occupation. [sic] (P4, Female, Intern)

Subtheme: 'De-gendering' the stigmatization of nursing

Through better gender diversity within the APN workforce, the participants believed that the stigma of nursing being an effeminate job would be reduced and that nursing would be viewed as an inclusive profession with diverse demographics:

> ... it tells people we are more open to having different types of people perform what used to be a very feminine role within the healthcare system. [sic] (P10, Female, APN)

With greater inclusivity in the APN workforce, patients, the public, and even healthcare colleagues would notice that males were developing professionally and thriving in nursing. This might contribute to reducing the gender-based stigmatization of nursing.

> If they have more male representation in the APN workforce, when patients visit the hospital, they see men doing a wonderful job in the hospital and are impressed by their care received during their hospital stay. Subsequently, the patient will change their perspectives about nursing. [sic] (P6, Male, Student)

4 | DISCUSSION

At present, this qualitative inquiry is the first of its kind in Asia to explore the gender disparity and recruitment of males in the APN workforce from the perspectives of males and females pursuing or in the midst of their APN careers. This study shares important insights into addressing the gender gap in the APN workforce.

Much of the existing literature drew attention to the discrimination men experience, in the form of gender role conflicts and stereotypes, throughout their nursing career (Brody et al., 2017; Younas et al., 2019). Interestingly, in this study, although gender-based stigmatization of nursing is ascertained as a longstanding issue in Singapore, men in nursing did not seem to experience discrimination with regard to professional development. Instead, males in nursing appear to be beneficiaries of opportunistic advantages in professional development. Despite the objectivity in the selection of APN candidates, males are more likely to be identified as potential candidates for APN training than their female counterparts. This can be attributed to the dominant role of females in childbearing and caregiving (Holahan, 1994) and is true even among highly intelligent females with

successful careers. A systematic review (Schlegler, 2022) on the professional state of gifted adults has reported that females would experience significant changes in their careers after the age of 35 years. Females were observed either to transit from being gainfully employed before starting a family to becoming homemakers or to remain gainfully employed without much career aspiration. Moreover, gifted females have also been reported to be more likely than gifted males to face trade-off decisions where they had to choose between their career or family: ultimately, they would gravitate towards a career that made allowances for their family planning (Schlegler, 2022). Such literature validates the findings in this study, considering that most RNs start their APN preparatory training in their 30s (Woo et al., 2020).

The term 'glass escalator' first introduced by Williams (1992), describes the underlying advantage men enjoy in female-dominated professions that facilitates their career progression. The phenomenon of such a 'glass escalator' has been underscored in this study. According to a few earlier studies, men may feel different or out of place among their female nursing colleagues but often do not feel discriminated against (Smith et al., 2020; Zeb et al., 2020). Conversely, as the minority in nursing, males have been reported by the participants to be more prominent than their females, and their positive work performances are more likely to be noticed. Such findings are echoed in Asian (Zhang & Tu, 2020) and Western (Smith et al., 2020) nursing populations. Moreover, across cultures, males in nursing have been observed to receive greater recognition from their managers than females. These observations therefore, lead to their favourable positions for career advancements (Smith et al., 2020; Younas et al., 2022; Zhang & Tu, 2020).

To address the 'glass escalator' phenomenon, an obvious implication for the management of staff would be to slow it down strategically (Brandford & Brandford-Stevenson, 2021). However, this is superfluous in the context of APN recruitment of males in Singapore. Elucidated in this study is males' disinterest in the APN role, as explained by the achievement-orientated traits of males such as decisiveness, aggressiveness, independence, and firmness (Heilman, 2001), which are found among males in nursing too. This, therefore, causes them to prefer managerial positions, for which the career progression is more certain, in their organizations.

Ironically, despite the apparent opportunistic advantages of males in nursing, the impact of gender-based stigmatization of nursing remains evident. This longstanding stigmatization makes it challenging for males to adapt to the female-dominated nursing culture, which compromises their delivery of patient care and ultimately reduces their job satisfaction (Finnegan, 2019; Younas et al., 2022). Such negative implications deter males from staying in the profession long enough to become APNs. Therefore, as demonstrated by our findings, addressing the gender gap within the APN workforce fosters a healthier and more inclusive working environment.

As elucidated in this study, experiences for males in nursing are complex, spanning from the privilege of being on the 'glass escalator' to the stigmatization for being in nursing. Although this is so, recruiting more males into the APN workforce may address the general shortfall in the profession. Addressing this shortfall may inevitably improve nurses' working conditions (Clifton et al., 2020).

Lastly, within the context of this study, nurses have expressed apprehension on becoming APNs because of the lack of role clarity (Woo et al., 2019, 2020). Hence, a delineation of the APN role may facilitate the recruitment of APNs. More specifically, to reduce the stigmatization and encourage gender diversity in the workforce, it may be propitious to have positive male role models mentor nurses (Armitage, 2013). This has also been demonstrated in this study. Intentional mentoring of male nurses through a 'buddy' system and informal meetings may be good avenues for men to share experiences, which can help reduce feelings of isolation and exclusion. Additionally, nursing leaders and administrators should be more proactive in creating a positive and inclusive environment where male nurses are supported and accepted by patients and peers and improve their visibility (Younas et al., 2022). Such strategies are envisioned to retain males sufficiently long in nursing to pursue the APN career.

4.1 | Limitations

One limitation of this study was the purposive sampling of the participants, which was distinctive of qualitative inquiry. Though they were in various APN career stages, the participants were all recruited from Singapore, which may limit the generalizability of the findings to other countries. Nonetheless, the aim of this study was not to generalize but to promote the transferability of knowledge from one context to another. Our findings provide pioneering insights that can be transferred to other contexts in similar stages of APN development.

5 | CONCLUSIONS

Although males in nursing enjoy opportunistic advantages in entering the APN workforce, they are not interested in the role and not staying long enough in the nursing profession to become APNs. This paper offers insights into the poor recruitment of males in the APN workforce and suggestions to combat that. Further inquiry is required to understand how regulatory bodies and nursing institutions may promote a more inclusive environment that reduce gender stigmatization.

5.1 | Implications for nursing management

Nurse managers should be more cognizant of the different social stereotypes faced by males and females in nursing. With such awareness, they can be more supportive and less biased in career counselling and job appraisals. In light of the need to improve APN recruitment, institutional leaders and policy makers need to be more proactive in recruiting RNs into the APN preparatory training. Greater flexibility in the completion of the training for female candidates with children may be advantageous to increasing interest in the APN career. Positive role modelling and clear articulation of the APN role may also

improve the recruitment of both male and female candidates into the APN workforce.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

ETHICS STATEMENT

All research activities of the study were approved by the Institutional Review Board of the National University of Singapore (NUS-IRB-2021-71).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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ORIGINAL ARTICLE

WILEY

Understanding the gender gap in advanced practice nursing: A qualitative study

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Abstract

Aims: We aim to explore the perceptions of registered nurses undergoing the advanced practice nurse preparatory programme and of advanced practice nurses towards the recruitment of men into the advanced practice nursing workforce.

Background: Given the need to expand and diversify the advanced practice nursing workforce, it is important to recognize the potential implications of gender disparity. It is critical to understand why few males are recruited into the advanced practice nursing preparatory programme and to determine whether gender-related bias is present in the professional development of nurses.

Method: We use a descriptive qualitative design. Semi-structured interviews were conducted via Zoom (April to August 2021).

Results: Three themes were generated: 'The odds are eventually in the favour of men', 'The APN career-track is unpopular among men', and 'Balancing the gender gap in the APN workforce'. All themes are supported by three subthemes.

Conclusions: Although males in nursing enjoy opportunistic advantages in entering the advanced practice nursing workforce, they are not interested in the role and not staying long enough in the nursing profession to become advanced practice nurses.

Implications for Nursing Management: Nurse managers should be more cognizant of the different social stereotypes faced by males and females in nursing. With such awareness, they can be more supportive and less biased in career counselling and job appraisals.

KEYWORDS
nurse practitioners, nursing image, recruitment, workforce

1 | INTRODUCTION

Gender disparity has long been noted in nursing, a predominantly female-dominated profession (Barrett-Landau & Henle, 2014). Across the world, males comprise only 11% of the nursing workforce (World Health Organization, 2020). This is unsettling because an accurate representation of the general population's demographic composition is integral to any profession. Furthermore, such disparity is of concern especially in view of the global shortage of nursing staff: The World Health Organization (2021) has forecast

a global shortfall of 9 million nurses to meet population health needs by 2030.

In Singapore, gender disparity has persisted. Although the number of male nurses has risen with time, the pace is not encouraging: their proportion among registered nurses (RNs) has only increased from 8.2% in 2008 to 11.6% in 2020 (Singapore Nursing Board, 2021). The phenomenon is also true among Singapore's advanced practice nurses (APNs), who are nursing leaders spearheading patient care with demonstrable clinical contributions (Laurant et al., 2018; Smits et al., 2020; Woo et al., 2017). The proportion of males among APNs remains disproportionately low: they currently account for less than 5% of the APN workforce (Singapore Nursing Board, 2021).

1.1 | Men in nursing

Nursing being a female-dominated profession has precipitated men in nursing to experience gender role conflicts, stereotypes, and challenges in educational and clinical settings (Younas et al., 2019; Zeb et al., 2020). Men in nursing started encountering such negative experiences while they were students. One common assumption held by many is that men who end up pursuing nursing are only doing so because they are not bright enough to become doctors (Brody et al., 2017). Often, they are also questioned about their sexual orientation (Brody et al., 2017). As a result, male nursing students reportedly have concerns and uncertainties about becoming a nurse. They fear poor acceptance of male nurses among healthcare colleagues and patients would negatively impact their career prospects (Younas et al., 2019; Zeb et al., 2020).

Stereotypes about masculinity have influenced nursing care assignments in clinical practice. Men in nursing are expected to work in fast-paced clinical environments, such as intensive care units or emergency departments, where there is more heavy lifting (Cheng et al., 2018). Men are also thought to be better suited for psychiatry settings where their physical strength would be helpful in managing patients who are at risk to themselves and others (Jordal & Heggen, 2015). In some contexts, men are outrightly precluded from caring for female patients (Zeb et al., 2020). These role expectations can marginalize and cause a strain among men in nursing (Smith et al., 2020).

To avoid gender role conflicts and discrimination, some men become nurse educators. Although these men received more respect and appreciation as educators, they still feel compelled to constantly prove their worth and improve themselves. These feelings stemmed from prejudices engrained in the nursing culture against male nurses (Zeb et al., 2020). Over time, these issues men face in nursing could culminate and result in feelings of isolation, stress, and burnout (Carnevale & Priode, 2018). These could negatively impact retaining men in nursing (Rajacich et al., 2013).

1.2 | Recruitment of APNs in Singapore

In Singapore, APNs are Masters-prepared nurses with a professional licence to practice beyond an RN's fundamental scope of practice. The role of an APN in the context of Singapore represents a hybrid between that of a nurse practitioner and a clinical nurse specialist (Woo et al., 2019). Additionally, some APNs have collaborative prescribing authority (Ministry of Health, 2018).

Currently, the Singapore Nursing Board oversees the APN practice and licensure, the prerequisite for which is a formal preparatory training. This comprises an 18-month Master of Nursing programme at the National University of Singapore and a 12-month supervised internship under a provisional licence (Singapore Nursing Board, 2020). Upstream enrolment of RNs into the Master of Nursing programme requires endorsement and recommendation from their nursing leaders (besides minimum academic requirements and clinical experiences) (National University of Singapore, n.d.). An aspect unique to Singapore is that such matriculated RNs will enter an employment bond with their healthcare institutions, under which they are thus expected to develop their careers as APNs. Accordingly, nursing leaders are crucially involved in selecting RNs for APN practice (Woo et al., 2020).

A robust nursing workforce is critical to attaining universal health. Thus, there has been an ongoing interest to recruit more APNs to strengthen the APN workforce, as demonstrated by the aim of Singapore's Ministry of Health to double the number of APNs by 2030 (Begum, 2021). Accordingly, expanding the APN workforce entails addressing the gender disparity, especially given the evolving healthcare and sociocultural landscape (Thompson et al., 2020). Moreover, diversifying the APN workforce translates into the practical utility of tapping into the male population for their expertise. This builds a more gender-inclusive environment for males and ultimately improves patient care and experiences (Smith et al., 2020).

Given the need to expand and diversify the APN workforce, it is important to recognize the potential implications of gender disparity. Therefore, it is critical not only to understand why few males are recruited into the APN preparatory programme but also to determine whether gender-related bias is present in the professional development of RNs. Furthermore, it may be propitious to understand if men are staying long enough in nursing to become APNs. Such findings are envisioned to provide practical insights into potential solutions to address gender disparity.

1.3 | Aims

Accordingly, this inquiry aimed to explore the perceptions of RNs undergoing the APN preparatory programme and of APNs towards:

i. the shortage of men in the APN workforce;
ii. the selection and recruitment of men into the APN preparatory programme; and

iii. the influence of having more men in the APN workforce on the professional image of nursing in Singapore.

2 | METHODS

2.1 | Study design

A descriptive qualitative design (Polit & Beck, 2012) was adopted. Participant recruitment, data collection, and data analysis were iteratively performed to explore diversity from the nurses' perspectives. Additionally, this study adhered to the 32-item Consolidated criteria for Reporting Qualitative research (Tong et al., 2007) (Appendix S1).

2.2 | Setting and sample

Singapore, a city-state with a total population of 5.45 million people and a population density of 7485 people per square kilometre, was the study setting (Singapore Department of Statistics, 2022). There are 35,948 RNs (32,621 in active practice) and 330 APNs (327 in active practice) in Singapore (Singapore Department of Statistics, 2022).

The participants were purposively sampled. Included in this study were consenting male and female registered APNs, APN interns, and Master of Nursing students aged 21 years and above. Within the context of this study, the term 'APNs' refers to nurses who have completed all aspects of the formal APN preparatory training. 'APN interns' refers to Master of Nursing graduates in the midst of their 12-month supervised internship under a provisional licence. Finally, 'Master of Nursing students' refers to RNs receiving formal APN education at the university. Participants must have access to a personal computer or mobile device with microphone and camera functions. APNs, APN interns, or Master of Nursing students who refused to have their interviews audio-recorded or their web cameras turned on during the videoconference were excluded.

Electronic invitation letters with information about the study were disseminated via email to all the National University of Singapore Master of Nursing alumni by the programme administrator. In addition, interested alumni were requested to contact the study team via email. The study team would then respond and arrange a mutually convenient time to go through the consent process and conduct the interview. Snowballing sampling was also adopted. The study team also received referrals from the study participants.

2.3 | Data collection

Each consenting participant then took part in a single session, individual, semi-structured interview through videoconferencing (Zoom) between April and August 2021 with one of the authors (B. W., Female, PhD-prepared). During the interviews, web cameras and microphones were set up so that the researcher and participants could see and hear each other (including the participants' non-verbal cues). The researcher had no prior relationships with the participants.

With a flexible interview guide, the researcher explored the participants' perspectives towards males in the APN workforce. Examples of the questions were: 'Why is there an under-representation of males in the APN workforce?' and 'Do you think nursing leaders take into consideration the gender of the RN when nominating him or her for the MN programme?'. The interviews were audio-recorded and transcribed in verbatim, ranging from 48 to 64 min (median = 54 min).

2.4 | Data analysis

Data analysis and data collection took place in parallel and complemented each other. During data analysis, no new information and codes were generated between the 15th and 16th interviews. It was then the study team agreed that data saturation was achieved (Green & Thorogood, 2004). Accordingly, recruitment concluded at the 16th interview. Following this, thematic analysis, guided by Braun and Clarke (2006), was undertaken inductively, with the themes and subthemes being extrapolated from the data rather than from existing conceptual frameworks or theories (Fereday & Muir-Cochrane, 2006).

When generating codes across the data corpus, some techniques from the grounded theory were used (Charmaz, 2014). The techniques included line-by-line coding of the interviews transcribed in verbatim, discussions among study team researchers about emergent codes and deviant cases, and adopting a constant comparative method (Strauss & Corbin, 1990). The researchers read the interview transcripts and listened to the audio-recordings repeatedly to gain familiarity with the data. Next, codes were refined and arranged into potential themes and subthemes using a semantic approach. The themes and subthemes were assessed if they cohere meaningfully with the codes and data corpus. Subsequently, the themes and subthemes were refined and defined (Braun & Clarke, 2006). The constant comparative method was undertaken in coding, developing, reviewing, and defining themes. The relationships between and within each theme were compared (Strauss & Corbin, 1990). Discussions continued until all the researchers (B. W., G. Y. S., and Z. W.) agreed on the final themes and subthemes (Braun & Clarke, 2006).

2.5 | Rigour

To ensure the rigour of our study, criteria for authenticity and trustworthiness were upheld (Guba & Lincoln, 2018). Authenticity was ensured by exercising fairness, demonstrated by assigning equal consideration and weight to every participant's insights (Guba & Lincoln, 2018). Trustworthiness involves credibility, dependability, confirmability, and transferability. Each interview lasted more than 30 min to ensure credibility, allowing prolonged engagement with the participant. Additionally, to enable triangulation, the data analysis was undertaken by three researchers (B. W., G. Y. S., and Z. W.).

Furthermore, member-checking followed the interviews, involving four consenting participants with contrary perspectives: They were first presented with the preliminary themes, subthemes and participants' quotes. Then, they were requested to examine the representativeness of their views (Birt et al., 2016). To ensure dependability and confirmability, the interview transcripts were checked by researchers not involved in transcription. Throughout the data analysis, an audit trail was kept alongside field notes and reflexive annotations to record the researchers' tendencies and intents. Lastly, to permit readers to determine the transferability of this study, the participants' socio-demographic characteristics, verbatim quotes, and relevant contexts were provided for their appraisal.

3 | FINDINGS

3.1 | Demographic profile

Of the 16 participants recruited (eight males and eight females), the majority were Chinese ($n = 13$) and were married ($n = 12$). Their ages ranged from 29 to 43 years (median = 36 years), and their nursing experiences ranged from 6 to 20 years (median = 11 years) (Table 1). Six were Master of Nursing students, three were in the midst of their APN internships, and seven were APNs. All but two of them were working with adult patients.

3.2 | Thematic findings

Three themes were generated, each of which was, in turn, supported by three subthemes that further illustrated the participants' perspectives towards the selection and recruitment of males into the APN workforce (Table 2).

3.2.1 | Theme 1: The odds are eventually in the favour of men

The participants shared that there was no gender preference in the selection and recruitment of APNs into the workforce. However, they opined that males might enjoy opportunistic advantages over females in the selection for the APN candidature.

