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REVIEW

The SALT and START Triage Systems for Classifying Patient Acuity Level: A Systematic Review

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Abstract

Background: Two common triage systems have been widely used in mass casualty incidents (MCIs) and disaster situations, namely START (simple triage algorithm and rapid treatment) and SALT (sort, assess, lifesaving, intervention, and treatment/transport). There is currently controversy regarding the effectiveness of SALT over the START triage system.
Purpose: This systematic review aims to compare the accuracy of the SALT and START triage systems in disaster and MCI settings.
Methods: The literature was searched using a systematic search strategy for articles published from 2009 to 2020 in the Medline, CINAHL, Web of Science, Scopus, PubMed, ProQuest databases, and the grey literature. This review included simulation-based and medical record-based studies investigating the accuracy and applicability of the SALT and START triage systems in adult and child populations during MCIs and disasters. All types of studies were included. The PRISMA flowchart was used to retain the articles, and the Joanna Briggs Institute critical appraisal tools were used to assess the quality of the reviewed studies.
Results: Of 1,450 articles identified in the search, 10 articles were included. It was found that the START triage system had a wide range and inconsistent levels of accuracy (44% to 94.2%) compared to the SALT triage system (70% to 83%). The under-triage error of the START triage system ranged from 2.73% to 20%, which was slightly lower than the SALT triage system (7.6% to 23.3%). The over-triage error of the START triage system (2% to 53%) was slightly higher than the SALT triage system (2% to 22%). However, the time taken to apply START triage system (70 to 72.18 seconds) was faster than for the SALT triage system (78 seconds).
Conclusion: The START triage system was simpler and faster than SALT. Conversely, the SALT triage system appeared to be slightly more accurate, more consistent, and had a lower rate of under- and over-triage error than START. It appears that neither the SALT nor the START triage system is superior to the other. Further research is needed to establish the most appropriate disaster and MCI triage system, especially for the Indonesian context.

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1. Introduction

Disaster and Mass Casualty Incidents (MCIs) occur in most communities and countries across the globe (Bazyar et al., 2019). A report from the United Nations for Disaster Risk Reduction (2015) stated that, between 1992 and 2012, approximately 4.4 billion people were victims of disaster, and 1.3 billion people died as a result of disaster and MCIs. Furthermore, the damage to infrastructure and humanity was accounted for about AU$3 trillion (United Nations for Disaster Risk Reduction, 2015).

Disasters and MCIs are categorized as large-scale catastrophic events that cause chaos in the community and result in an overwhelming number of victims (Lee, 2010). Therefore, disasters and MCIs affect local health systems and often result in lowering of their capacity to provide services due to inequities and lack of medical resources' availability (Culley & Svendsen, 2014). As a result of such inequities between demand and available resources, mortality and morbidity rates increase (Gaul, 2016). Therefore, the concept of triage, which leads to the

immediate sorting of disaster victims, is crucial to identifying people who have the greatest need for immediate medical intervention (Challen & Walter, 2013).

Triage refers to the categorizing or separating victims according to their level of acuity and need for immediate medical assistance (Bhalla et al., 2015). Triage aims to classify patients by determining the severity of their injuries in order to identify the greatest need for interventions among a group of victims (Bazyar et al., 2019). In addition, the purpose of triage in the disaster context is to maximize the number of survivors by identifying those victims who have a greater chance of survival and optimize limited healthcare resources appropriately (Bazyar et al., 2019). Simple Triage Algorithm and Rapid Treatment (START) is a global triage system that is commonly used in disaster and MCI contexts (Bazyar et al., 2019). The START triage system was developed by the Newport Beach Fire and Marine Department and Hoag Hospital in Newport Beach, California, in 1983 (US Department of Health and Human Services, 2019b). This is one of the oldest triage systems currently in use and aims to classify adult victims' levels of acuity into the following four triage categories, such as expectant (black), immediate (red), delayed (yellow), and minor (green) (Bazyar et al., 2019). A variation of START is known as jumpSTART, which was designed for triaging pediatric populations from infancy to 8 years old (US Department of Health and Human Services, 2019b). On the other hand, The Sort, Assess, Lifesaving Intervention, Treatment/Transport (SALT) triage system was established by the United States Centre for Disease Control and Prevention (CDC) in 2008 (US Department of Health and Human Services, 2019a). The SALT triage algorithm is a global sorting system that operates through simple voice commands and movement. The victims are then categorised into three groups based on their responses to voice command and their ability to move (US Department of Health and Human Services, 2019a).

The SALT triage system was developed as a new disaster and MCI triage system due to a lack of evidence regarding the effectiveness and accuracy of other major triage systems, including the START system (Gaul, 2016; Lerner et al., 2010). However, there is currently some controversy regarding the effectiveness of SALT over the START triage system. The SALT triage system is currently coming into question in relation to its accuracy and applicability in classifying patient acuity and achieving the best outcomes for victims of disasters and MCIs. A number of studies have claimed that SALT is more effective than the START triage system, while others have claimed that SALT is not as accurate as START. Therefore, SALT cannot completely replace the START system, despite the known advantages of the SALT model (Bhalla et al., 2015; Claudius et al., 2015; Cross et al., 2015). Therefore, a critical review of the literature on both triage systems is important to identify the accuracy and applicability of both triage systems in classifying levels of patient acuity.