Subtheme: Objectivity in the selection process
In general, there is a stipulated set of objective criteria for selecting nurses for the formal APN preparatory education. According to the participants, any nurse might express their interest in the APN track to their direct reporting officers (usually the nurse managers or nurse clinicians of their wards or clinics). Following this, the managers or clinicians would submit a nomination for the interested nurse. Some participants shared that their institutions made application forms available on the intranet for interested nurses. Others added that potential candidates in their institutions were to be assessed for

TABLE 1 Participant characteristics ($n = 16$)

Demographics	n
Age (years)	
Median (range)	36 (29–43)
Gender	
Female	8
Male	8
Race	
Chinese	13
Indian	2
Malay	1
Marital status	
Married	12
Single	4
Nursing work experience (years)	
Median (range)	11 (6–20)
APN career stage	
MN student	6
APN intern	3
APN	7
Highest level of education	
Master's degree	10
Bachelor's degree	5
Post-graduate diploma	1
Current job title	
Senior staff nurse	8
Assistant nurse clinician	1
Nurse clinician	3
Senior nurse clinician	3
Assistant director of nursing	1
Work setting	
Adult inpatient	6
Adult acute care (ICU or ED)	4
Paediatrics (inpatient)	2
Mental health (inpatient)	2
Mental health (inpatient, outpatient and community)	1
Adult inpatient and outpatient	1

Abbreviations: MN, Master of Nursing; APN, Advanced Practice Nurse; ICU, intensive care unit; ED, emergency department.

clinical acumen and critical thinking through short assessments known as Multiple Mini Interviews:

> ... the selection process is objective because we use the MMI [multiple mini interviews]. So, it is an objective way to assess the clinical ability of a nurse. So, it is a voluntary kind of sign up like whoever is considering to become an APN, they just need to sign up. Basically, everybody has equal chance ... *[sic]* (P8, Female, APN)

TABLE 2 Themes and subthemes

Themes	Subthemes	Quotes
The odds are eventually in the favour of men	Objectivity in the selection process	'I do not think nursing leaders will take into account the gender. I think they look more into GPAs, so like they will consider your education background, and you are your contributions to the organisation, and how well have you performed. You have to score A for 3 consecutive years for your work appraisal and your GPA must be 3.2 and above. [sic]' (P16, female, MN student) 'I think it depends more on their academic results, their calibre and suitability for the APN role rather than gender issue [sic].' (P13, male, APN)
	Differing gender-specific role expectations in the family	'That [the need to defer plans to get pregnant] caused one of the potential candidates actually to turn down the offer [to enter the MN programme] … ambiguity to when she can start family planning caused her to withdraw from the programme and prioritise family planning over, umm, the APN programme. [sic]' (P1, male, student) '… when they [women] have to deliver [the baby], of course, they will be unable to carry on with their studies. So, they either have to postpone it, or some of them, if they cannot cope with their family, their kids, I'm not sure whether they need to withdraw from the programme. But this is not part of my considerations. [sic]' (P3, male, student)
	The inevitable 'glass escalator'	'I feel like even though male nurses are the minority, there's certain advantage. So, I've seen male nurses if you [men] are good right, you are recognised more easily than your female counterparts because they [men] are so scarce, right? So, if one stood out, that person have more opportunities compared to his peers who are female, because he just stands out more easily. He's male and he can just outshine … he just managed to, in a way, get the upper hand. [sic]' (P4, female, intern) 'The career progression [of men] is smoother, as long as they do not cause a kerfuffle at work. [sic]' (P1, male, student).
The APN career-track is unpopular among men	Gender-stereotyped attributes influencing career choice	'… stereotype that males have better management style because they are more task-oriented and less emotional in their decision making makes male nurses better nurse managers. [sic]' (P1, male, student) 'I somehow think it is better for males to become managers. Males are less reactive in a lot of circumstance, so always give people the vibe that they are a bit more cool-headed. So, I think that is a good leadership quality … more cool-headed, less reactive. So, I feel that males usually in the female environment they tend to have a better head start. I feel male have a better head start of the management or leadership pathway. [sic]' (P5, female, student)
	Sacrifices in renumeration and career progression	'… by the 4th year, you are just starting to craft your role as an APN … compared to the regular RNs who stay in clinical and continue to provide their service [to the organisation]. Definitely, there will be more opportunities for them [regular RNs] to get promoted compared those who decided to go for the MN programme. [sic]' (P9, female, APN) 'After you graduate as an APN, your increment around 400 to 450, right? But you spend almost three years to struggle with this [MN] program. But if they [RNs] stay in the clinical area, if they promote as an NC [nurse clinician] or ANC [assistant nurse clinician], they can get seven hundred dollars … one of my NC currently in my ward, he does not want to go to be an APN. He went to study a masters of management in one of those private universities. He thinks, 'why do I need to struggle? My pay going to increase more than your salary.' [sic]' (P14, male, intern)
	Gender-based stigmatisation of nursing	'I have brothers. If I were to ask my brothers to consider nursing as a profession, they would say, 'oh, it's a girl's job.' So I mean, as much as I do not want people to think that way, but I cannot, you know? It's something is in-built in them that nursing is very feminine, cannot have men in doing the job. Then any men who is in nursing are thought to be feminine and not masculine. [sic]'(P15, female, intern) '… in Asian countries, maybe China and Taiwan, I think there is still this mindset that being a nurse is still a female-dominated work. [sic]' (P3, male, student)
Balancing the gender gap in the APN workforce	Male APNs are a 'good-to-have' and not a 'must-have'	'There is not really anything different what male and female APNs are doing. That is quite awesome. [sic]' (P12, male, APN) 'I think there are some ways where guys think a little bit differently from females … I think we appreciate the way how different people think … a team cannot be of the same character or same personality or the same way of thinking because you will not have change, you will improve. [sic]' (P7, female, APN)

(Continues)

TABLE 2 (Continued)

Themes	Subthemes	Quotes
	Good role models and better articulation of the role	'... seeing how our APN seniors work is an inspiration to us. We see how they are equipped with masters and being APN, they do more for our patients. They have little bit more autonomy at work. APNs can make certain decisions without needing to ask permissions from doctors ... more autonomy in terms of providing care. [sic]' (P13, male, APN) 'There are still a lot of questions revolving around what is the service that they [APNs] provide ... they have to differentiate themselves from the nurse clinicians ... it requires quite a lot of pioneering kind of work to tell your colleagues what your role as an APN is and what you are working for. [sic]' (P7, female, APN)
	'De-gendering' the gendered stigmatisation of nursing	'[having more men] dispels the social stigma of nursing being an effeminate job. [sic]' (P5, female, student) '... we do need a male representative to show that our job, there is nothing soft about it. There's nothing feminine about it. It's actually very tough. So having a guy in the APN profession or to represent nursing or to represent APN can actually show people, 'oh nursing is not an easy job. It's can be a masculine job.' It actually takes lots of guts and lots of IQ [intelligence quotient] and EQ [emotional quotient]. [sic] (P15FI)

Additionally, the participants remarked upon the need for interviews with their nursing leaders and Human Resource personnel. During these interviews, candidates would be evaluated for not only their understanding of and interest in the APN role but also their suitability for it. The need for APN-led services in a given specialty was usually examined as well:

> ... although you are may be interested in a certain area but that area of expertise may not require an APN ... they [nursing leaders] said, 'These are the few disciplines that we are currently accepting APNs. Do you feel you are interested in any of these?' [sic] (P2, Male, student)

In sum, the selection and assessment of the candidates by the nursing leaders and administrators were reported by the participants to be independent of the candidates' gender.

Subtheme: Differing gender-specific role expectations in the family
According to the participants, during the selection interviews, the candidates were frequently asked questions related to their families and the need for help at home while they embarked on the APN preparatory training:

> ... am I married, single? Do I have children? Who is looking after the children? Am I or will I be occupied with family? [sic] (P6, Male, Student)

> they were very concerned [that I have a toddler]. One of the interview questions I got asked, I think twice, was whether or not I am able to cope with being a mother and a full-time student. That's the question they [nursing leaders] asked during the interview. [sic] (P15, Female, Intern)

Given its intensive nature, the APN preparatory training was known to demand full commitment from the candidates and might even require time away from their families. Hence, family support was deemed an important contributor to the successful completion of the programme. In this regard, married female candidates were strongly encouraged to delay plans of pregnancy because it might disrupt the training. Additionally, the prospect of making adjustments to family life was opined to deter females from pursuing the APN career track because of their role in their family: they were thought to be more 'family-orientated' and less 'career-focused' than males (P13, Male, APN). Moreover, 'societal pressure [persisted] for men to be the main breadwinner' (P4, Female, Intern) and for women to bear the responsibility of childbearing.

Subtheme: The inevitable 'glass escalator'
Because nursing was a female-dominated profession, males who joined nursing would tend to stand out and be more prominent than females, as shared by the participants:

> ... they [men] also understand that they are more outstanding as males you know, so for example, just within a ward, there's probably going to be only two or three males ... Whatever they do is being magnified, if they have a compliment, wow, everybody knows right? [sic] (P5, Female, Student)

Against such a background, the participants observed that males appeared to be recognized and appreciated more often than females for any given work of similar quality. Furthermore, the participants added that males' opinions appeared to carry more weight than females' in their work environments. Moreover, being the minority in the nursing workforce caused them to receive unintended advantages over females in career advancement. Such observations led to the participants' view that male nurses were on a 'glass escalator' and

enjoyed accelerated career progression; thus, they were more likely to be identified as potential candidates for the APN career.

3.2.2 | Theme 2: The APN career-track is unpopular among men

Interestingly, though the odds were seemingly in their favour, male nurses were noted to lack interest in becoming APNs. Several factors might have made the APN career less appealing, especially to males.

Subtheme: Gender-stereotyped attributes influencing career choice
Males were generalized to be decisive, analytical, authoritative, and composed, based on which they were thought to be good candidates for leadership roles. Conversely, females were described as nurturing, detail-oriented, and emotionally-driven:

> … we have some men who are natural leaders, born to be leaders-type *[sic]* (P7, Female, APN)

> [institutional leaders] choose men for very big positions like managerial roles … maybe we are females, we are more emotional, I'm a female myself. I can be emotional but males they can control their emotions very well. *[sic]* (P16, Female, Student).

Given such perceived personality traits, the participants opined that males in nursing tended to gravitate towards more managerial and leadership-related career tracks and away from more clinical and education tracks within their organizations. Conversely, the minority of males who did join the APN workforce were usually motivated by their strong interest in clinical work and opportunities to develop further in clinical knowledge and skills. They also saw the APN career track as an opportunity to exercise clinical leadership.

Subtheme: Sacrifices in remuneration and career
As aforementioned, all APN candidates would require nomination and funding from their institutions. Although still technically employed by their institutions during the Master of Nursing programme and internship (which spanned about 3 years), most APN candidates experienced minimal salary increments and would not be considered for any promotions:

> … the problem is during our [Master of Nursing] studies, we do not get promoted. Whereas your peers that join [the nursing workforce] the same time as you gets promoted. I think that's a very big deterrent for most nurses, not just males, both males, and females. We do hear a lot of unhappiness about it. *[sic]* (P10, Female, APN)

Apart from these possible impacts on remuneration and promotion, uncertain career prospects and academic stringency further deterred nurses from becoming APNs. Nurses were concerned with the lack of clear career pathways for APNs, especially compared with the four more structured, conventional career pathways in nursing (clinical, management, education, and research). They might feel more inclined to choose a more structured pathway for which there were established performance indicators. Moreover, educational requirements for the other tracks were more flexible: in some institutions, it was not mandatory for nurse managers, nurse clinicians, nurse educators, or nurse researchers to be Masters-holders. In sum, although these considerations would be common to both genders, males appeared to be more affected by this, because of expectations on them to provide for their families:

> … for guys, opportunity costs and salary are very important. They must support the family. *[sic]* (P5, Female, Student)

Subtheme: Gender-based stigmatization of nursing
The participants shared that, given the widespread perception of nursing as an effeminate job, males in the profession were often described with attributes carrying unpleasant connotations:

> "It doesn't have that prestige. You tell your relative 'I'm a nurse', they say 'huh? You're a male, why are you a nurse, are you a sissy?'. Quite sadly, people also do not see nursing as a profession. *[sic]* (P12, Male, APN)

Coupled with the public's negative perceptions, such gender-based stigmatization of nursing led to low morale among male nurses, who were apprehensive about their career longevity in nursing, as shared by the participants. Consequently, they did not feel the need to develop further in their nursing career, such as the pursuit of the APN career track. Some even eventually left nursing for another profession:

> … some of the guys went to medical school, and some of them went to do property [real estate agents]. Some of them went to become insurance agents. Most of my [male] friends, they venture into business. *[sic]* (P12, Male, APN).

3.2.3 | Theme 3: Balancing the gender gap in the APN workforce

The participants did not find males' lack of interest in the APN career track concerning. Nonetheless, they did see value in disrupting the status quo of their low numbers in the APN workforce.

Subtheme: Male APNs are 'good-to-have' and not a 'must-have'
The scarcity of males in the APN workforce was not perceived to be unsettling. During the discussion on recruiting males into the

APN workforce, one participant commented that having more male APNs 'is not a must-have but more of a good-to-have' (P10, Female, APN). Such a view was shared by most other participants because the gender of the APN hardly influenced the scope and outcomes of practice:

> I feel it [gender of the APN] doesn't really matter. Because what we [APNs] do, our scope of practice, is the same for both male and female APNs. *[sic]* (P11, Male, APN).

Instead, there was a general need to recruit more committed and passionate APNs, both males and females:

> ... we need more APNs rather than need more male APN. *[sic]* (P13, Male, APN)

> it really depends on whether they have that, in Chinese we call it, 心和力 [passion and commitment] you know? Like they have that commitment and that passion to take on the role of the APN ... doesn't need to be male or female ... *[sic]* (P7, Female, APN)

Nevertheless, there was consensus among the participants that it would be healthy to have gender diversity within the APN workforce. With males and females perceived to have gender-specific traits and strengths, gender diversity within the workforce could promote better exchange of ideas:

> ... regardless of profession, it's always good to have a gender balance because different genders bring different characteristics. *[sic]* (P4, Female, Intern)

Subtheme: Good role models and better articulation of the role
To address the gender disparity in the APN workforce, the recruitment of males should be improved. Many participants cited the lack of role clarity as a deterrent for males to pursue the APN career track. It followed that exemplary APN role models would inspire early-career nurses to become APNs themselves:

> They'll [early career nurses] be like 'oh, what a good role model. I look forward to becoming like that!' ... we have a male APN in our institution, everybody looks up to him because of the knowledge that he has to offer ... the amount he has to teach. But I think his gender plays a part as well. Having a male APN does impact the number of people who wants to join the APN course. *[sic]* (P16, Female, Student]

To improve role clarity of APNs, the participants advocated the need to more accurately publicise and 'rebrand' it as a 'knowledge-intensive occupation':

> APNs should be advertised in Singapore as nurses who have the knowledge and skills that go beyond making people feel better. APNs have the clinical expertise and it is a knowledge-intensive occupation. I think this can attract more men into the nursing profession ... it's not just about us being caring, it is a knowledge-intensive occupation. *[sic]* (P4, Female, Intern)

Subtheme: 'De-gendering' the stigmatization of nursing
Through better gender diversity within the APN workforce, the participants believed that the stigma of nursing being an effeminate job would be reduced and that nursing would be viewed as an inclusive profession with diverse demographics:

> ... it tells people we are more open to having different types of people perform what used to be a very feminine role within the healthcare system. *[sic]* (P10, Female, APN)

With greater inclusivity in the APN workforce, patients, the public, and even healthcare colleagues would notice that males were developing professionally and thriving in nursing. This might contribute to reducing the gender-based stigmatization of nursing.

> If they have more male representation in the APN workforce, when patients visit the hospital, they see men doing a wonderful job in the hospital and are impressed by their care received during their hospital stay. Subsequently, the patient will change their perspectives about nursing. *[sic]* (P6, Male, Student)

4 | DISCUSSION

At present, this qualitative inquiry is the first of its kind in Asia to explore the gender disparity and recruitment of males in the APN workforce from the perspectives of males and females pursuing or in the midst of their APN careers. This study shares important insights into addressing the gender gap in the APN workforce.

Much of the existing literature drew attention to the discrimination men experience, in the form of gender role conflicts and stereotypes, throughout their nursing career (Brody et al., 2017; Younas et al., 2019). Interestingly, in this study, although gender-based stigmatization of nursing is ascertained as a longstanding issue in Singapore, men in nursing did not seem to experience discrimination with regard to professional development. Instead, males in nursing appear to be beneficiaries of opportunistic advantages in professional development. Despite the objectivity in the selection of APN candidates, males are more likely to be identified as potential candidates for APN training than their female counterparts. This can be attributed to the dominant role of females in childbearing and caregiving (Holahan, 1994) and is true even among highly intelligent females with

successful careers. A systematic review (Schlegler, 2022) on the professional state of gifted adults has reported that females would experience significant changes in their careers after the age of 35 years. Females were observed either to transit from being gainfully employed before starting a family to becoming homemakers or to remain gainfully employed without much career aspiration. Moreover, gifted females have also been reported to be more likely than gifted males to face trade-off decisions where they had to choose between their career or family: ultimately, they would gravitate towards a career that made allowances for their family planning (Schlegler, 2022). Such literature validates the findings in this study, considering that most RNs start their APN preparatory training in their 30s (Woo et al., 2020).

The term 'glass escalator' first introduced by Williams (1992), describes the underlying advantage men enjoy in female-dominated professions that facilitates their career progression. The phenomenon of such a 'glass escalator' has been underscored in this study. According to a few earlier studies, men may feel different or out of place among their female nursing colleagues but often do not feel discriminated against (Smith et al., 2020; Zeb et al., 2020). Conversely, as the minority in nursing, males have been reported by the participants to be more prominent than their females, and their positive work performances are more likely to be noticed. Such findings are echoed in Asian (Zhang & Tu, 2020) and Western (Smith et al., 2020) nursing populations. Moreover, across cultures, males in nursing have been observed to receive greater recognition from their managers than females. These observations therefore, lead to their favourable positions for career advancements (Smith et al., 2020; Younas et al., 2022; Zhang & Tu, 2020).

To address the 'glass escalator' phenomenon, an obvious implication for the management of staff would be to slow it down strategically (Brandford & Brandford-Stevenson, 2021). However, this is superfluous in the context of APN recruitment of males in Singapore. Elucidated in this study is males' disinterest in the APN role, as explained by the achievement-orientated traits of males such as decisiveness, aggressiveness, independence, and firmness (Heilman, 2001), which are found among males in nursing too. This, therefore, causes them to prefer managerial positions, for which the career progression is more certain, in their organizations.

Ironically, despite the apparent opportunistic advantages of males in nursing, the impact of gender-based stigmatization of nursing remains evident. This longstanding stigmatization makes it challenging for males to adapt to the female-dominated nursing culture, which compromises their delivery of patient care and ultimately reduces their job satisfaction (Finnegan, 2019; Younas et al., 2022). Such negative implications deter males from staying in the profession long enough to become APNs. Therefore, as demonstrated by our findings, addressing the gender gap within the APN workforce fosters a healthier and more inclusive working environment.

As elucidated in this study, experiences for males in nursing are complex, spanning from the privilege of being on the 'glass escalator' to the stigmatization for being in nursing. Although this is so, recruiting more males into the APN workforce may address the general

shortfall in the profession. Addressing this shortfall may inevitably improve nurses' working conditions (Clifton et al., 2020).

Lastly, within the context of this study, nurses have expressed apprehension on becoming APNs because of the lack of role clarity (Woo et al., 2019, 2020). Hence, a delineation of the APN role may facilitate the recruitment of APNs. More specifically, to reduce the stigmatization and encourage gender diversity in the workforce, it may be propitious to have positive male role models mentor nurses (Armitage, 2013). This has also been demonstrated in this study. Intentional mentoring of male nurses through a 'buddy' system and informal meetings may be good avenues for men to share experiences, which can help reduce feelings of isolation and exclusion. Additionally, nursing leaders and administrators should be more proactive in creating a positive and inclusive environment where male nurses are supported and accepted by patients and peers and improve their visibility (Younas et al., 2022). Such strategies are envisioned to retain males sufficiently long in nursing to pursue the APN career.

4.1 | Limitations

One limitation of this study was the purposive sampling of the participants, which was distinctive of qualitative inquiry. Though they were in various APN career stages, the participants were all recruited from Singapore, which may limit the generalizability of the findings to other countries. Nonetheless, the aim of this study was not to generalize but to promote the transferability of knowledge from one context to another. Our findings provide pioneering insights that can be transferred to other contexts in similar stages of APN development.

5 | CONCLUSIONS

Although males in nursing enjoy opportunistic advantages in entering the APN workforce, they are not interested in the role and not staying long enough in the nursing profession to become APNs. This paper offers insights into the poor recruitment of males in the APN workforce and suggestions to combat that. Further inquiry is required to understand how regulatory bodies and nursing institutions may promote a more inclusive environment that reduce gender stigmatization.

5.1 | Implications for nursing management

Nurse managers should be more cognizant of the different social stereotypes faced by males and females in nursing. With such awareness, they can be more supportive and less biased in career counselling and job appraisals. In light of the need to improve APN recruitment, institutional leaders and policy makers need to be more proactive in recruiting RNs into the APN preparatory training. Greater flexibility in the completion of the training for female candidates with children may be advantageous to increasing interest in the APN career. Positive role modelling and clear articulation of the APN role may also

improve the recruitment of both male and female candidates into the APN workforce.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

ETHICS STATEMENT

All research activities of the study were approved by the Institutional Review Board of the National University of Singapore (NUS-IRB-2021-71).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

ORIGINAL ARTICLE

Nurses' assessment of subsyndromal delirium and barriers to assessment: A cross-sectional survey in the intensive care unit

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Abstract

Aims: The aims of the study are to investigate the current status of nurses' assessment of subsyndromal delirium (SSD) in the intensive care unit (ICU) and explore possible barriers to assessment.

Background: SSD is a dynamic, recognizable disorder commonly seen in the ICU that can lead to poor patient outcomes. Timely recognition and management can prevent its progression.

Methods: A cross-sectional survey design was used to collect data from ICU registered nurses in southwest China. The online survey containing an analysis of the current status of SSD assessment and barriers was completed by 237 nurses.

Results: A total of 51.5% of nurses chose to assess SSD using an assessment tool, the most commonly used being the Confusion Assessment Method for the Intensive Care Unit; the frequency of assessment was mostly once a day (66, 41.0%) and often at shift change (178, 87.3%). There were statistically significant differences in the barrier factor scores by assessment frequency, assessment method, status of training in SSD, ability of SSD-related knowledge to meet clinical needs and willingness to receive SSD training.

Conclusion: Our study confirms that the current state of assessment of SSD in the ICU is unsatisfactory, with nurses' lack of assessment knowledge and skills, poor organization and management, and the complexity of patients' conditions being barriers.

Implications for nursing management: Nursing managers should systematically conduct training programmes on effective SSD assessment knowledge and skills, incorporate SSD assessment into the daily workflow, have standardized assessment tools, develop standardized processes and assign dedicated staff to monitor, audit and provide feedback on SSD assessments.

KEYWORDS
barriers, intensive care units, nurses, subsyndromal delirium

1 | INTRODUCTION

Delirium is a neurocognitive disorder characterized by an acute change in cognition, attention and consciousness that results in what experts describe as brain failure (Setters & Solberg, 2017). It is very common for patients in the intensive care unit (ICU) to experience delirium, especially for patients who are receiving mechanical ventilation, for whom the incidence of delirium is as high as 80% (Shehabi et al., 2010). The onset of delirium prolongs ICU stays, increases mortality, and leaves some patients with short- or long-term cognitive impairment after discharge (Devlin et al., 2018). Delirium is currently a key public health concern and a hot topic of discussion in the field of critical care medicine. Both the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) (American Psychiatric Association, 2013) and the International Classification of Diseases 11th Revision (ICD-11) (WHO, 2018) diagnostic criteria for delirium require multiple cognitive symptoms to be present. However, it has been found in clinical practice that many patients experience one or more of the symptoms of delirium but do not meet the diagnostic criteria for delirium, which scholars have labelled subsyndromal delirium (SSD) (Levkoff et al., 1996).

Partial syndromes of delirium are not a novel concept. In the 16th century, a physician wrote that the predelirious phase (paraphrenitis) could either precede a full-blown delirium or not, depending on the patient's constitution, the illness underlying the delirium, and the way it is treated Lipowski described a "predelirious" phase, in which patients with one or more symptoms of delirium never develop the full DSM-defined syndrome (Lipowski, 1990). The DSM-IV also states that individuals may manifest some but not all symptoms of delirium, which are referred to as subsyndromal presentations of delirium (American Psychiatric Association, 1994). International diagnostic authorities have taken note of this phenomenon, with the DSM-IV describing it as a subsyndromal manifestation and coding it under the classification of "undefined cognitive impairment"; in the DSM-V, SSD is listed under the classification of neurocognitive disorders with the term "attenuated delirium syndrome". The term "subsyndromal delirium" appears in the ICD-11 but is coded under a different classification than delirium, with delirium coded in chap. 6 on "mental, behavioural or neurodevelopmental disorders" and SSD coded in chap. 21. The "unclassified signs, symptoms or clinical findings" are listed under the category of "confusion". However, neither has a clear definition of SSD.

Current scholars believe that SSD and delirium belong to the same disease spectrum and are two different states of one disease (Martínez Velilla et al., 2012; Ouimet et al., 2007). Studies have shown that SSD and delirium share similar influencing factors (Cole et al., 2013; Levkoff et al., 1996). Similar to delirium, SSD also contributes to adverse outcomes such as prolonged length of hospital stay, institutionalization, decreased quality of life and cognitive impairment. The severity ranges between delirium and no delirium (Cole et al., 2013; Gao et al., 2022).

It is important to note that the progression and regression of delirium may be intermediate to SSD (Cole et al., 2003) and that there are no effective pharmacological treatment options for SSD (Devlin et al., 2018). SSD is a dynamically fluctuating disease that can progress to delirium or regress. Therefore, the early and accurate identification of SSD is important, as it can facilitate early and effective prevention and treatment, thereby reducing the adverse effects of SSD. However, in a cross-sectional survey involving 1521 patients in the ICU in 47 countries, it was found that only 42% of health care workers used an SSD detection tool correctly (Morandi et al., 2017). Nurses were only 15% to 31% sensitive to the key features of SSD, with an incorrect identification rate of 81% (Inouye et al., 2001). There is a lack of research on the current status of SSD assessment of ICU nurses and a lack of research on identifying and analysing the barriers to SSD assessment. Therefore, this study aims to understand the current status of SSD assessment among ICU nurses and analyse the barriers to SSD assessment to provide reasonable suggestions to promote the practice of SSD assessment in ICUs.

2 | METHODS

2.1 | Design

A cross-sectional survey design was used.

2.2 | Aims

This study aimed to (1) determine the current status of nurses' assessment of SSD in the ICU, (2) explore the barriers to SSD assessment and (3) provide sound recommendations to facilitate the practice of SSD assessment in the ICU. For these purposes, the following research questions were examined regarding nurses in China:

Q1. What is the current status of the assessment of SSD in the ICU?
Q2. What are the barriers that influence the assessment of SSD in the ICU?
Q3. What are their personal, professional and assessment status-related characteristics that make a significant difference in terms of factors that are barriers to SSD assessment?
Q4. What do nursing practice managers, as well as practitioners, need to be aware of to address these barriers and improve practice in the assessment of SSD in the ICU?

In line with the research questions, the research model structured using the related concepts and variables is shown in Figure 1.

2.3 | Sample and participants

The study population was drawn from seven hospitals in southwest China. Inclusion criteria were as follows: (1) registered nurses currently working in the ICU; (2) consent to participate in this study. Exclusion criteria included trainee and intern nurses. The sample was recruited through a convenience sampling method, and a total of 237 nurses participated in the survey. The sample size was calculated

FIGURE 1 Research model.
Abbreviations: ICU, intensive care unit; Q, research question; SSD, subsyndromal delirium
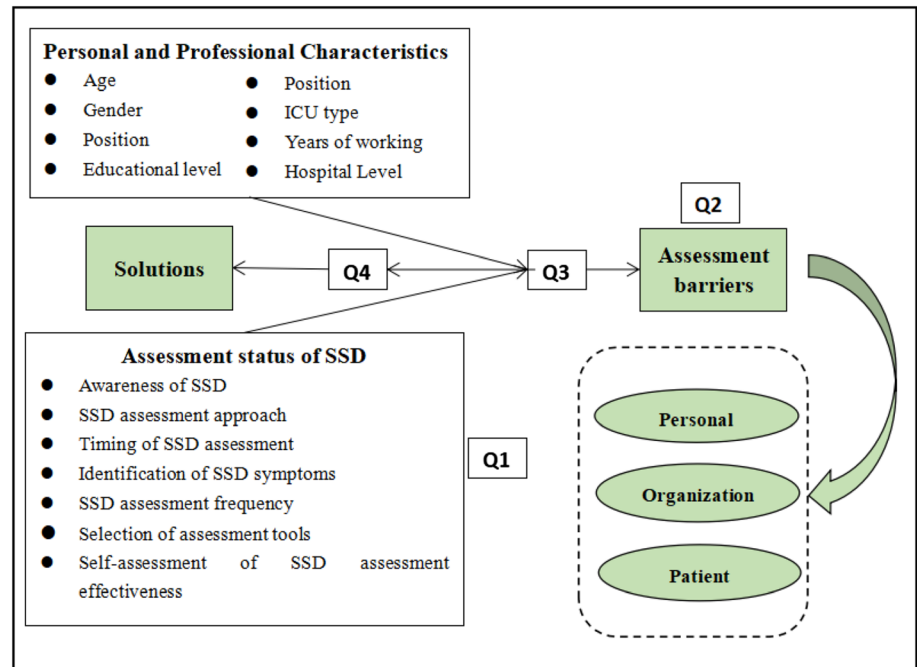
using PASS 2021 software (Version 21.0, NCSS Crop., USA), based on the formulae of the two independent samples t-test (Chow et al., 2018) and one-way ANOVA (Borm et al., 2007), with the mean of each group in the pretest as a parameter ($\alpha = .05$, $\beta = .1$). The power analysis showed the required sample size of nurses was a maximum of 111 cases, and considering the 20% invalid questionnaire and sampling error, it was reasonable to distribute 237 cases.

2.4 | Data collection

The researcher's unit is a tertiary care public hospital qualified to hold specialist nurse training in ICUs. Each year, the intensive care medicine unit recruits specialist nurse trainees from outside the unit for a 3-month training period to obtain a qualification as specialist nurses in intensive care medicine. The survey was conducted from 9 February to 28 April 2022 using Questionnaire Star (an online crowdsourcing platform in China). The questionnaire was distributed in two steps: first, the questionnaire was distributed to the WeChat groups (a widely used social media platform in China) of 40 specialist trainees, inviting them to participate in the survey; second, the research team used convenience sampling to contact the managers of seven specialist trainees' organizations, and the managers distributed the questionnaire to their WeChat groups.

2.4.1 | Study instruments

The survey consisted of four parts: (i) guiding words, (ii) demographic and professional information, (iii) an ICU nurse SSD assessment status questionnaire and (iv) a SSD assessment barrier questionnaire. The questions used in the survey were based in part on previous research (Li et al., 2016). Prior to the start of this study, five experts in the fields of neurocritical care, critical care medicine and nursing were invited to review the content of the questionnaire. Among the five experts, three held master's degrees and two held bachelor's degrees; the experts included two supervising nurse practitioners, one deputy chief nurse practitioner, one chief nurse practitioner, and one deputy chief physician. The survey was reviewed twice by the experts to refine the questions and responses and to incorporate suggested changes into the survey. An online version of the survey was later sent to 20 practice nurses whose responses and feedback were used to assess formatting, logic checks, clarity of responses and the time taken to answer questions.

Guiding words

The guiding words explained to the respondent the content and purpose of the study and asked the respondent to provide informed consent. Guidance on the dos and do nots of completing the questionnaire was provided, and it was explained that participation was completely anonymous and voluntary and would not involve the disclosure of personal information.

Demographic and professional information

The sociodemographics of participants were collected. This information included the following: participants' age, gender, educational level, position, years of working in the ICU, position, hospital level and type of ICU.

SSD assessment status questionnaire

This questionnaire consisted of 12 questions, including the following: (1) Have you ever learned about SSD? (2) Have you ever cared for a

subject with SSD? (3) What are the symptoms that determine SSD? (4) When and how often do you assess SSD at work? (5) What is the timing and frequency of SSD assessment? (6) Are you capable of SSD assessment? (7) Does SSD-related knowledge meet clinical needs? (8) Are you willing to participate in SSD training? and (9) What is your preferred training approach?

SSD assessment barriers questionnaire

The section was informed by cognitive, behavioural, social influence and marketing theories (Grol & Grimshaw, 2003) and contained 28 items in three dimensions: the individual, organizational and patient levels. At the individual level, there were 14 items on nurses' awareness, attitudes, knowledge and competence in SSD assessment; at the organizational level, there were 9 items on human resource arrangements, feedback and evaluation systems, relevant institutional requirements, and procedures for SSD assessment; and at the patient level, there were 5 items on the assessment of sedated and mechanically ventilated patients and patients' conditions and lack of cooperation. Each item was rated on a 5-point Likert scale, where *strongly disagree*, *disagree*, *unclear*, *agree* and *strongly agree* were scored as 1, 2, 3, 4, and 5 points, respectively; the higher the score was, the more relevant the implementation process was to the factor. The content validity indexes were determined to be 0.94 for the individual level, 0.93 for the organizational level, 0.93 for the patient level and 0.94 for the total questionnaire. The results of the presurvey of 20 nurses showed Cronbach's alpha coefficients of .869 at the individual level, .911 at the organizational level, .868 at the patient level and .941 for the total questionnaire.

2.5 | Data analysis

Data were exported in an Excel file (Microsoft Corp., Redmond, WA, USA) and analysed by SPSS 26.0 statistical software (IBM Corp., Group NY). The significance level was considered to be $p \leq .05$. Descriptive analysis was applied to the general data. Count data are expressed as frequencies and percentages; measurement data are expressed as the means $\pm$ standard deviations. The mean $\pm$ standard deviation is used to express the score of each dimensional barrier factor. Differences between groups were compared for dichotomous variables using two independent samples t-tests for group comparisons and one-way ANOVA for multiclass variables.

2.6 | Ethical considerations

Ethical approval was obtained from the Ethics Committee of the Second Hospital of Chongqing Medical University (Date: 26 August 2021, Number: 2021-74). Nurses who agreed to participate in the study were contacted via social media and provided their data. Participants' consent was obtained on the first page of the online data collection tool, which contained information regarding the research aim, scope, and ethical issues. After completing the questionnaire, each participant received payment; there was no hierarchical relationship between the participants and the researchers.

3 | RESULTS

3.1 | Participants

A total of 237 ICU nurses participated in this study. The nurses were mainly from secondary and tertiary public hospitals, with Grade A tertiary hospitals accounting for the majority (207, 87.3%), and most of the nurses were from general ICUs (168, 70.9%). The majority of the nurses were female (214, 90.3%). The age range was mostly between 26–30 (103, 43.5%) and 31–40 years (87, 36.7%). With regard to the level of education, the majority of the respondents had a bachelor's degree (199, 84.0%), followed by an associate degree (30, 12.7%) and a master's degree (8, 3.4%). In addition, the majority of the survey respondents had a junior title (119, 50.2%) and worked in clinical nursing (200, 84.4%) (Table 1).

3.2 | Nurses' assessment of SSD in ICUs

The survey found that 70% of nurses had cared for subjects with SSD in the course of their work, indicating that SSD is relatively common in the ICU. The timing of the assessment was most frequent at shift handover (178, 87.3%) or when the patient's cognition changed (166, 81.4%), with a frequency of once a day being the most common (66, 41.0%). In terms of assessment methods, 51.5% of the nurses chose to use an assessment tool, with CAM-ICU being the most commonly used assessment tool; a further 35.8% chose to draw on their own clinical experience for assessment. However, 37.1% and 41.4% of nurses were unsure of whether the assessment tool and clinical experience would be accurate in assessing SSD, respectively (Table 2).

When the ICU nurse identified SSD, the five most common clinical signs that indicated the presence of SSD were confused thinking, multilingualism, rapid changes in mental status, hallucinations and loss of sanity, while the five least common clinical signs were expressionlessness, delayed movement, depression, slow reaction and disorientation, as shown in Figure 2.

In addition, regarding whether the nursing competencies of the ICU met the clinical care needs of patients with SSD, only 30.0% of nurses felt that their competencies met the requirements. Only 26.6% of the nurses had received training in SSD-related knowledge. The majority of the nurses wanted to attend SSD training (211, 89.0%), and the most preferred method of training was to attend an SSD course (91, 38.4%).

3.3 | Barriers to assessing of SSD in ICUs

The means and standard deviations of the dimensions of each barrier factor are shown in Table 3. The results showed that the

TABLE 1 Demographic and professional information of the participants (N = 237)

Characteristics	Option	Answer (n)	Frequency (%)
Gender	Male	23	9.7
	Female	214	90.3
Age (years)	18–25	41	17.3
	26–30	103	43.5
	31–40	87	36.7
	41–50	6	2.5
Education	Diploma/associate's degree	30	12.7
	Bachelor's degree	199	84.0
	Master's degree	8	3.4
Years of clinical nursing	<0.5	30	12.7
	0.5–1	42	17.7
	2–5	55	23.2
	6–10	67	28.3
	11–20	42	17.7
	>20	1	0.4
Primary position	Staff nurse	200	84.4
	Educating nurses	29	12.2
	Head nurse	8	3.4
Professional title	Nurse	53	22.4
	Nurse practitioner	119	50.2
	Nurse-in-charge	59	24.9
	Professor of nursing	6	2.5
Work department	GICU	168	70.9
	SICU	17	7.2
	MICU	37	15.6
	EICU	9	3.8
	NICU	4	1.7
	RICU	2	0.8
Hospital level	Grade A tertiary hospital	207	87.3
	Grade B tertiary hospital	5	2.1
	Grade A secondary hospital	22	9.3
	Grade B secondary hospital	3	1.3

Abbreviations: EICU, emergency intensive care unit; GICU, general intensive care unit; MICU, medicine intensive care unit; n, number; NICU, neurological intensive care unit; RICU, respiratory intensive care unit; SICU, surgical intensive care unit.

differences by age, gender, education level, years of ICU experience, title, position, ICU type and hospital level were not statistically significant in the SSD assessment between individual-level barrier factors and total barrier factor scores. However, the scores for the organizational level barrier factors showed statistically significant differences by education level ($p = .012$) and level of health care facility ($p = .028$). In addition, the gender differences ($p = .028$) and years of working ($p = .05$) for the ICU nurses in the patient-level barrier factor scores showed statistical significance (Appendix S1).

Differential comparison of the current status of assessment of SSD in the ICU revealed statistically significant differences in barrier factor scores by frequency of assessment, mode of assessment, training status in SSD-related knowledge, self-assessed ability of SSD-related knowledge to meet clinical needs and willingness to receive SSD training (Table 4). In contrast, there was no significant difference between the scores on the barrier factors for the different assessment tools and the time of the most recent training.

4 | DISCUSSION

This study surveyed 237 registered nurses in the ICUs of seven hospitals and found that the current status of SSD assessment was

TABLE 2 Current status of subsyndromal delirium assessment in ICU nurses

Questions	Options	Answers (n)	Frequency (%)
Have you ever known SSD (n = 237)	Yes	138	58.2
	No	61	25.7
	Unsure	38	16.0
Have cared for a patient with SSD (n = 237)	Yes	166	70.0
	No	33	13.9
	Unsure	38	16.0
SSD evaluation frequency at work (n = 161)	No assessment	23	14.3
	Once a day	66	41.0
	Twice a day	32	19.9
	Three times a day	19	11.8
	More	21	13.0
Timing of SSD assessment at work (n = 204)	Routine assessment	108	52.9
	Shift changeover	178	87.3
	Cognitive changes	166	81.4
	Mood swings	82	40.2
	Use of cognitive impairment drugs	115	56.4
	Others	4	2.0
SSD assessment methods (n = 204)	Personal clinical experience	73	35.8
	Using the assessment tools	105	51.5
	Through doctors' consultations	26	12.7
Whether clinical experience can accurately assess SSD (n = 73)	Yes	23	31.5
	No	20	27.4
	Unsure	30	41.1
Assessment tools used (n = 105)	CAM-ICU	61	58.1
	ICDSD	10	9.5
	RASS	34	32.4
Whether the assessment tool can accurately assess SSD (n = 105)	Yes	59	56.2
	No	7	6.7
	Unsure	39	37.1
Whether trained in SSD assessment (n = 237)	Yes	63	26.6
	No	153	64.6
	Unsure	21	8.9
Date of last training (n = 63)	Less than 1 month	13	20.6
	Less than 3 month	10	15.9
	Less than 6 month	15	23.8
	More than 1 year	25	39.7
Does your SSD-related knowledge meet clinical care needs (n = 237)	Yes	71	30.0
	No	111	46.8
	Unsure	55	23.2
Willingness to be trained in SSD knowledge (n = 237)	Yes	211	89.0
	No	26	11.0
Preferred training method (n = 237)	Studying at school	1	0.4
	Academic conferences, lectures	60	25.3
	SSD related learning course	91	38.4
	Self-learning	10	4.2

(Continues)

TABLE 2 (Continued)

Questions	Options	Answers (n)	Frequency (%)
	Specialist nurse training	31	13.1
	Communication between colleagues	4	1.7
	Online education platform for medical/nursing professions	40	16.9

Abbreviations: CAM-ICU, the Confusion Assessment Method for the Intensive Care Unit; ICU, intensive care unit; ICDSD, the Intensive Care Delirium Screening Checklist; n, number; RASS, Richmond Agitation–Sedation Scale; SSD, subsyndromal delirium.
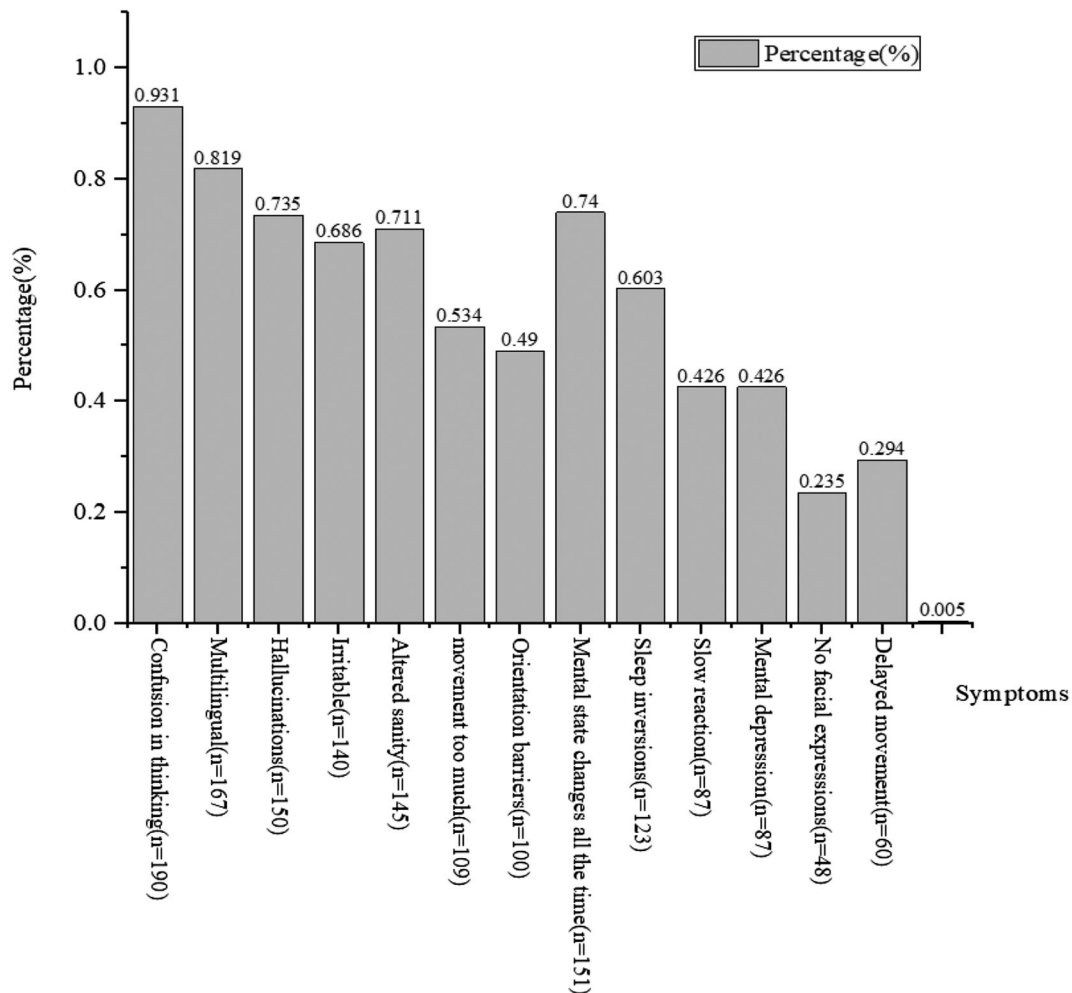
FIGURE 2 Determine the clinical signs of a subject experiencing subsyndromal delirium

unsatisfactory and that there were many factors that prevented ICU nurses from assessing SSD.

The survey showed that 70% of the nurses had cared for patients with SSD in the course of their work, indicating that SSD is common in the ICU. This is similar to the findings of previous studies, where the incidence of SSD in the ICU ranged from 31.4% to 49.7% (Azuma et al., 2019; Bastos et al., 2019; Yamada et al., 2018). However, it is worth noting that only 58.2% of the nurses in the study had knowledge of SSD, which is similar to the Miao FF study (Miao, 2020), indicating a low level of awareness of SSD among ICU nurses.

Regarding the choice of SSD assessment method, 51.5% of the nurses chose to use an assessment tool, with the most commonly used assessment tool being the CAM-ICU (61, 58%). This is in line with the guideline opinion recommendations (Devlin et al., 2018). The CAM-ICU was originally validated in 96 adult patients at Vanderbilt University Medical Center (USA) in a medical or coronary ICU. Compared with the reference standard used for diagnosing delirium, the CAM-ICU had a sensitivity of 100% and 93%, specificity of 98% and 100% and high interrater reliability ($\kappa = 0.96$; 95% confidence interval CI [0.92, 0.99]) (Ely et al., 2001). The CAM-ICU is simple and easy to

TABLE 3 Subsyndromal delirium assessment barrier factor score

Item	Ranking	Barriers	Score (mean ± SD)
Individual level	1	Lack of knowledge in the differential diagnosis of SSD	3.61 ± 0.898
	2	Not fully grasping the care of SSD prevention	3.51 ± 0.909
	3	In the ICU, it is difficult to achieve timely and repeated assessments of SSD	3.50 ± 0.900
	4	Assessment tools for SSD not fully mastered	3.44 ± 0.966
	5	It is believed that current assessment tools are not good enough to diagnose SSD	3.42 ± 0.911
	6	No access to an authoritative knowledge of SSD	3.32 ± 0.942
	7	Lack of understanding of the specific clinical presentation of SSD	3.18 ± 0.998
	8	Not trusting the results of your assessment of SSD	3.14 ± 0.937
	9	People who are not aware of the high risk of SSD occurring	3.13 ± 1.042
	10	Not knowing the main risk factors for SSD	3.10 ± 1.018
	11	Increased workload	2.82 ± 1.015
	12	SSD assessment is not considered to improve patient prognosis	2.64 ± 1.018
	13	SSD assessment is a matter for the doctor, not yourself	2.24 ± 0.925
	14	SSD assessment is not important to focus on	2.17 ± 1.012
		Total average score at the individual level	3.09 ± 0.674
Organization level	1	Lack of time for SSD assessment due to heavy workload in the department	3.40 ± 1.014
	2	Lack of multidisciplinary teamwork	3.32 ± 1.013
	3	The department does not provide process specifications for SSD assessments	3.30 ± 1.086
	4	Lack of incentives	3.29 ± 1.027
	5	No SSD management rules in the department	3.28 ± 1.033
	6	SSD assessment skills training is not provided in the department	3.25 ± 1.066
	7	The section does not require routine assessment for SSD	3.21 ± 1.076
	8	The section does not provide the relevant tools for SSD assessment	3.16 ± 1.106
	9	The results of the SSD assessment are not taken seriously by the department and are not fed back on time	2.92 ± 1.073
		Total average score at the organizational level	3.24 ± 0.877
Patient level	1	Difficulties in implementing SSD assessment for intubated patients	3.77 ± 0.769
	2	Difficulties in implementing SSD assessment for sedated patients	3.77 ± 0.808
	3	Difficulty distinguishing SSD from mental cognitive disorders such as dementia	3.65 ± 0.884
	4	Subjective lack of patient cooperation makes assessment difficult	3.62 ± 0.812
	5	Difficulties in assessing patients with severe neurological impairment	3.78 ± 0.765
		Total mean score at the patient level	3.72 ± 0.686

Abbreviations: ICU, intensive care unit; SD, standard deviation; SSD, subsyndromal delirium.

use and provides a rapid assessment of delirium and SSD, but the assessment is qualitative dichotomous and does not show the dynamics of the patient's severity in terms of scores. Clinical practice guidelines also recommend that the Intensive Care Delirium Screening Checklist (ICDSC) identify patients with SSD (Devlin et al., 2018; Stollings et al., 2021). The ICDSC was initially validated in 93 patients at Maisonneuve-Rosemont Hospital in Montreal, Quebec, Canada. The predictive sensitivity of ICDSC was 99%, but the specificity was only 64% (Bergeron et al., 2001). The changes in assessment values can also clearly show the changes in the patient's condition. Therefore, the combined use of the CAM-ICU and ICDSC can help to solve the problem of the dichotomous assessment of the CAM-ICU scale without visual changes in values and improve the problem of the low

specificity of the ICDSC scale by combining qualitative and quantitative aspects in the assessment process, but its clinical effectiveness still needs to be further tested. In addition, 37.1% of nurses who used the assessment tool were still unsure about the effectiveness of the tool in assessing SSD, indicating that the importance, use and proficiency of the SSD assessment tool among health care staff could be strengthened and improved.

Notably, our survey found that 35.8% of nurses used clinical experience to identify SSD, but 41.1% of these were not sure if it was accurately assessed, which to some extent reflects a low level of SSD awareness, in line with previous studies (Miao, 2020; Ning et al., 2019; Wang et al., 2020). In our study, only 26.6% of nurses had received training related to SSD assessment, and 70% felt that

TABLE 4 Univariate analysis of factors impairing the assessment of subsyndromal delirium in ICU nurses

	n	Score (mean ± SD)	Statistical values	p
Assessment frequency			10.598[a]	<.001[**]
No assessment	23	3.69 ± 0.522		
Once a day	66	3.28 ± 0.522		
Twice a day	32	2.85 ± 0.628		
Three times a day	19	3.08 ± 0.567		
More	21	2.75 ± 0.724		
Assessment methods			15.708[a]	<.001[**]
Personal clinical experience	73	3.47 ± 0.514		
Using assessment tools	105	3.01 ± 0.623		
By doctor's consultation	26	3.40 ± 0.484		
Assessment tools used			1.346[a]	.265
CAM-ICU	61	3.08 ± 0.572		
ICDSD	10	2.80 ± 0.593		
RASS	34	2.92 ± 0.707		
Whether trained in SSD			18.754[a]	<.001[**]
Yes	63	2.86 ± 0.748		
No	153	3.40 ± 0.502		
Unsure	21	3.30 ± 0.633		
Date of last SSD training			1.583[a]	.203
Less than 1 month	13	2.94 ± 0.763		
Less than 3 month	10	2.45 ± 1.076		
Less than 6 month	15	2.79 ± 0.557		
More than 1 year	25	3.03 ± 0.656		
Does SSD-related knowledge meet clinical needs			15.872[a]	<.001[**]
Yes	71	2.99 ± 0.776		
No	111	3.47 ± 0.506		
Unsure	55	3.13 ± 0.481		
Willingness to be trained in SSD knowledge			−4.943[b]	<.001[**]
Yes	211	3.18 ± 0.604		
No	26	3.80 ± 0.587		

Abbreviations: CAM-ICU, the Confusion Assessment Method for the Intensive Care Unit; ICDSD, the Intensive Care Delirium Screening Checklist; n, number; RASS, Richmond Agitation–Sedation Scale; SD, standard deviation; SSD, subsyndromal delirium.

[a]t-test coefficient.
[b]Analysis of variance (ANOVA); p, statistical significance.
*p ≤ .05.
**p ≤ .001.

their competencies were not adequate for clinical needs. This reminds managers of the importance of training in SSD-related knowledge and improving the ability of ICU nurses to recognize and manage SSD symptoms.

ICU nurses assessing SSD currently have many barriers. The individual-level barriers included nurses' perceptions, attitudes, knowledge and competencies regarding SSD assessment. The results showed that the top three barrier factors were lack of knowledge related to the differential diagnosis of SSD, incomplete knowledge of nursing measures for SSD prevention and difficulty in achieving timely and repeated assessment of SSD in the ICU. Distinguishing SSD from other psychiatric cognitive disorders remains difficult as there is still a lack of uniform criteria for defining SSD and its diagnosis still requires the use of delirium assessment tools (Meagher & Trzepacz, 2007). Guidelines recommend the use of nonpharmacological means to treat SSD, but specific nonpharmacological interventions for treatment still need further clinical validation (Devlin et al., 2018). More research is needed to explore SSD assessment skills, as there is a lack of assessment and status surveys on SSD assessment skills. Furthermore, in the survey on the importance of SSD assessment, nurses did not consider SSD to be unimportant and they believed that SSD assessment would have a favourable impact on patient prognosis, which is

consistent with the findings of several studies (Miao, 2020; Ning et al., 2019; Wang et al., 2020). This indicates that nurses have a positive attitude towards SSD assessment, which provides strong support for the development of follow-up training.

The top three organizational-level barriers were a busy department and lack of time to conduct SSD assessments, a lack of multidisciplinary teamwork and a department that did not provide process specifications for SSD assessments. Chang and Yu (2016) showed that the work of ICU nursing staff conformed to a heavier workload and that nursing work was significantly associated with quality of care, prompting nursing managers to rationalize nursing staffing in the ICU and reduce the workload of nursing staff. Departments do not give enough attention to SSD assessment, and the standardization process, management rules and multidisciplinary teamwork need to be further improved. Interestingly, there were statistically significant differences in the organizational level barrier factors by nurses' level of education and the level of the hospital in which they were worked ($p < .05$). As the level of education increased, so did the scores for the organizational level barrier factor. This may be because nurses with higher levels of education are more likely to be in managerial positions and are more likely to view problems from an organizational management perspective. In addition, the higher the hospital level was, the lower the score on the organizational barrier factor. This may be because higher-ranking hospitals have more well-established departments.

Patient-level scores were high for all barrier factors. Patients undergoing intubation and sedation can be influenced by the assessor's subjective factors, as their consciousness is more difficult to assess (Robinson et al., 2013). This can serve as a reminder for health care professionals to be diligent in observing these patients so that they are not missed. In addition, there was a significant difference in the assessment of SSD at the patient level between nurses of different genders ($p = .028$), with the majority of nurses in this survey being female, but the reasons for this need to be further investigated and explained.

4.1 | Limitations

There are several limitations to this study. First, the survey was conducted in only one city in China, so there are limitations to the generalizability of the results. Second, the results of the study covered only six common types of adult ICUs, as well as data not received, for example, cardiac ICUs and paediatric ICUs. Third, although the sample of hospital nurses was appropriate, only a small number of nurses from tertiary and secondary B hospitals participated. Fourth, this study used a quantitative research approach to prospectively identify some of the barriers, and although the questionnaire had fill-in-the-blank questions for the study participants to fill in other barriers, the number filled in was not very high. Therefore, it is recommended that future qualitative studies be conducted to explore other barriers to SSD assessment from multiple perspectives, including those of nursing staff, clinicians and psychiatrists.

5 | CONCLUSION

This study investigated and analysed the current situation of and barriers to the assessment of SSD among ICU nurses in the hospital, suggesting that the current situation of SSD assessment needs to be improved, with lack of knowledge and competence among nurses, high work pressure among ICU nurses, lack of attention from nursing managers and the complexity of patients' conditions being the main barriers to assessment. An effective SSD assessment knowledge and skills training programme should be systematically implemented, and the workflow should be improved at the organizational level to provide conditions and support for SSD assessment, facilitate the practice of SSD assessment in the ICU, identify SSD at an early stage and intervene at an early stage to reduce the risk of SSD advancing to delirium for ICU patients.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

Nursing managers should emphasize SSD assessment practices and systematically conduct effective training programmes on SSD assessment knowledge and skills in the ICU, including an overview of the background knowledge of SSD assessment, the use of assessment tools and precautions and reinforcement of assessment difficulties and key points, especially for sedated and intubated patients; training methods should include regular SSD-related training, supplemented by academic conferences and lectures; in addition, posters or pamphlets on SSD assessment can be displayed or distributed to enhance the learning atmosphere. Departments should integrate SSD assessment into their routine workflow, have standardized assessment tools, develop a standardized process, define the frequency of assessment and recording methods and arrange for a dedicated person to be responsible for monitoring, auditing and providing feedback on SSD assessment in order to standardize and promote the practice of SSD assessment from an organizational level. In addition, the SSD assessment process should be integrated into the intensive care information system with reminders and alerts, or intelligent SSD assessment tools, such as an app, should be developed for bedside use by nurses to improve their compliance and efficiency in SSD assessment.

There is currently no clear definition of SSD and no specific assessment tool, and its diagnosis and assessment are based on the core symptoms of delirium or assessment tools. Pharmacological treatment has not been shown to be effective in alleviating SSD, and nonpharmacological interventions have been recommended by national and international scholars, although the effectiveness of nonpharmacological interventions needs to be further tested. Therefore, exploratory and empirical studies could be conducted in the future to improve the understanding of SSD and to establish uniform and targeted diagnostic criteria for SSD. In addition, effective interventions and nonpharmacological treatment options for SSD, such as cluster strategies, early rehabilitation, daily

arousal combined with music therapy, cognitive training and other nonpharmacological treatments for delirium, could be explored in the future.

CONFLICT OF INTEREST

None. This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sector.

ETHICS STATEMENT

Ethical approval was obtained from the Ethics Committee of the Second Hospital of Chongqing Medical University (Date: 26 August 2021, Number: 2021-74).

DATA AVAILABILITY STATEMENT

The datasets used or analysed during the current study are available from the corresponding author on reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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REVIEW ARTICLE

WILEY

The implementation and outcomes of self-managing teams in elderly care: A scoping review

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Abstract

Aim: We aim to map the existing evidence and gaps in research on the implementation and outcomes of self-managing elderly care teams.

Background: Due to increasing demand for elderly nursing care and an ageing workforce, recruiting and retaining community nurses have become challenging. Implementing self-managing teams may be a solution to address this problem.

Evaluation: This scoping review included 27 studies, varying from narrative reviews to a quantitative cross-sectional study. The studies' primary focus on self-managing teams was essential for eligibility.

Key issues: Nurses' job satisfaction was high in self-managing teams due to improved relationships with patients and increased autonomy. Continuity of care and patient acceptability were high. Transformation of managers to coaches in a team with a flat hierarchy is needed to empower nurses with responsibility for their own work. Trust and teamwork should be assisted by suitable ICT support systems.

Conclusions: International interest in self-managing teams is large, but quantitative research is limited and guidelines for implementation are needed. Recommendations for potential successful implementation were made.

Implications for Nursing Management: Nurse autonomy and job satisfaction can increase by implementing self-managing teams. This requires a change in management styles, from managing to coaching nurses.

KEYWORDS
elderly care, job satisfaction, nurses, scoping review, self-managing teams

1 | INTRODUCTION

In light of demographic change, people become more dependent on health care services as a result of ageing-associated chronic conditions (Kalache & Keller, 2000). As health care system dependency increases, more people require care at home (Robinson & Reinhard, 2009). Hence, homecare community nurses have a crucial role in managing the care of older people with chronic conditions (Lalani et al., 2019).

The use of homecare services may lead to a reduced use of in-house care services in hospitals and nursing homes. Serious conditions

and diseases could potentially be prevented at an early stage as community nurses proactively support patients in addressing health and well-being problems (Drennan, Calestani, et al., 2018). However, due to the increasing demand for nursing care and an ageing workforce, it has become challenging to recruit and retain community care nurses (Drennan, Calestani, et al., 2018). Increased work pressure and work-related stress have resulted in a high level of staff turnover, which makes working in this sector less appealing and creates a workforce shortage (Lalani et al., 2019). This results in less time to be spend per patient and potential fragmentation of care. Previous studies have aimed to improve working conditions and care outcomes through the introduction of self-managing elderly care teams (SMTs). These small nursing teams provide holistic patient-centred neighbourhood care, without bureaucratic organization structures and with more nurse autonomy and individual leadership. Increasing work autonomy is associated with increased employee performance and job satisfaction (Yeatts & Seward, 2000).

Although the implementation of these teams has been successful in elderly homecare in the Netherlands (de Veer et al., 2008), it seems difficult to reproduce these outcomes at a similar level and scope elsewhere. Therefore, this scoping review maps the evidence on the practical implementation aspects and outcomes of SMTs at various implementation sites to put light on variation to implementation under the label of SMT that potentially can be linked to differences in outcomes. It focusses on the implementation of the following SMT features; teamwork and management and ICT and back-office support. Furthermore, literature is scoped on outcomes of care provided by SMTs, being patient and employee satisfaction and challenges for implementation.

First, more background information on the development of SMTs is given. Second, the aims, research design and search methods as well as the methods for result synthesis are described. Subsequently, the study characteristics of the included articles are described, followed by the synthesis of the results. Lastly, the results are analysed in the discussion and the strengths and limitations of this scoping review are reflected.

2 | BACKGROUND

Since the 1970s and 1980s, a holistic self-managed team approach instead of the traditional linear product development, was considered to better serve the rapidly changing economy. Working in SMTs aimed to address high employee turnover and increase performance and job satisfaction (Yeatts & Seward, 2000). The product development process was to be fuelled by a collaborative, multidisciplinary team. Personnel was empowered to contribute their personal skills and the team was expected to take responsibility and monitor its own performance (Narayan et al., 1996). Companies invested in employees instead of attempting to cut the labour costs. The main focus was on enhancing commitment, skills and knowledge and henceforth improve productivity (Bishop, 2014; Wageman, 1997). The implementation of SMTs quickly became the driver of successful businesses (Narayan

et al., 1996) and the potential of SMTs in the health care sector was recognized soon. Hence, the appearance of this new management style within elderly care is part of a longer continuum.

2.1 | Self-managing teams in Dutch homecare

Since the 1990s, reforms have been made in the Dutch homecare sector and homecare organizations were merged to create economies of scale (Nandram & Koster, 2014; Schouteten, 2004). This resulted in a more 'production' oriented vision and care provision became more managerially focussed. As a result, nurses felt a loss of autonomy and a reduction of quality of care. Job satisfaction decreased due to time pressure and working overtime, which led to higher turnover (Drennan, Calestani, et al., 2018; Jantunen et al., 2020). Homecare nurses had more patients to take care of, but less time and autonomy resulting in stress, burn-out and eventually resignation (Ruotsalainen et al., 2020).

As a result of these developments, Buurtzorg Nederland was launched in 2007, being a patient-centred model of care with SMTs of community nurses. Buurtzorg Nederland emphasizes the autonomy of nurses, leaving decision-making on the delivery of care with them. The team has a flat hierarchy and 'coaches' instead of traditional managers (Monsen & deBlok, 2013). Nurses are expected to support each other and rely on teamwork for completion of tasks. Administrative tasks are minimized by having an online system in which nurses can access scheduling and patient records. Buurtzorg aims to improve patient outcomes, reduce the costs of homecare services and increase both patient and nurse satisfaction (Monsen & de Blok, 2018). Furthermore, care is integrated meaning that the clients, their community networks and other care providers such as general practitioners (GPs) are involved in the chain of care (Nandram & Koster, 2014). Nurses aim to engage the patient and families in the care process, teaching them the essential practicalities of care provision for situations when the nurse might be absent. This may result in a reduced appeal on emergency care services. Thus, the implementation of SMTs in elderly homecare and nursing home care potentially addresses the issues of high demands on care services and nurse turnover.

The Buurtzorg model has gained appreciation widely, but there is very little evidence of the success of the model in other countries. As the service systems vary there may be different barriers in implementing SMTs elsewhere. It is clear that using SMTs would change the service system and the management of services thoroughly, by diminishing the number of managers, by changing the role of managers and the management culture.

3 | METHODS

3.1 | Aims and design

This scoping review aimed to systematically map the existing published and grey literature on SMTs and identify the available evidence

in this field (Booth et al., 2016). It was aimed to gain insight into the existing research on the implementation and outcomes of SMTs and potential challenges that may arise. The available evidence was mapped, in order to generate information relevant to management and to inform policymakers. Specifically, we were interested in the implementation process taken under the label of SMTs by decision-makers and nursing managers and how they potentially explained variety in reported outcomes. Hence, this research was guided by the question: What is the evidence on the implementation and outcomes of SMTs in elderly care?

Due to the heterogeneity of the literature, a scoping review was conducted to map the existing scientific knowledge. The five-step methodological framework of Arksey and O'Malley (2005) was used and these steps were approached iteratively. The PRISMA checklist for Scoping Reviews was used to guide this review and increase the rigour of reporting (Tricco et al., 2018) (see Appendix 2). A review protocol was not created for this study.

3.2 | Search methods

Following the five-step methodological framework of Arksey and O'Malley (2005), relevant studies were identified by searching the CINAHL 1990–2021, EMBASE, Medline, OVID and EBM Reviews 1974–2021 databases. The search strategy was reviewed by two reviewers (J. B. and R. D.) and was tested, refined and lastly performed on 16 June 2021 (Table 1).

No specific time limits for publication were used. Studies were included when focussing on SMTs (Table 2). These SMTs are characterized by, among others, team autonomy, a flat hierarchy and being small in size. A specific focus on SMTs in the elderly homecare and

nursing home care settings was required. Hence, studies analysing a patient's self-management of disease treatment and the training of nurses in self-management of disease treatment were excluded. Only studies reported in English were included. Qualitative, quantitative and mixed-methods studies, as well as literature reviews and narrative reviews were included. Editorials, conference abstracts, letters to the editor and opinion pieces were excluded.

Following the inclusion- and exclusion criteria, abstracts and titles of the search results were screened by the two reviewers using the Rayyan application for systematic reviews (Ouzzani et al., 2016). Disagreement between the reviewers was solved through consensus. Included articles were full-text screened by the same reviewers. During the full-text analysis, reference lists were searched manually for additional relevant studies. Subsequently, the search outcomes were screened.

3.3 | Search outcomes

Performing the search strategy yielded a total of 1594 citations, of which 977 unique citations. After screening the titles and abstracts, 45 studies were considered eligible for full-text reading (Figure 1). Reference lists of studies included for full-text reading were screened, resulting in an additional six relevant articles. Eighteen articles were excluded after full-text reading of which SMTs were a confounding variable in five studies. Three articles focused on nursing in general, three citations were conference abstracts and two news articles were retrieved. One study did not focus on elderly care but on community nursing in general. Furthermore, one article was not in English, one study was an editorial and one opinion piece was excluded. Due to deceased existence of the journal, one full-text article was unavailable. Twenty-seven studies were included, being narrative reviews, literature reviews, case studies, qualitative evaluations and quantitative cross-sectional studies.

3.4 | Quality appraisal

Given the nature of scoping reviews, a risk of bias assessment was not conducted in this study. A scoping review aims to give an

TABLE 1 Search strategy performed in CINAHL, Embase, Medline, OVID and EBM reviews on 16 June 2021

1.	Self-directed OR self-organizing OR autonomous team* OR self-manag* OR self-regulat* team* OR Buurtzorg
2.	Homecare OR home-care OR community care OR neighbourhood care OR district nursing OR community nursing OR assisted living OR nursing home
3.	1 AND 2

TABLE 2 Inclusion/exclusion criteria

	Population	Intervention (or situation, exposure, context)	Language	Study design
Inclusion	Nurses in self-managing teams, meaning teams with aspects such as autonomy, flat hierarchy, small team structures	Self-managing teams in elderly care	English	All types of study designs, including qualitative, quantitative, mixed methods, literature reviews, reports
Exclusion	Studies focussing on nurse training and/or education	Self-management of disease treatment through, e.g., telehealth or training programmes for the patient	Non-English	Editorials, conference abstracts, letters to the editor, opinion pieces

FIGURE 1 PRISMA flowchart of literature search (Moher, 2009)

overview of the existing evidence and literature on a specific topic, meaning that the retrieved study designs are heterogeneous. Scoping reviews usually pose broad questions and it is therefore uncommon to specifically assess the quality of retrieved studies (Arksey & O'Malley, 2005). Low quality study designs such as editorials, conference abstracts, letters to the editor and opinion pieces were excluded to account for a reasonable quality of results.

3.5 | Synthesis

Based on an initial inventory of the key findings of the retrieved studies following the systematic search strategy, results were thematically mapped. The thematic analysis was performed in five phases: familiarization with the data, followed by searching for themes among the data, reviewing the themes, defining and naming the themes, and synthesizing the final results. Hence, a framework of four categories consisting of multiple elements that are fundamental to the establishment and success of SMTs was developed. Subsequently, the results of the included studies were synthesized according to the framework: (1) management and teamwork; (2) ICT and back-office support; (3) patient and employee satisfaction; (4) challenges to the implementation of SMTs (Monsen & deBlok, 2013; Narayan et al., 1996). The first two categories focussed on characteristics of SMTs. The third and fourth section focussed on outcomes of implementation and potential challenges. This approach of result synthesis provided the opportunity to gain broad insight into the existing evidence on SMTs in elderly care.

3.6 | Data abstraction

Prior to the data abstraction stage, a data charting table was created. Through the process of testing and refinement, the data charting table was developed (see Section 3.5). The two reviewers independently extracted data from the included studies following the variables of the data extraction table: author(s) and year; study type; type of intervention (if applicable); duration of intervention; study population; country of analysis; objective of the study; the concept (or care model) studied; methodology (statistical approach, hypotheses, method of analysis); outcome measures; results (ICT structure and back-office support, teamwork and management, patient and employee satisfaction, challenges); main findings on the potential of implementation of SMTs. After abstracting the key findings of the included studies, thematic mapping of the key findings was performed.

3.7 | Ethical considerations

Only findings of publicly available, published studies were used in this scoping review. No human subjects were involved. Therefore, ethical approval was not required for this study.

4 | RESULTS

4.1 | Study characteristics

Twenty-seven studies were included for analysis. Nine of these studies were conducted in or focussed on the Netherlands. One study

described the Buurtzorg Model in the Netherlands and related this to implementation in the United States. Six studies were conducted in England, four in Scotland and six in the United States. Furthermore, one study analysed the implementation of SMTs in Finland (Table 3).

The overall table of study results can be found in Appendix S1. Study types ranged from narrative reviews (12), to systematic literature reviews (3), case studies (11) and one quantitative cross-sectional study. The most frequently analysed care model was the Buurtzorg Model (12) (see Appendix S1). The Eden Alternative Model and the Eden Green House Model were both analysed once. These models provide elderly care in nursing homes with SMTs being responsible for all care, including meal preparation (Andersen et al., 2014; Zimmerman & Cohen, 2010). Two studies examined the Integrated Neighbourhood Care Aberdeen (INCA) Model which was created by the Scottish government in 2018 to integrate health and social care. Two studies analysed the Scottish Neighbourhood Care Model and four studies focussed on the UK Neighbourhood Nursing Model. Both care models were inspired by the Dutch Buurtzorg Model. Two studies analysed self-managing night homecare teams in the United States. These teams were already implemented before the existence of Buurtzorg Nederland. Finally, three studies did not specify a care model but analysed the concept of SMTs. Thus, included studies in this review focus on homecare as well as care in nursing homes. The following sections provide more insight into the results of the included studies.

4.2 | Teamwork and management

When aiming to transform a traditional elderly care team to an SMT, organization structures require extensive alterations. The implementation of SMTs requires a change in existing attitudes and beliefs on hierarchical management in a way that managers need to let go their control on the team (Narayan et al., 1996). Coaching through effective communication and cooperation were proposed as contributing factors to successful SMTs. Traditional hierarchies can be difficult to break down and a change to SMTs therefore requires a shift in management culture (Dean, 2015, 2018; Dobie et al., 2019). Hence, the introduction of SMTs must be supported by everyone in the organization (Jantunen et al., 2020).

The coach of the SMT was seen as an essential element of the new team structure by homecare nurses in the United Kingdom (Drennan et al., 2017; Drennan, Calestani, et al., 2018; Drennan, Ross, et al., 2018). Furthermore, the coach was considered as a 'buffer' between the SMT and the rest of the traditionally managed organization. The role of the coach was important for the successful implementation of SMTs to aid team decision-making and 'un-learning' the old mind-set of the nurses (Hamm & Glyn-Jones, 2019; Jantunen et al., 2020). Despite the importance of the supporting role of the coach, the team itself must remain responsible for its own performance (Yeatts & Seward, 2000). Leask and Gilmartin (2019) and Zimmerman and Cohen (2010) stressed that often teams need an explanation on how effective and efficient decisions through

consensus in an SMT can be taken. Nurses could need training to feel more comfortable when becoming self-managed, as they might think they are not capable of having the extra responsibilities that come with SMTs (Alders, 2015).

An SMT is comprised of eight different roles to be fulfilled by the nurses (Lumillo-Gutierrez & Salto, 2020). The roles of patient carer and team player must be fulfilled by all team members. Individual nurses are responsible for the other roles, being (1) planning the schedules; (2) checking the nursing records; (3) financial management; (4) checking the record of the teams' productivity; (5) a mentor maintaining a good team atmosphere and resolving minor conflicts; and (6) cooperating with municipalities for internal and external projects.

During the transformation to a flat hierarchy, old team dynamics may be a barrier to change to this new role division, which underlines the importance of changing the old way of thinking or establishing the SMT from scratch (Lalani et al., 2019). Nurses should meet their client's needs through a collaborative approach which is built on trust and which results in creative thinking and problem solving through team effort (Nandram & Koster, 2014; Tennant & Narayan, 1997). Combined with the requirement to perform new tasks, the skill mix of the staff is important (Zimmerman & Cohen, 2010). The autonomy and ownership of nurses is reflected in the nurses' task of checking for potential new colleagues who fit in the team dynamics. They introduce their new colleague and mentor them in the first period of time, which provides the opportunity to get to know each other and creates team bonding (Tennant & Narayan, 1997). This may lead to higher employee satisfaction.

4.3 | Patient and employee satisfaction

According to Jantunen et al. (2020), nurses in SMTs felt empowered as they could implement new ideas in the workplace, leading to decreased work stress and improved quality of care. The nurses could spend more time with patients and the responsibility to manage their own schedule resulted in a better work-life balance (Lalani et al., 2019). Hence, job satisfaction in SMTs was relatively high in case studies on the Dutch Buurtzorg Model (Maurits et al., 2017; Monsen & de Blok, 2018). However, some nurses left their team during a UK pilot study, which suggests that working in SMTs does not fit everyone (Dean, 2018).

Nurses felt to have a more rewarding role due to the higher continuity of care and the greater engagement with the patients which led to an increase in trust (Dean, 2015; Healthcare Improvement Scotland, 2019). Besides that, it was aimed to retain nurses by giving them salary increases and an extra end-of-the-year payment according to the number of years they have worked at the organization (Sprinks, 2014). The team cohesion and the increased time for frontline patient care, further contributed to the nurses' job satisfaction (Nandram & Koster, 2014; Tennant & Narayan, 1997).

The productivity of Buurtzorg nurses was higher compared with similar homecare organizations. Furthermore, nurse turnover was halved and sick leave and overhead costs were less than half

TABLE 3 Study characteristics

Author (year)	Study type	Outcome measures reviewed* (Appendix S1)	Care model and country	Research population#
Alders (2015)	Narrative review	1, 2, 3, 4	Buurtzorg model, the Netherlands	Homecare nurses
Dean (2015)	Narrative review	1, 3, 4	Buurtzorg model, the Netherlands	Homecare nurses
Dean (2018)	Narrative review	1, 3, 4	Buurtzorg model, London, England	Homecare nurses of the Lambeth and Southwark teams
Kreitzer et al. (2015)	Narrative review	1, 3, 4	Buurtzorg model, the Netherlands	Dutch homecare nurses
Monsen and de Blok (2018)	Narrative review	1, 2, 3	Buurtzorg model, the Netherlands	Dutch homecare nurses
Monsen and deBlok (2013)	Narrative review	1, 2, 3	Buurtzorg model, the Netherlands	Dutch homecare nurses
Sprinks (2014)	Narrative review	1, 2, 3, 4	Buurtzorg model, the Netherlands	Homecare nurses
Gray et al. (2015)	Narrative review	1, 3, 4	Buurtzorg model, the Netherlands and the USA	Buurtzorg CEO, NL & Minnesota USA staff, nurses, Dutch government officials, insurers, patient advocacy organization, competing homecare provider, primary care physician association, homecare trade association, principal investigator at KPMG
Hamm and Glyn-Jones (2019)	Narrative review	1, 4	Neighbourhood nursing model, London, England	Homecare nurses, 2 teams
Lumillo-Gutierrez and Salto (2020)	Narrative review	1, 2	Buurtzorg model, the Netherlands	Homecare nurses
Narayan et al. (1996)	Narrative review	1, 4	Self-managing night homecare teams, Virginia, the USA	Night homecare nurses
Tennant and Narayan (1997)	Narrative review	1, 2, 3, 4	Self-managing night homecare teams, Virginia, the USA	Night homecare nurses
Bishop (2014)	Narrative review	1, 3, 4	Self-managing teams, the USA	Nursing home nurses
Zimmerman and Cohen (2010)	Narrative review	1, 2, 4	Eden green house and similar models, the USA	Nursing home nurses
Andersen et al. (2014)	Scoping review	1, 4	Eden alternative model, the USA	Nursing home models and modes of service delivery
Yeatts and Seward (2000)	Case study literature review	1, 3	Self-managing teams, the USA	Nursing home registered nurses, director of nursing, supervisors
Dobie et al. (2019)	Case study	1, 2, 4	Neighbourhood care model, Coldstream, Scotland	Homecare nurses, 1 team
Jantunen et al. (2020)	Case study	1, 3, 4	Buurtzorg model, Finland	Homecare nurses, 7 teams
Drennan, Calestani, et al. (2018)	Mixed methods case study	1, 2, 3, 4	Neighbourhood nursing model, London, England	Patients, nurses, GPs, managers and conventional district nurses
Lalani et al. (2019)	Mixed methods case study	1, 3, 4	Buurtzorg model, London, England (homecare nurses, 1 team)	Homecare nurses, 1 team
Leask and Gilmartin (2019)	Qualitative case study	3, 4	Integrated Neighbourhood care, Aberdeen, Scotland	Homecare nurses, 2 teams
Leask et al. (2020)	Qualitative case study	4	Integrated Neighbourhood care, Aberdeen, Scotland	Homecare nurses, 2 teams
Nandram and Koster (2014)	Qualitative case study	1, 2, 3,	Buurtzorg model, the Netherlands	CEO, co-founders, staff, coaches, nurses, clients and a trainer

(Continues)

TABLE 3 (Continued)

Author (year)	Study type	Outcome measures reviewed* (Appendix S1)	Care model and country	Research population[#]
Healthcare Improvement Scotland (2019)	Qualitative case study	1, 2, 3, 4	Neighbourhood care model, Western isles; Highland; Aberdeen; Argyll and Bute; Clackmannanshire and Stirling; Scottish Borders, Scotland	Homecare nurses, 12 teams
Drennan et al. (2017)	Qualitative case study	1, 2, 3, 4	Neighbourhood nursing model, London, England	Homecare nurses, 2 teams
Drennan, Ross, et al. (2018)	Qualitative case study	1, 2, 3, 4	Neighbourhood nursing model, London, England	Patients and homecare nurses, 2 teams
Maurits et al. (2017)	Quantitative cross-sectional study	1, 3, 4	Self-managing teams, the Netherlands	Dutch nursing staff panel, 191 nurses

*Outcome measures reviewed: (1) teamwork and management; (2) ICT and back-office support; (3) patient and employee satisfaction; (4) implementation challenges.
[#]Number of teams indicated if specified within the study.

compared with other homecare organizations. Although the average hourly tariff is higher than in traditional organizations (€54.74; €48.74), the average annual time spent per client is lower (108 h; 168 h) (Alders, 2015). The hours of approved care spent by Buurtzorg nurses was 40%, compared with 70% by other organizations, respectively (Monsen & deBlok, 2013).

The provision of holistic and comprehensive care, following patient and family needs, is one of the main characteristics of SMTs (Kreitzer et al., 2015). Because most appointments are usually based on patients' needs and preferences, patient satisfaction has increased (Tennant & Narayan, 1997). The cooperation between nurse, patient and their family resulted in improved external support structures and optimized relationships between nurses and patients (Drennan, Calestani, et al., 2018; Kreitzer et al., 2015; Leask & Gilmartin, 2019). This was also stressed by GPs who noted improved communication and a more solution-oriented approach (Drennan, Calestani, et al., 2018). Nurses in SMTs were directly accessible and patients were able to negotiate their appointments (Drennan, Ross, et al., 2018). Furthermore, patients' independence improved due to the training they received from the nurses in managing chronic conditions (Gray et al., 2015; Healthcare Improvement Scotland, 2019). Within the Eden Alternative Greenhouse nursing homes, residents and staff reported similar positive results (Andersen et al., 2014). Patient outcomes and emotional well-being improved as satisfaction with the provided care was higher and in one Scottish case study increased to an average score of 98% (Leask & Gilmartin, 2019).

Continuity of care increased due to the small number of nurses involved with one patient and the joint decision-making, trusting relationships and mutual respect within the team (Healthcare Improvement Scotland, 2019). This led to better treatment adherence and greater knowledge on the possible treatment options (Drennan, Calestani, et al., 2018; Leask & Gilmartin, 2019). The engagement in team decision-making increased the team members' confidence, self-image and job retention (Yeatts & Seward, 2000). Moreover, the use

of the nurses' personal knowledge resulted in higher productivity (Bishop, 2014). In 2008, the Dutch Buurtzorg organization had the highest patient satisfaction rates in the Netherlands and in 2013 it scored high on the provided information regarding care, participation in care processes and quality of staff members (Alders, 2015).

4.4 | ICT and back-office support

In the studies analysing pilots of SMTs, the need for an ICT system was stressed. Back-office support for administrative tasks, which also enhances communication between teams and the organization, should be implemented from the start (Dobie et al., 2019; Drennan et al., 2017). It was found that the absence of ICT and back-office support creates difficulties in time management for nurses due to the obligation of reporting on patient records (Zimmerman & Cohen, 2010).

To reduce administration time and costs to third-party payers, Buurtzorg Nederland has developed its own technology infrastructure based on the Omaha System (Monsen & deBlok, 2013). Not only scheduling can be accessed via this system, but it is also used for educational purposes and to access electronic patient records. Expert groups take care of the education, focusing on specific skills and knowledge, such as the treatment of Parkinson's Disease. Nurses can share information and experiences via 'Buurtzorgweb' and can seek advice from coaches and colleagues. Besides this, they can view data on their team members' workload, the team's performance and patient satisfaction (Nandram & Koster, 2014).

The user friendliness of Buurtzorg's ICT structure was tested by homecare nurses and back-office employees and it was aimed to support the nurses' 'autonomy, networking, communication and documentation' (Monsen & de Blok, 2018). The use of this system resulted in a 30% reduction of administration time and saved approximately 20% of the administration costs (Lumillo-Gutierrez & Salto, 2020;

Monsen & de Blok, 2018). The necessity of live communication within teams was already stressed by the Visiting Nursing Association Night Nursing Team which used a 'Client Scheduling Report' listing the nurses' night schedule (Tennant & Narayan, 1997). Nurses were able to report to their team members through this early computerized patient record.

4.5 | Challenges for implementation

To prevent challenges during the creation of or transformation to an SMT, an introduction on SMTs seems key to understand what this working culture implies and how it practically functions (Leask et al., 2020). Absence of knowledge may harm the implementation process because essential elements, such as the flat hierarchy without formal management, may be disregarded or not fully implemented (Yeatts & Seward, 2000). This challenge was addressed in a Scottish pilot by providing 1 year of training on SMT principles before practical implementation (Healthcare Improvement Scotland, 2019). Although nurses' knowledge was well-developed, other challenges still arose such as a lack of support structures and integration of the system, as well as remaining bureaucracy and paperwork. Integrating care across care disciplines was also more challenging than anticipated (Dobie et al., 2019).

When transforming to an SMT, managers need to become coaches and thus give more responsibility to the nurses which might be challenging (Healthcare Improvement Scotland, 2019; Lalani et al., 2019; Narayan et al., 1996). The difficulty in overcoming traditional hierarchy and bureaucracy can harm the provision of holistic care (Sprinks, 2014). Furthermore, all team members must learn to cooperate and share responsibility for the outcomes, which may be difficult for nurses who are not used to this (Dean, 2018; Narayan et al., 1996). Hence, Bishop (2014) claims that it might be easier to implement SMTs in 'start-up settings' with workers who are new to the organization.

Having a flat hierarchy within the team means that nurses with different skills and qualifications are mixed. According to Lalani et al. (2019), the composition of SMTs with nurses having varying qualifications and experience was challenging. The organization must be willing to give responsibility and autonomy to the nurses regarding management tasks, such as taking care of the programme budget. Drennan et al. (2017) argued that the 'optimum mix of experience and skills' must be understood to create effective SMTs. Nurses have different skill levels, but are expected to perform the same tasks. Consequently, the flat hierarchy might result in little opportunity for career progression (Dean, 2018).

The practical implementation of a flat hierarchy created challenges regarding the performance of the traditional tasks of the manager, such as signing for supplies (Hamm & Glyn-Jones, 2019). Within Buurtzorg teams, this challenge was addressed by a nurse fulfilling the role of financial management (Lumillo-Gutierrez & Salto, 2020). Regarding the international implementation of SMTs, the local payment structure on homecare services can be a challenge as these

systems differ per country and thus need to be considered (Gray et al., 2015). Yeatts and Seward (2000) reported that collective decision-making following consensus can be difficult, which may harm the efficiency of SMTs. If consensus could not be reached, the administrator of one of the experiment groups rather set aside the matter instead of making a choice for the team. Hence, decision-making processes were slow and sometimes decisions were not taken at all.

5 | DISCUSSION

This scoping review aimed to map the existing evidence on the implementation and outcomes of SMTs in elderly care. Analysis of the 27 included studies has shown the potential of SMTs as a new style of nursing management.

Firstly, the type of nursing team to be transformed might influence the potential success of transformation. Within nursing homes, it might be more common to work in teams with more hierarchical relationships and traditional management styles, whereas homecare nurses who provide care at a patient's home mostly work alone anyways. Therefore, the transformation to a flat team hierarchy might be more problematic in nursing home teams compared with homecare teams. Other challenges for implementation, such as the change from a managerial to a coaching approach, require attention since the role of the coaches is crucial in the transition to SMTs. The coach offers support whenever possible and helps nurses in 'un-learning' the old way of thinking, which is required to create a supportive environment of trust and cooperation. Hence, it must be ensured that a coach can be approached from the start of the implementation or the team's transformation.

Secondly, the ICT systems were tested by nurses and other employees and resulted in less administration time and costs. It must be considered that this system, as well as the Buurtzorg teams, were created from scratch and therefore the reported outcomes in the literature on Buurtzorg might be better than the outcomes of teams that transform from a traditional structure. The supportive ICT system and back-office support contribute to nurses' time management and job satisfaction. Therefore, it is important to realize that the absence of such ICT system support might hamper a successful transition. Sufficient back-office support and a well-functioning ICT system must therefore be implemented to ensure that nurses have the most time to do what they do best: providing care (Zimmerman & Cohen, 2010). Besides a well-functioning ICT system, taking into account national culture and local context within the country of implementation seems essential. National payment structures within homecare differs between countries, which might limit the freedom of nurses to provide the necessary number of care hours. Whereas insurers pay for the delivered homecare on a flat per-hour rate in the Netherlands, clients in the United States often pay for the delivered care themselves, up to a certain limit (Berg, 2021; Gray et al., 2015).

Thirdly, although job satisfaction in SMTs was high, not every nurse might fit in such work environment (Dean, 2018). Homecare nurses in traditional organizations might be inexperienced in

cooperating with colleagues as much as is required in SMTs. Traditional homecare nurses often work independently in the patient's house, but it requires a shift in existing beliefs and manners to be able to work in an SMT. Nevertheless, increased nurse empowerment and improved relationships with patients result in high job satisfaction and quality of care. This seems to attract many nurses from traditional teams to SMTs and also seems to improve the retention of those nurses.

Patient's acceptance of SMTs was high (Leask & Gilmartin, 2019), and continuity of care has improved due to the joint decision-making, better treatment adherence and greater cooperation with family and other care disciplines (Dean, 2015; Drennan, Calestani, et al., 2018). Hence, the retrieved evidence suggests that SMTs contribute to the development of integrated care. The literature on the implementation and outcomes of SMTs has shown positive effects on integration of care, resulting from the small team working culture. SMTs aim to provide integrated care by joining the different required elements, such as a flat hierarchy, back-office support and ICT systems, small teams and a multidisciplinary, holistic perspective on care. This whole-systems approach of patient-centred care might provide a solution to the 'wicked' problem of health care provision in an ageing population (Kreitzer et al., 2015).

5.1 | Strengths and limitations

Most of the retrieved studies were qualitative or narrative studies which impeded a quantitative comparison of the studies. Although the scope of the found articles varied widely, the results were reported as structured as possible. The relative novelty of the literature on SMTs in homecare made it necessary to take this wide approach. Furthermore, due to the extensive interest in the Dutch Buurtzorg Model, this model of SMTs might be over reported compared with the other care models. If a systematic review is to be performed, quality appraisal of the retrieved studies should be performed.

International interest in the Dutch Buurtzorg Model is extensive and different countries such as Germany, Sweden and the United States have implemented the model or are in the process of implementation (Drennan, Calestani, et al., 2018). Although screening of the reference lists has resulted in valuable additions to the analysis of the literature, the systematic search strategy and screening did not yield any officially published studies concerning the implementation of SMTs in Germany or Sweden.

6 | CONCLUSION

When aiming to implement an SMT or transforming an existing elderly care team, timely and extensive preparation of this process is recommended. First, the care organization and nurses must receive training to increase their knowledge and enhance their vision on working in an SMT. Second, ICT and back-office support structures need to be in place timely to ensure that nurses can spend most of their time on providing care instead of dealing with administration. Furthermore,

coaches instead of managers must be present from the start of the team's work to support them in becoming an autonomous team and developing their own solutions for occurring problems. Finally, aligning with other local care providers, such as GPs, is recommended for the provision of holistic, multidisciplinary care which will eventually increase the continuity of care and treatment adherence.

Although SMTs have received much scholarly attention in the past decade, the number of pilot studies or experiments on the implementation of SMTs is limited. Moreover, controlled studies are largely absent hindering quantification of effectiveness. Gaining more insight into this will increase knowledge on successful implementation of SMTs. More studies focussing on nurse and patient satisfaction are required. This may lead to a higher retention of nurses and increase the much-needed future workforce in this sector.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

Implementing SMTs requires a change in management style, from managing to coaching nurses. By transforming the current team structure and vision of traditional hierarchical homecare organizations with top-down management to self-managing bottom-up teams with coaches, multiple aspects of the current problems of nurse retention and fragmentation of care can be addressed. This could increase nurses' autonomy and eventually contribute to higher job satisfaction and nurse retention.

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CONFLICTS OF INTEREST
No conflicts of interest has been declared by the author(s).

ETHICS STATEMENT
No ethical approval was required for this study.

DATA AVAILABILITY STATEMENT
Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

ORIGINAL ARTICLE

Organizational culture and readiness for evidence-based practice in the Kingdom of Saudi Arabia: A pre-experimental study

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Abstract

Aim: This study aims to establish postgraduate students' perceptions of the organizational culture and readiness for evidence-based practice of their workplaces in the Kingdom of Saudi Arabia.

Background: Nurse shortages and a reliance on a transient nurse workforce have long been a challenge in the Kingdom of Saudi Arabia. Developing a home-grown nurse workforce, a key objective of the Government of Saudi Arabia, can help to address this. Evidence-based practice offers a mechanism to address this. Evidence-based practice implementation is heavily reliant on the prevailing organizational culture. Establishing the organizational culture and readiness for evidence-based practice is crucial for sustainable evidence-based practice implementation.

Methods: A pre-experimental pilot study collected data from the same participants at three different points. As part of this, a questionnaire measuring organizational culture and readiness for evidence-based practice was administered twice. Descriptive, inferential and correlational statistics were employed to analyse the data.

Results: Results demonstrated improved participant perceptions of the organizational culture and readiness for evidence-based practice of their workplaces between the first ($M = 76.58$, $SD = 19.2$) and second ($M = 92.10$, $SD = 23.68$) data collection points, indicating moderate movement towards a culture of evidence-based practice. Strengths, challenges and opportunities for improvement were identified.

Conclusion: This study established participants' perceptions of the organizational culture and readiness for evidence-based practice of their workplaces, affording insight into context-specific strategies to embed evidence-based practice in health care organizations.

Implications for Nursing Management: Assessing an organization's culture and readiness for evidence-based practice (EBP) can afford insight on the strengths, challenges and opportunities that exist to equip nurse managers to advance evidence-based practice at individual, professional and organizational levels. This study demonstrated the importance of promoting an environment conducive to EBP and putting in place the necessary resources to support evidence-based practice implementation. Nurse managers can play a central role in this.

KEYWORDS

evidence-based practice, nurse leaders, nurse workforce, organizational culture and readiness for EBP, Saudi Arabia

1 | BACKGROUND

Nurse shortages have become a significant challenge for health-care systems worldwide, none more so than in the Kingdom of Saudi Arabia (KSA) (AL-Dossary, 2018; Aljohani, 2020; Almutairi et al., 2020; Alsufyani et al., 2020; World Health Organisation, 2020). It has been estimated that in the KSA, 40% to 60% of the nursing workforce are non-Saudi nationals (Alghamdi & Urden, 2016; Aljohani, 2020; Elmorshedy et al., 2020). Several factors contribute to nurse shortages in the KSA. These include a heavy reliance on a transient workforce, many of whom are expatriates from abroad (Aboshaiqah, 2016; Aljohani, 2020; Keshk et al., 2016), high turnover of staff, organizational environment and commitment, and cultural and language challenges (Al-Haroon & Al-Qahtani, 2019; Alluhidan et al., 2020; Alsufyani et al., 2020; Falatah & Conway, 2019). Social, religious and cultural factors that previously deterred people in the KSA from embarking on a nursing career have compounded the nurse shortage (Aboshaiqah, 2016; Alharbi et al., 2019; Keshk et al., 2016; Leufer et al., 2021). This all points to a need in the KSA to lessen dependence on non-Saudi nurses and to nurture, grow and support a critical mass of nurses from within the Kingdom.

The Government of Saudi Arabia (2016) set out its vision for the future of KSA in their Vision 2030 strategy with a dedicated focus on a number of areas including societal infrastructure, the Saudization of the workforce, enhancement of the health delivery systems and the nursing profession. With regard to the nursing profession and in an effort to address the nurse shortage in the KSA, the Government has undertaken to reduce reliance on non-Saudi nurses and to build and future-proof a home-grown nurse workforce. Increasing the home-grown nurse workforce affords many benefits, not least of which is the potential to enhance the patient experience, promote sustained evidence-based practice (EBP) implementation and high quality care delivery, and meet the ever-changing needs of an expanding health-care system within the Kingdom. Nurse education and EBP will play an integral role in the achievement of this vision. To this end, nurse education, both at under- and post-graduate level, has been restructured substantially in recent years with a minimum graduate entry level now at BSc, with MSc and PhD opportunities now more widely available (Aboshaiqah, 2016; Aljohani, 2020). This provides the

scope to build a cadre of nurses who are capable of fulfilling specialist and advanced nursing roles. These nurses will have the competence and capabilities to deliver EBP, collaborate effectively within the multi-disciplinary team, advocate for their patients and become the nurse leaders going forward. This, in turn, will raise the profile and appeal of nursing as a long-term career choice, sustaining the nursing profession within the KSA into the future. Integral to advancing the nursing profession and practice in this way is the inculcation of EBP knowledge and skills at all levels from the classroom to the bedside.

1.1 | Evidence-based practice

EBP is a patient-centred, holistic, problem-solving approach to health care, combining the best available evidence, clinicians' expertise and patients' values, to maximize patient outcomes (Cleary-Holdforth et al., 2021; Cleary-Holdforth & Leufer, 2009; Melnyk & Fineout-Overholt, 2019). EBP is a key mechanism to improving health-care quality, promoting optimal patient outcomes, reducing health-care cost and empowering health-care professionals (Cleary-Holdforth et al., 2021; Leufer et al., 2021). Despite its renowned benefits, EBP implementation remains inconsistent at best among health-care professionals.

Globally, EBP implementation is an enduring challenge and one that has not escaped the KSA (Abu-Baker et al., 2021; Alqahtani et al., 2020; Azmoude et al., 2017; Cleary-Holdforth et al., 2021; Heydari et al., 2014; Leufer, 2015; Leufer et al., 2021; Leufer & Cleary-Holdforth, 2007; Malik et al., 2015; Melnyk et al., 2016; Ubbink et al., 2013). Multiple factors, both individual and organizational, contribute to EBP implementation. On an individual level, a key determining factor of EBP implementation is the clinician's beliefs around EBP. Belief in EBP has been shown to correlate positively with implementation of EBP (Leufer et al., 2021; Melnyk et al., 2010; Milner et al., 2018; Ramis et al., 2019; Skela-Savič et al., 2016; Wallen et al., 2010). Universally, nurses consistently reported positive beliefs in EBP (Abu-Baker et al., 2021; Cleary-Holdforth et al., 2021; Cruz et al., 2016; Leufer et al., 2021; Milner et al., 2018; Singleton, 2017), yet variable EBP implementation levels persist. Nurses, however, also report low belief or confidence in their own ability to apply EBP in

practice, indicating inadequate EBP knowledge and skill, a frequently cited barrier to EBP implementation (Azmoude et al., 2017; Heydari et al., 2014; Melnyk et al., 2016; Saunders & Vehviläinen-Julkunen, 2016; Ubbink et al., 2013). From an organizational perspective, key barriers to EBP implementation include an organizational culture that is unsupportive of EBP and nursing leaders who are inadequately prepared for, resist, or do not advocate EBP (Caramanica & Spiva, 2018; Gallagher-Ford, 2014; Gerrish et al., 2012; Hauck et al., 2013; Li et al., 2018; Melnyk, 2016; Reichenpfader et al., 2015; Stetler et al., 2014; Timmins et al., 2012; Warren, Montgomery, et al., 2016; Williams et al., 2015).

1.2 | Organizational culture

Culture is 'the beliefs, behaviours and values of people within an organization' and is often 'the prevailing factor that determines whether an organization will be successful at achieving its vision and strategic goals' (Melnyk, 2016, p. 99). In the context of EBP, therefore, culture can similarly influence the success or otherwise of EBP implementation. Key to the success of EBP implementation, therefore, is the inclusion of EBP in the organization's vision and goals. Workplace culture, lack of support from management and other staff, lack of resources, lack of authority/autonomy to effect change, and workload are the five main organizational barriers to EBP (Dalheim et al., 2012; Labrague et al., 2019; Melnyk & Fineout-Overholt, 2019; Melnyk et al., 2016; Shifaza et al., 2014; Williams et al., 2015). If present and unchallenged in an organization, these factors will continue to perpetuate low EBP implementation. Some organizations will be more open to and embracing of change than others, and all have the potential to shape the clinician's experience and practice, and patient outcomes either positively or negatively (Gerrish et al., 2012; Melnyk & Fineout-Overholt, 2019; Melnyk et al., 2017; Warren, McLaughlin, et al., 2016; Williams et al., 2015; Williams et al., 2017).

1.3 | Leadership

The critical role of the nurse leader in the successful integration of EBP in an organization cannot be underestimated (Caramanica & Spiva, 2018; Gallagher-Ford, 2014; Hauck et al., 2013; Reichenpfader et al., 2015; Stetler et al., 2014). EBP-supportive leaders have been shown to adopt behaviours that engender EBP implementation (Caramanica & Spiva, 2018; Li et al., 2018; Ost et al., 2020; Stetler et al., 2014). These behaviours include providing hands-on support in the performance of EBP activities, role-modelling EBP and nurturing EBP champions, educating staff, facilitating EBP performance reviews, and introducing EBP language into policies, conversations and the business of the organization. Leaders with the motivation and capacity to ring-fence necessary resources for EBP implementation inspire, encourage and support their staff to develop the necessary EBP knowledge and skills. They provide the landscape necessary to enable their staff to feel competent and confident to deliver patient care that

is evidence based. These leaders are integral to successful, sustainable EBP implementation. The process of developing these leaders and future champions of EBP should begin within nurse education programmes. With this in mind and in keeping with the goals of Vision 2030, two universities, one in Ireland and one in the KSA, developed an MSc in Nursing: Advanced Practice programme for delivery in the KSA university.

1.4 | MSc in nursing: Advanced practice

The MSc in Nursing: Advanced Practice programme goals included the development of a critical mass of Saudi nurses capable of fulfilling specialist and advanced roles in nursing, typically occupied by transient expatriate nurses. In an effort to help achieve this aim, a tailored intensive EBP module was included in the programme. The module set out to provide students with knowledge and understanding of the core components of EBP including the requisite skills necessary to implement the steps of the EBP process in practice, an approach mirroring that adopted by Leufer (2020). The module was formally evaluated over an 18-month period using a pre-experimental pilot study method. The study set out to determine a context-specific baseline of student's knowledge, beliefs and implementation of EBP as previously reported by Leufer et al. (2021). In addition, the organizational culture and readiness for EBP was measured, and this paper reports the findings of this component of the study.

2 | METHODS

2.1 | Design

As part of a pre-experimental pilot study (Leufer et al., 2021) that sought to ascertain the EBP knowledge, beliefs and implementation of postgraduate students on an MSc in Nursing: Advanced Practice programme in KSA, students were also asked to respond to a questionnaire that examined the Organizational Culture and Readiness for EBP of their workplaces.

2.2 | Data collection

Data collection was undertaken over an 18-month period at three different points involving the same participants. Data were collected as follows:

- Time 0 – during the first semester of the MSc programme immediately prior to embarking on a dedicated EBP module;
- Time 1 – 3 months following completion of the EBP module; and
- Time 2 – 12 months after Time 1.

Data pertaining to Organizational Culture and Readiness for EBP were collected on the second and third data collection points only.

Following an introductory email that explained the study and invited students to participate, a link to an anonymous electronic survey was circulated. Data were paired across the collection points. Pairing was facilitated by students self-selecting a unique identification number known only to them from a pool of identification numbers, in advance of distribution of the survey link. Students were required to enter their unique number at both data collection points.

2.3 | Participants

The participants comprised post-graduate nursing students undertaking the EBP module on the inaugural MSc in Nursing: Advanced Practice programme in one university in the KSA. There were no additional eligibility criteria. Fifty-one students comprised the sampling frame. Convenience sampling was used to recruit participants at both data collection points.

2.4 | Instrument

Organizational Culture and Readiness for EBP was measured using the Organizational Culture and Readiness for System-wide Integration of EBP Survey (OCRSIEP©, Fineout-Overholt & Melnyk, 2005). This survey measures organizational cultural factors that influence the implementation of EBP and participants' perceptions of the state of preparedness of their organization for EBP, as well as how it compares to 6 months prior as an indicator of readiness for advancing culture toward EBP. It contains 25 items and uses a 5-point Likert scale (1 = 'none at all', 5 = 'very much') that determines the support in the organization's culture for EBP, which helps to pinpoint the potential facilitators and opportunities for system-wide EBP integration. Items on this scale include, 'In your organization, to what extent is there a critical mass of faculty who have strong EBP knowledge and skills?', 'To what extent are there Advanced Nurse Practitioners who are EBP mentors for staff nurses as well as other ANPs?', and 'To what extent do you believe that EBP is practiced in your organisation?' Possible total scores range from 1 to 125 with higher scores reflecting greater organizational readiness for EBP. The OCRSIEP Survey© has performed consistently with internal consistency reliabilities using Cronbach's alpha in excess of .85 in previous global studies (Cleary-Holdforth, 2020; Melnyk et al., 2010; Melnyk & Fineout-Overholt, 2015; Wallen et al., 2010). Cronbach's alpha was similarly used in this study to measure the OCRSIEP scale's reliability as it has demonstrated consistent, reliable results across settings, time and sample sizes globally with respect to this scale. This has been demonstrated most recently by one of the scale authors who, in an examination of the psychometric properties of the OCRSIEP scale, obtained data from 2344 nurses from 19 hospitals and health-care systems internationally. The scale achieved a Cronbach's alpha of .96 for all items. This indicates outstanding internal consistency of the OCRSIEP scale, demonstrating that this scale is a valid and reliable measure of EBP culture and readiness in hospitals and health-care systems (Melnyk et al., 2022), providing further confidence in its use.

2.5 | Data analysis

The computer software programme IBM® SPSS was used to manage and analyze the data. The level of significance for the study was set at .05. Total scores were generated for the OCRSIEP scale. Demographic data (age and number of years qualified) were examined using descriptive statistics. Between-groups differences across the data collection points were explored using paired samples t tests. The distribution of all variables was normal and the data met all assumptions of the analyses used.

2.6 | Ethical considerations

Ethics approval was obtained from the relevant Research Ethics Committees (Dublin City University Research Ethics Committee Reference Number: DCUREC/2018/171 and Princess Nourah Bint Abdulrahman University Institutional Review Board Log Number: 18–0245) as previously reported (Leufer et al., 2021).

3 | RESULTS

3.1 | Demographics

Fifty-one nursing students undertook the post-graduate EBP module in question. Twenty-seven students (53%) completed 'Time 1' and 15 (29%) completed Time 2'. All participants were female, ranging in age from 18 to 41 years. Forty three percent of the participants were aged between 24 and 29 years, with a further 43% between 30 and 35 years. No differences were detected on the OCRSIEP scale scores between the age groups. Forty-two were based in acute care hospital settings, three in out-patient clinics, two in community health-care settings and two in nurse education roles. Forty one percent were qualified as nurses between 1 and 5 years, whereas 43% were qualified between 6 and 10 years and a further 16% were qualified between 11 and 15 years. The number of years qualified did not influence the OCRSIEP scale scores. The OCRSIEP© scale was found to be highly reliable at both data collection points of this study, with Cronbach's alphas of .95 and .97, respectively.

3.2 | Organizational culture and readiness for system-wide integration of EBP survey©

3.2.1 | Time 1

The OCRSIEP survey was administered for the first time in this study at Time 1. The mean score reported at Time 1 was 76.58 (SD19.2). This score demonstrates moderate movement toward a culture of EBP but that culture is not currently sustainable (Fineout-Overholt, 2017). Mean scores of 4 or above were not reported on any item, indicating that the participants did not perceive any strengths within the organization to support EBP implementation at Time

1. Approximately 50% of items had reported means between 3.04 and 3.72 placing them in the mid-point of the scale ('somewhat') and identifying them as opportunities. The remaining items had reported means ranging from 2.64 to 2.93 placing them at the lower end of the scale ('a little') representing challenges that require intervention. Table 1 displays a summary of the main strengths, opportunities and challenges reported at both Time 1 and Time 2. In relation to the scale item concerning the movement of the organization toward an EBP culture, 8% reported 'none at all', 28% reported 'a little', 13% reported 'somewhat', 10% reported 'moderate' and 5% reported 'very much' movement toward a culture of EBP.

3.2.2 | Time 2

The mean score reported on the OCRSIEP survey at Time 2 was 92.10 (SD 23.68) representing a substantial increase from Time

TABLE 1 Organizational culture and readiness for EBP survey

Time 1 results	Time 2 results
Strengths:	**Strengths:**
No strengths reported.	• EBP practised in the organization. • More staff nurses skilled in EBP, including computer skills • Fiscal resources • Greater collaborative decision-making around EBP
Opportunities:	**Opportunities:**
The extent to which: • EBP is central to the philosophy • participants believe that EBP is practised in the organization • there is commitment to EBP at various levels • there is fiscal support and decision-making at various levels	• The extent to which EBP is central to the mission and philosophy of the organization • The presence of EBP champions at various levels • Advanced Nurse Practitioner's who are EBP mentors • a critical mass of nurses with strong EBP knowledge and skills
Challenges:	**Challenges:**
Insufficient numbers of: • doctorally prepared nurses • EBP mentors • EBP role models • Librarians with EBP knowledge and skills and the extent to which they are used • EBP champions among: ◦ Administrators ◦ Physicians ◦ Nurse educators ◦ Advanced nurse practitioners ◦ Staff nurses • Inadequate measurement and sharing of outcomes.	• The extent to which clinicians model EBP in their clinical settings.

Note: EBP, evidence-based practice.

1 (76.58) and one approaching statistical significance ($p = .053$) upon analysis using paired-samples student t tests. This score (92.10) also indicates moderate movement toward a culture of EBP (Fineout-Overholt, 2017), which was a reassuring finding. In contrast to Time 1 findings, a number of items had reported mean scores above 4 signifying that participants perceived these as areas of strength. These areas are listed in Table 1. It is worth noting that these were all areas that had scored less than 3 at the previous point of data collection, identifying them as challenges to EBP implementation at that time. In contrast to Time 1, no item scored less than 3 on this occasion. In relation to the item concerning the movement of the organization toward an EBP culture, 13% reported 'a little', 40% reported 'moderate' and a further 13% reported 'very much' movement toward a culture of EBP. This represents a positive shift in participants' perception of their organizations' movement toward a culture of EBP. Fifty three percent of the participants in Time 2 reported a moderate or greater organizational movement toward EBP culture compared to 15% at Time 1.

4 | DISCUSSION

Williams et al. (2017) demonstrated that organizational culture and clinicians' intentions play an integral part in EBP implementation. Therefore, when assessing clinicians' EBP beliefs and implementation, the culture and context of the environment in which they practice should also be assessed. This provided the impetus to ascertain the organizational culture and readiness for EBP from the cohort of focus alongside measuring their EBP beliefs, and EBP implementation, which were previously reported by Leufer et al. (2021). The implications of the organizational culture and readiness findings will be discussed here.

Data pertaining to organizational culture and readiness for EBP were collected on two occasions, 3 months following completion of the EBP module (Time 1) and again 12 months later (Time 2) when students had completed two extended clinical practice placements. This afforded students the benefit of the EBP knowledge and skills learned in the module, following which they had good opportunity to use it in clinical practice. In addition, at Time 2 they had been immersed in the organizational culture of their workplaces for a considerable period, as a result of which they were arguably well placed to have an informed perspective on their organizations' culture and readiness for EBP. The mean score reported at Time 1 was 76.58 and at Time 2 was 92.12, representing substantial improvement in the organizational culture and readiness for EBP, with increased scores across all 25 scale items. It is noteworthy that, while no strengths were reported at Time 1, this had greatly improved at Time 2 (see Table 1). The participants age or number of years qualified did not yield any differences in their reported OCRSIEP© scores. In tandem with students' perception of improved organizational culture and readiness for EBP, over the course of the study, students' EBP beliefs and EBP implementation also improved and were sustained at Time 2 (Leufer et al., 2021). This suggests a relationship between these variables and reflects the findings of other similar studies (Breckenridge-

Sproat et al., 2015; Cleary-Holdforth, 2020; Gorsuch et al., 2020; Melender et al., 2020; Melnyk et al., 2017; Milner et al., 2018; Williams et al., 2015; Yoo et al., 2019). Findings demonstrated widespread opportunities for intervention, highlighting context-specific areas that can be targeted and improved, and offering insight into strategies that can be recommended.

4.1 | Recommendations for practice

This assessment of organizational culture and readiness for EBP has assisted in identifying some of the context-specific facilitators of and barriers to EBP implementation. As such, it may provide the key to understanding the EBP beliefs and implementation of the clinicians who practice there. More importantly, this assessment affords the opportunity to identify and plan the way forward, overcoming the barriers and capitalizing on the facilitators, to cultivate a culture and environment in which EBP can flourish and become the standard approach to patient care. To this end, strategies should focus on embedding EBP in the business and culture of the organization, and nurturing current and future EBP leaders. Strategies could include actively articulating EBP within the organization's wider philosophy and mission statement; crafting job descriptions and appraisals in which EBP is an expectation; identifying the needs of managers in relation to EBP knowledge and skills; ring-fencing personnel, time and resources to facilitate education, training and mentoring in EBP; and working with staff providing encouragement and hands-on support with EBP activities (Hauck et al., 2013; Melnyk et al., 2016; Orta et al., 2016; Milner et al., 2018; Fineout-Overholt et al., 2019). The merits of such investment in strategies to advance EBP cannot be underestimated and, as research has demonstrated repeatedly, has the potential to yield substantial benefits for patients, health-care professionals and health-care organizations alike.

5 | LIMITATIONS

This study was part of a pre-experimental pilot study undertaken as a precursor to a larger study in the same jurisdiction that is currently in planning. A single site, convenience sampling and a small sample size were used, all of which can affect the generalizability of the results. There was some attrition between the first and second data collection points, which may have been, in part, a consequence of competing assessment demands on the students at that time. Although attrition is not uncommon in longitudinal studies, it can, nevertheless, impact the validity and generalizability of the results.

6 | CONCLUSION

In the KSA, the Vision 2030 strategy aspires to improve health-care quality and delivery within the Kingdom. A further goal within this is to address the shortage in the nurse workforce and generate a home-grown cadre of Saudi nurses who can assume leadership roles, promote continuity of quality patient care and advance nursing practice. EBP has been demonstrated to act as a catalyst in the achievement of such goals, promoting optimal patient outcomes, standardizing care, empowering staff, enhancing staff morale and retention, producing higher job satisfaction and yielding cost savings in health-care delivery. However, EBP implementation continues to be a universal challenge and there are multiple, complex contributing factors to this. Integral to successful, sustainable EBP implementation is a supportive organizational culture that is embracing of EBP. Ascertaining an organization's culture and readiness for EBP is an essential starting point that needs to be determined if an organization is to realize the widely acknowledged benefits that EBP can offer. This study established the organizational culture and readiness for EBP of the workplaces of a group of postgraduate nursing students in the KSA. In so doing, it has identified strengths, opportunities and challenges to EBP implementation within these organizations. Armed with this knowledge, it is possible to plan and implement context-specific strategies aimed at embedding EBP in the business and practice of these health-care organizations.

6.1 | Implications for nursing management

EBP implementation in nursing is a universal challenge. This is no different in the KSA. Nurse managers globally have the potential and influence to champion EBP implementation among their staff. This study explored the organizational culture and readiness of the workplaces of a cohort of students undertaking an inaugural MSc in Nursing: Advanced Practice programme in the KSA, where such a study had not previously been conducted. In so doing, it has, for the first time, provided a unique and bespoke insight into the context-specific strengths, opportunities and challenges to EBP implementation using the OCRSIEP scale in these organizations in this jurisdiction. It also further highlighted the importance of promoting an environment conducive to EBP and putting in place the necessary resources to support EBP implementation in a tailored, context-specific manner. Nurse managers can and should play a central role in this, acting as both EBP role models and sources of EBP knowledge and competence, as well as determining how the identified organizational strengths, opportunities and challenges can be addressed in order to advance their organizations' readiness for EBP (Caramanica & Spiva, 2018; Gallagher-Ford, 2014; Gerrish et al., 2012; Hauck et al., 2013; Schaefer & Welton, 2018). Pragmatically, they can actively seek resources for their staff that promote EBP, including time to undertake EBP activities in practice, relevant EBP training, and the nurturing and provision of EBP mentors, for example. However, this all hinges on their possession of sound EBP knowledge and skills, which may be variable among nurse managers currently. To this end, EBP programmes targeting this group to

ensure that they are prepared and ready for this responsibility are imperative and would potentially yield far-reaching results (Melnyk & Fineout-Overholt, 2019; Shuman et al., 2019).

CONFLICT OF INTEREST
None.

ETHICAL CONSIDERATIONS

Ethics approval was obtained from the relevant Research Ethics Committees (Dublin City University Research Ethics Committee Reference Number: DCUREC/2018/171 and Princess Nourah Bint Abdulrahman University Institutional Review Board Log Number: 18-0245) as previously reported (Leufer et al., 2021).

DATA AVAILABILITY STATEMENT
Research data are not shared.

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ORIGINAL ARTICLE

WILEY

The grounded theory of Coalescence of Perceptions, Practice and Power: An understanding of governance in midwifery practice

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Abstract

Aims: This study aimed to understand midwifery care during labour, particularly decision-making processes, within Australian health systems.

Background: Midwifery, founded on a wellness model of motherhood, is at risk of being medicalized. Whilst medical intervention is lifesaving, it requires judicious use. Governance provides oversight to care. Exploring decision-making contributes to understanding governance of practices.

Method: Straussian grounded theory using semi-structured interviews. Eighteen Australian registered midwives were interviewed about their practice when caring for women during labour.

Results: Midwives were caught between divergent positions; birth as natural versus birth as risk. Experienced midwives discussed focussing on the woman, yet less experienced were preoccupied with mandatory protocols like early warning tools. Practice was governed by midwives approach within context of labour. The final theory: The Coalescence of Perceptions, Practice and Power, comprising three categories: perceptions and behaviour, shifting practice and power within practice, emerged.

Conclusions: Coalescence Theory elucidates how professional decision making by midwives during care provision is subject to power within practice, thereby governed by tensions, competing priorities and organizational mandates.

Implications for Midwifery Managers: Midwifery managers are well positioned to negotiate the nuanced space that envelopes birthing processes, namely, expert knowledge, policy mandates and staffing capability and resources, for effective collaborative governance. In this way, managers sustain good governance.

KEYWORDS
early warning tool, governance, intrapartum, midwifery or midwife, midwifery practice, risk aversion

1 | INTRODUCTION

The relationship between midwifery and improved perinatal outcomes is well established, leading to calls for increased access to midwifery care (United Nations Population Fund, 2021) (Tracy et al., 2013). The World Health Organization has identified that midwifery practice remains underutilized, and full scope of practice is limited (World Health Organization, 2016). For health systems to strengthen midwifery it is essential to identify how the systems themselves may enhance or impede midwifery practice (Renfrew et al., 2014).

Contemporary midwifery practice intersects at two disparate approaches, confidence in spontaneous birth versus birth as risk (Scamell, 2016) and the dominance of obstetrics and managerialization over midwifery knowledge and autonomy (Zolkefli et al., 2020). The need to control and mitigate risk has resulted in the standardization of care; in opposition to woman-centred, individualization of care (Prosen, 2022). Understandably, the need to control emerges from fear of the unknown (birth) and the risk this poses to women, infants, institutions and professionals.

This paper reports on a study that sought to better understand midwives' care, specifically decision-making processes, when providing care for labouring women. The theory generated from this research posits factors, behaviours and practice germane to governance.

2 | BACKGROUND

Governance refers to 'A framework through which health service organisations are accountable for continually improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in care will flourish' (Healthcare Commission, 1998). Governance encompasses the system by which an institution is controlled and operates, and the mechanisms by which it and its people are held to account. Ethics, risk management, compliance and administration are all elements of governance (Governance Institute of Australia, 2022). Governance seeks to combine organizational, managerial and clinical approaches that enhance quality of care via development of processes that facilitate or safeguard good care and enable improvement (Arulkumaran, 2010). Therefore, governance differs from statute-driven regulation. Governance accommodates the breadth of people, tools, stakeholders, and practice. In a midwifery context, clinical governance comprises interwoven components, such as the woman, the midwives, the environment, organizational policies and procedures and the leadership team.

A central concern in governance is risk. The nature of risk, including how it is characterized, defined, perceived and managed is specific to circumstances. These circumstances inform risk tolerance and the establishment and management of processes. However, it is imperative that the public trust in the quality of maternity services.

In Australia, the safety and quality commission stipulate the standards of all aspects of health care provision. In the midwifery context, reports such as Confidential Enquiries into Maternal Deaths in the United Kingdom (UK) (Carle et al., 2013) and standard statements such as the Australian Commission on Safety and Quality in Health Care (ACSQHC) advocate for early warning tools and protocols to mitigate risk and assure good governance (ACSQHC, 2017). Accordingly, current institutional policies encourage or even mandate midwives' use of an EWT in all birthing scenarios.

3 | STUDY DESIGN

This study adopted a hybrid grounded theory methodology as conceived by Strauss and Corbin (1990) and advanced by Adele Clarke's Situational Analysis (2003). Grounded theory, a qualitative methodology, using humanistic methods to discern people's experiences and to understand them was deemed fitting (Denzin & Lincoln, 2018; Glaser & Strauss, 1967).

4 | SAMPLE/PARTICIPANTS

A purposive sample of currently employed Australian registered midwives providing intrapartum care were invited to participate. The sample was identified and located via the Australian College of Midwives membership newsletter, LinkedIn, and Facebook online recruitment. A total of 18 midwives consented to participation. These midwives had varying levels of experiences from 1 year post graduation to 40 years as a practising midwife. They worked in a range of maternity contexts and models of care; some midwife led and some not. All participants were allocated a pseudonym for the transcriptions and reporting of findings.

5 | DATA COLLECTION

Individual, semi structured interviews were conducted with all 18 participants. The interviews were conducted in a private office by the lead author (BF) a registered midwife undertaking a PhD and the private residences of participants via Zoom videoconferencing. Interviews were 40 to 60 min long and were recorded then transcribed verbatim using N-Vivo. Field notes and memos were made during and after each interview.

6 | ETHICAL CONSIDERATIONS

Ethics approval was received from the relevant institutional Human Research Ethics Committee (HREC) prior to the study commencing. Midwives were provided with an information sheet and consent form prior to participation.

7 | DATA ANALYSIS

Data analysis was conducted according to the tenets of Straussian grounded theory, namely, methods of coding, constant comparative

analysis, theoretical sampling and memoing (Strauss & Corbin, 1990). Data analysis was expanded via situational analysis (Clarke, 2005), highlighting social action/interaction and mechanisms of power within midwives' professional setting. Data coding was undertaken by two authors (BF and AB). Themes were derived from the data. Theoretical saturation and generation of themes was discussed with all supervisors.

8 | RESULTS

From analysis of the findings the theory of Coalescence of Perceptions, Practice and Power, emerged. Three themes were central to this theory 'Perceptions and behaviours', 'Shifting practice' and 'Power within practice' and are discussed in detail below.

8.1 | Perceptions and behaviours

Midwifery practice is based on a wellness model with the woman at the centre of care, based on an understanding that pregnancy and birth are a normal, healthy state of being rather than an illness. Whilst experienced midwives discussed a focus on the woman, those less experienced were preoccupied with designated protocols and procedures during labour. Two sub-categories illustrated these disparate positions: Behaviours guided by woman centred care and behaviours guided by protocols.

8.1.1 | Behaviours guided by woman centred care

Experienced midwives spoke of their expert knowledge and their midwifery skills to provide woman centred care and support spontaneous birth. Primarily these participants spoke of implementing midwifery 'knowingness' and skills of looking, feeling, listening to maternal cues, physical, behavioural and verbal to assess the labour. They explained that listening to women is important because women often know when something is wrong, and this can be a significant indicator for the midwife before external signs become apparent. Listening with purpose to how the woman vocalizes, her changes in tone and the types of sounds she makes alerts them to the stages of labour and therefore progress. Participants spoke of supporting the woman to spontaneously labour in response to her body's own physiology during home birth.

> **Pam**: *Listening is a very good tool, listening to the different sounds she's making, it's watching and listening to those changes. That's about progression in labour as opposed to Early Warning Tool observations.*

They explained that this midwifery approach promoted a woman's self-efficacy, to know she can and will birth her baby, as well as fostering her burgeoning self-belief, and confidence that crystallized into self-empowerment.

The participants regarded the ability to look, listen and feel for the inherent rhythm of natural labour, and to be guided by this, the woman's own body, including how she moved and positioned herself as paramount.

> **Julie**: *We were quietly listening, and we picked up that her breathing was getting a whole lot heavier and yes, she was fully dilated and just letting us know this through her vocalisations, but you must be with someone and uninterrupted for that time.*

8.1.2 | Behaviours guided by protocols

Some midwives specifically discussed the benefit of mandated protocols, such as Early Warning Tools (EWT), in directing how they provided care for women in labour. These participants discussed the assistance the tools and accompanying escalation provided in prompting assessments, timely communication and advising on actions. This was especially helpful and appreciated when midwives were less experienced or became overwhelmed. However, protocols were found to be time consuming due to compliance with frequency of routine observations and associated documentation. This served to reduce 'being with woman' and *Jane* shared how she became focused on doing 'obs' [observations] because she did not have sufficient time to sit with women.

> **Jane**: *There's not that ability to sit with the woman and palp for ten minutes because that ten minutes is literally when you've got another set of Obs due again and your back at the start.*

However, junior midwives highlighted the confidence that completing the EWTs provides as it justifies their course of action and sharing of responsibility. Jane also shared:

> **Jane**: *It gives you confidence and validation in communicating to medical staff. It's got more guts behind it, especially when you're junior and escalating. You're covering your bum and they're aware that if something happens later, you will say I told you so!*

Several participants discussed the role of EWTs as a form of validation that provided objective data upon which to base escalation of care, rather than subjective assessments related to the midwife 'knowing' the woman, and the woman 'knowing' her body.

> **Rosemary**: *The EWT is useful when you are not feeling heard because doctors will listen to the EWT.*
>
> **Andrea**: *The EWT protocol dictates that I must tell doctors about it, and they must review. It's a great help.*

However, introduction of computerized early warning systems to reduce errors was seen as both a benefit and a limitation. Rosemary found flaws within the computerized tool and suggested it was not foolproof, triggering unnecessary observation.

> With the electronic system, if you do not do the entire EWT, it will not tell you what the score is. It will just tell you that you have not put enough data in, so it does not work unless you are putting it all in at the exact same time even if it's not due.

8.2 | Shifting practice

The second theme, Shifting Practice, describes the juxtapositions of 'birth as normal' and 'birth as risky'. These juxtapositions were significant in midwives' behaviours when prioritizing care for the woman. Some midwives spoke about how they managed to create synergies, for example, Parvin explained 'working around'

> **Parvin**: Midwives tailor their care to the woman individually to a degree. We're still told we've got to do these observations in the mandated timeframe, but there are ways around it, like choosing when to take the obs and who to escalate to.

Others accepted their utility, for example,

> **Brooke**: We are mitigating for the youngest midwife so it's the same for each birth, every time, for each midwife. That's being consistent and the consistency is about safety.

However, for other midwives their practice was challenged when these elements competed, rather than synchronized. Somewhat surprisingly, the perceptions of midwives' use of EWTs were consistent in their voiced concern about losing the individuality of each midwife-woman relationship, although there were differences in how seriously they perceived the impact; this was associated with their willingness to comply with institutional mandates. Adherence to policy could result in care focused on technological and procedural components. The sub-themes that make up the theme of Shifting Practice are Compliance and Defiance, that emerged through the midwives' discussions around the choice between their professional survival (compliance) and their midwifery philosophy (defiance).

8.2.1 | Compliance

Midwives discussed an imperative to comply. Reasons included being 'blamed' when things went wrong because protocols had not been followed and this had consequences. Care and decision making that were considered outside of, or contrary to, policies were subject to documentation in risk management systems. Hospital cultures were organized to reduce adverse outcomes therefore recorded incidents were carefully reviewed. Most participants voiced an understanding of the significant impact that not following protocols could have on individual midwife's autonomy. *Pam* shared non-compliance could 'destroy you':

> **Pam**: The power and the system puts midwives in a position where you have got to choose between yourself and the woman because if this goes badly, you'll be absolutely destroyed.

Brooke flagged the importance of knowing 'the boundary line' to remain compliant.

> **Brooke**: My registration is on the line and the hospital policies are telling me what to do. It is a line in the sand, and for the sake of your registration, you must come to the line.

Adherence to policy was viewed as self-preservation. Consequences for non-compliance included being blamed for adverse outcomes and being seen as a rogue whose practice was untrustworthy. Further to this were concerns regarding loss of employment and litigation. This was shared by *Pam*:

> **Pam**: The CEO mandated that if we don't escalate, our job is on the line, so that put fear in people.

Conditions of employment left midwives with a choice to comply for professional protection versus using their midwifery knowledge in defiance. In this way midwifery autonomy was constrained and compliance with policy enforced.

8.2.2 | Defiance

Defiance manifested in the attempt to provide care consistent with midwives' stated ideals. The outcome of defiance was visible in midwives entering private practice and homebirth, to draw on tools that better fitted with their model of care. Midwives spoke of using their 'soft' midwifery skills. They felt drawing on their midwifery radar or intuition was enhanced when they were not interrupted by mandated, regimented assessment taking and documentation. *Anastasia* discussed the importance of recording to demonstrate her safe practice, whilst *Millicent* highlighted the 'alarms' were different in the home birth context.

> **Anastasia**: We cannot go away from observation charts, and as a home birth midwife, I use an old Partogram. I write on my Partogram the labour progress so that if I'm audited, I can show that I'm safe.

Millicent: At home it's an alert, not an alarmed scenario. You don't have a boss on the alert for you, because at home it's not an alarm situation.

Midwives who wanted to maintain woman focused care within hospital settings sought to make conscious decisions about reporting. These participants spoke of being selective to whom they would escalate and where possible would seek out likeminded and respectful professionals for consultation. Defiance was more probable when the midwives could liaise or seek out the assistance of likeminded colleagues.

8.3 | Power within practice

Midwives were mixed in their considerations of the value of tools and accompanying processes that directed their practice. The final theme of Power within Practice describes the contestations governing midwifery practice that seek to minimize risk and strive for consistency, to improve quality of care. Sub-themes of accountability and autonomy exercised the elements of power within the context of practice. How these played out in relation to perceptions, behaviours, shifting practice and resources resulted in the operation of governance.

8.3.1 | Accountability of care provision

For the majority of participants 'accountability' was achieved through completion of record keeping and escalation. Objective evidence assisted in demonstrating completion of their work, that is, their practice was transparent. Accountability also includes reducing the misuse of resources. Requesting a Met call without consideration of appropriate staffing can inadvertently reduce safety. Removing specialist resources from more appropriate areas whilst failing to respond with the correct team places both the women and other patients at risk. EWT escalation routinely results in a MET call and although midwives felt a sense of relief, it was important that the appropriate team responded. In some instances, the wrong team responded.

Scarlet: We've tried to find our clogs in the EWT and it's that there is not a specific call for the obstetricians. The MET Call brings the whole hospital but no obstetrician. Obstetricians don't automatically get called.

Participants were concerned that prioritizing the 'safety option', detailed adherence to form filling contributed to the medicalization of birth. This altered the role of midwives to technicians, namely, recording scheduled physiological observations, and escalating deviations to supposed more knowledgeable staff, subsequently diminishing development of midwifery expertise.

Jane: You've got to do things by the book, ticking boxes to make sure that you cover your bum because if something goes wrong it's your fault. It's stopping you from thinking, seeing the bigger picture.

Though these mandated tools and processes enhanced safety and accountability by helping senior midwives to provide supervision for junior staff and those who were overwhelmed or fatigued. Camille shared that having a *helicopter view* created a *safety net* in the birth suite.

Camille: We have staff in birth suites that you can't see. EWTs helped that, more for the junior midwives but we take that helicopter view with the senior midwives too because fatigue can take over.

Close adherence to accountability conflicted with independent opinions. When discussing this the midwives expressed frustration, and emotional exhaustion because their passion caring for women was eroded. This led to emotional exhaustion and leaving the profession as expressed by Millicent.

Millicent: I was spending a lot of time being cranky and that was just the system, it wasn't good for my soul. When I left it was frustration at working in a system that wasn't looking out for women.

8.3.2 | Autonomy

The limited ability for midwives to practice to their full scope and provide care as an autonomous professional was evident in the data. Within institutional care, expert knowledge was not facilitated; that is, midwives were not encouraged to explore each woman's separate and often diverse experience. The one size fits all approach diminished the midwives' perceptions of autonomy and also reduced the women's autonomy in woman-centred care.

Parvin: We are dictated to that we must take observations at specific times, that this labour must fit within these timeframes. It's ridiculous, it takes away your autonomy, your ability to make judgments for yourself.

Not only does Parvin's statement suggest control over how the labour progresses as determined by organizational authority, rather than by physiological indicators, but it also undermines the skill and ability of the midwife and destroys the concept of birthing being a normal phenomenon. The concept of 'normal' was also challenged in the context of autonomous practice. This was recognized by Katha, who identified EWTs can inadvertently impact directly on the woman's well-being and impede critical thinking commensurate with taking independent action akin to autonomous practice:

Katha: What we are doing, at single measurements like blood pressure … … it's not high enough for a MET call, but it's significantly high for her, we don't look at the bigger picture, so what is missed is the woman herself because of that.

Such individual circumstances can manifest in several ways, such as, parameters being 'outside the normal', though still normal for the woman in labour. This was flagged by Rosemary:

> **Rosemary**: *It doesn't take into consideration the normal rigors of labour, even for a low-risk woman and you could easily get an alert, just because their vital signs may go outside of the pre-determined parameters of normal.*

In relation to individualized care, the participants acknowledged that a mechanism exists within EWTs for altering parameters. However, the participants, disclosed that only doctors were permitted to do so and that, generally, they did not exercise this option. The reluctance to alter EWTs to individual women was seen as a by-product of fear, and potentially reduced autonomous practice.

> **Soraya**: *Doctors are hesitant to change the parameters. They don't want to change the parameters to suit the woman. I think it's fear .... something going wrong and being blamed.*
>
> **Katha**: *It is only a consultant, or a senior registrar in consultation with the consultant who can change it but there is reluctance to making them individual to the woman.*

8.3.3 | Tensions across accountability and autonomy

These comments by Soraya and Katha demonstrate further complexity to the dual operation of accountability and autonomy. Staff capability and resources also impact power within practice. Organizational responsibility demands sufficient supply of functional resources. Consumption of time and resources to meet service demand was noted as a factor that could justify hastening birth. The finite resources required to meet service demand heightened awareness of associated risks such as staffing and bed vacancy. Participants identified that another limitation of EWTs was its sole focus on physiology and not resources. Midwives identified heavy workloads, but the EWT did not trigger an increase in resources to accommodate this. Emily identified limited utility of the tool in resource planning.

> **Misako**: *It's all about the mighty dollar, a woman is allowed to occupy this bed for a certain amount of time because more women are coming, and you don't have the bed capacity or staff to look after long labours.*
>
> **Emily**: *A major limitation would be that it doesn't trigger for staffing. It's just purely physiological, so, if you're getting behind in your workload, people aren't thinking I need to escalate that too.*

9 | DISCUSSION

Good midwifery practice delivered in appropriately resourced and supported units is reliant on managers to negotiate the elements of governance, recognizing the many ways information is collected and how it informs care of the labouring woman. This encompasses respecting experience, professional knowledge and the appropriate autonomy that should accompany the level of expertise of the midwife, alongside the diligent collection of physiological parameters of the labouring woman as directed by protocols.

In this study, all participants agreed that mandated assessments are paramount to safe birth. It is the how, when and the why of conducting these assessments, with their critical evaluation, that matters. Herein lies an opportunity for managers to create enabling environments that harness midwifery knowledge. By facilitating equitable collaboration that foregrounds midwifery, shared governance may be achieved. The findings of this study call for balanced approaches to support spontaneous birth whilst remaining alert to risks. The challenge for managers is harnessing the beneficial elements of EWTs whilst addressing deficits to redesign processes that provide flexibility in practice whilst maintaining safety.

Maternity unit managers' responsibility is impacted by financial constraints, rationalization, rapid advancement of technology, growing risk aversion and heightened expectations. Senior management culture significantly influences governance practices that impact organizational attitudes, values and behaviours of the team (Capitulo & Olender, 2019). EWT data are seen as more credible evidence compared to midwifery knowledge because it is presented in terms of medical contextualization (Downey et al., 2017). Managers can address this discord by facilitating equitable collaboration through acknowledging the skills and experiences of midwifery and incorporating these into decision-making. The synergies of knowledge from key stakeholders, regarding birth risk, promotes collaboration based on equality, fostering a more balanced approach.

Good governance is based on a framework of adaptive collaborative processes. Managing workplace relationships and building teams is important. Recognition of leaders at all levels requires an adaptive collaborative process that draws on established relationships together with creating new relationships. For governance to be strengthened, harnessing midwifery and obstetric expertise for mutual collaboration inspires inclusion of midwifery voices. This involves greater diversity in the sharing of knowledge amongst colleagues, including junior staff (DeChant, 2022). To do this, managers need to adopt transparent, inclusive strategies that provide a safe space for all voices to be heard. By providing a safe space for traditionally 'quieter voices', bottom-up contribution to governance, and the resultant policies become both native and oriented to the clinical setting. Subsequently, shared governance inspires staff buy-in, cultivates a no blame learning environment and dynamic partnerships between management, and staff who feel recognized and valued (Manley & Jackson, 2020).

Supporting all midwives to practice to their full scope of practice includes capturing and maintaining a safety net that supports the less

experienced but gives flexibility to those senior and more experienced people. The take home message for managers is to embed EWTs without this limiting scope of practice, critical thinking and avoiding the rigidity of a one size fits all system.

Midwives may be entrenched and fearful of taking ownership of their rightful power to make meaningful contribution to clinical governance. Transformative management must not only understand different perspectives but give credence to other perspectives for inclusion in the co-designing of governance policies. The onus is also on midwives, who must speak up, contribute their voices, knowledge and perspectives to clinical governance.

10 | LIMITATIONS

The findings reported herein were collected from Australian midwives working in various roles and models of care across several hospitals. It is accepted that not all maternity contexts, positions in organizational hierarchy, and models of care are represented in this study. Whilst our discussion pertains to governance and consideration to EWTs we did not examine outcomes of safety, rate of intervention or perinatal outcomes; therefore, we are not proposing outcomes from use of EWTs.

11 | CONCLUSION

This research is illuminative of governance practices and subsequently, presents considerations for managers. This includes the need to design policies that harmonize interprofessional expertise, emphasize midwifery practice and autonomy and promote individualization of care.

12 | IMPLICATION FOR NURSE/MIDWIFE MANAGERS

Managers are well positioned to orchestrate spaces that can be contentious when decision-making calls for different sources of information that do not readily align to suggest a clear, single pathway for best clinical practice. Rather, in complex situations, recommendations derived from expert knowledge, policy mandates, staffing capability and resources require further collaboration of key stakeholders. This paper highlights to midwifery managers that good governance is sustained through a nuanced appreciation and understanding of how multiple factors inform good practice. The findings reported here, ideally, encourage midwifery managers to work with stakeholders to draw on their expert experience, recognize competing elements during the birthing process, facilitate the collection of information from diverse sources, and have confidence in the deliberations of the team necessary to make the decisions for optimal outcomes for the birthing woman.

CONFLICT OF INTEREST
No conflict of interest for the authors to declare.

ETHICS STATEMENT
Ethics approval was received from the relevant institutional Human Research Ethics Committee (HREC) prior to the study commencing. Midwives were provided with an information sheet and consent form prior to participation.

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Contents continued from outside back cover

Contents continued

Contents continued