According to Bazyar et al. (2019), many triage systems have been developed. However, no single triage system has been declared as the primary triage system for MCIs. Consequently, in a single MCI, it is possible that care providers will use different triage systems, potentially leading to confusion, delaying treatment, and contributing to increased morbidity and mortality rates (Gaul, 2016). Hence, it is crucial to propose a single model for primary use during MCIs. However, despite the ongoing controversy regarding the efficacy of the two models being explored in this paper, they are both widely used in many countries, including the USA, Canada, and Australia (Bazyar et al., 2019). Adding to the controversy, other studies have claimed that the SALT and START systems potentially lead to under- and over-triage classifications (Bazyar et al., 2019; Bhalla et al., 2015; Claudius et al., 2015; Cross et al., 2015; Fink et al., 2018; Kahn et al., 2010). In the case of MCIs, both under- and over-triage have negative impacts. Over-triage leads to distraction, overuse of resources, and delays in transport to medical services, while under-triage can cause delayed treatment, and therefore increase the risk of morbidity and mortality (Lee, 2010). Hence, through a critical review in the current research, the SALT and START triage systems can be appraised and summarized to determine whether SALT or START should be applied during MCIs. In addition, applying the most effective and accurate disaster and MCI triage system could result in reduced mortality and morbidity rates and could also improve the quality of life for people living in post-MCI and disaster areas. Therefore, there is a particular need for study by a systematic review of how effective and accurate the SALT and START triage systems are in classifying victims' levels of acuity during disasters and MCIs. This review aims to investigate the effectiveness of the START compared to SALT triage systems during disasters and MCIs.

2. Methods

2.1 Research design

This study can be classified as a systematic review due to its identification, selection, appraisal, and synthesis of high-quality research evidence relevant to the research question. According to Bettany-Saltikov (2012), a systematic review includes the identification, selection, appraisal, and synthesis of high-quality research evidence. Polit (2017) also points out that a systematic review is conducted through a rigorous research methodology in response to a specific research question.

2.2 Search methods

The search strategy began with a scoping search in the Google Scholar database to identify as many as keywords relevant to the topic under review as possible. Three concepts were developed: mass casualty incidents (MCIs) and disasters as concept 1, the START and SALT triage systems as concept 2, and level of acuity as concept 3. Each concept includes synonyms and subject headings. The findings were combined using *Boolean* terms (AND, OR, NOT) and subject headings.

The databases searched were Medline, CINAHL, Web of Science, Scopus, PubMed, ProQuest, Google Scholar, and the grey literature, which were published from 2009 to 2020. These databases were relevant to the topic under review and provided health-related journal articles. The relevant studies were selected and reported through the PRISMA (Preferred Reporting Items for Systematic Review and Meta-analysis*)* guideline (Bettany-Saltikov, 2012). This searching process was done by two authors (HP and SP).

2.3 Inclusion and exclusion criteria

The inclusion criteria were chosen to focus on the topic under review by the research team to limit bias. This review included studies that were primary qualitative and quantitative research studies, published in English or Indonesian from 2009 to 2020, considered at least a variable related to the implementation, evaluation, or characterisation of the SALT and START triage systems as well as compared the SALT and START triage systems. Studies that duplicated entries in the search results and incomplete studies were excluded.

2.4 Screening of articles

Two authors (HP and SP) separately screened the articles using PRISMA guidelines. The PRISMA guidelines have four phases, identification, screening, eligibility, and articles included (PRISMA, 2015). Any disagreements were discussed between the authors. In the identification phase, there were 1,450 articles retrieved through Google Scholar and 117 articles through database searching. Of these, 88 articles were eligible after duplicates were removed. After identifying the title and abstract, the number of studies included in the screening phase was 46, but only 39 were assessed for eligibility, while 7 were excluded as the articles were not full-text articles. Of the 39 articles assessed, 29 were not relevant to the topic under review and did not meet the inclusion and exclusion criteria. Therefore, only 10 articles were retained (Figure 1).

2.5 Data extraction

The review was achieved with the data separately extracted and summarized by HP and SP. The objectives of the study, the methodology, the results, and the significance of the topic under review were extracted using a table. The extraction tables were then consulted to KB and CM. The final extraction table can be seen in Table 1 (See appendix 1).

2.6 Quality appraisal

The 10-selected articles were assessed by two experts (KB and CM) for their quality in order to identify their strengths, weaknesses, utility, and validity. In addition, The Joanna Briggs Institute (2011)'s critical appraisal tools were used to evaluate the articles' quality. Critical appraisal tools were used to identify the appropriateness of the study design to the critical review question and determine the relevance of the articles to the topic under review (Polit, 2017). Some minor flaws of the studies were found; however, these were not significant enough to affect the study findings. Furthermore, the rigorous process found that all the articles reviewed were from level 2 to level 6 of evidence. According to Polit (2017), a systematic review

with meta-analysis is at the first level, and randomised controlled trial (RCT) methodology is considered to be at level 2, while non-randomised controlled trials (quasi-experiments) are level 3. Prospective/cohort studies are at level 4, followed by case-control and cross-sectional studies at level 5 and 6, respectively. Qualitative studies and expert opinion are at the bottom level of evidence. In this review, two studies were at level 2 (RCTs), one study was at level 3 (the quasi-experimental study), three studies were at level 4 (cohort studies), one was at level 5 (the case-control study), and three studies were at level 6 (the cross-sectional study). The quality appraisal and article's levels of evidence are presented in Table 2.

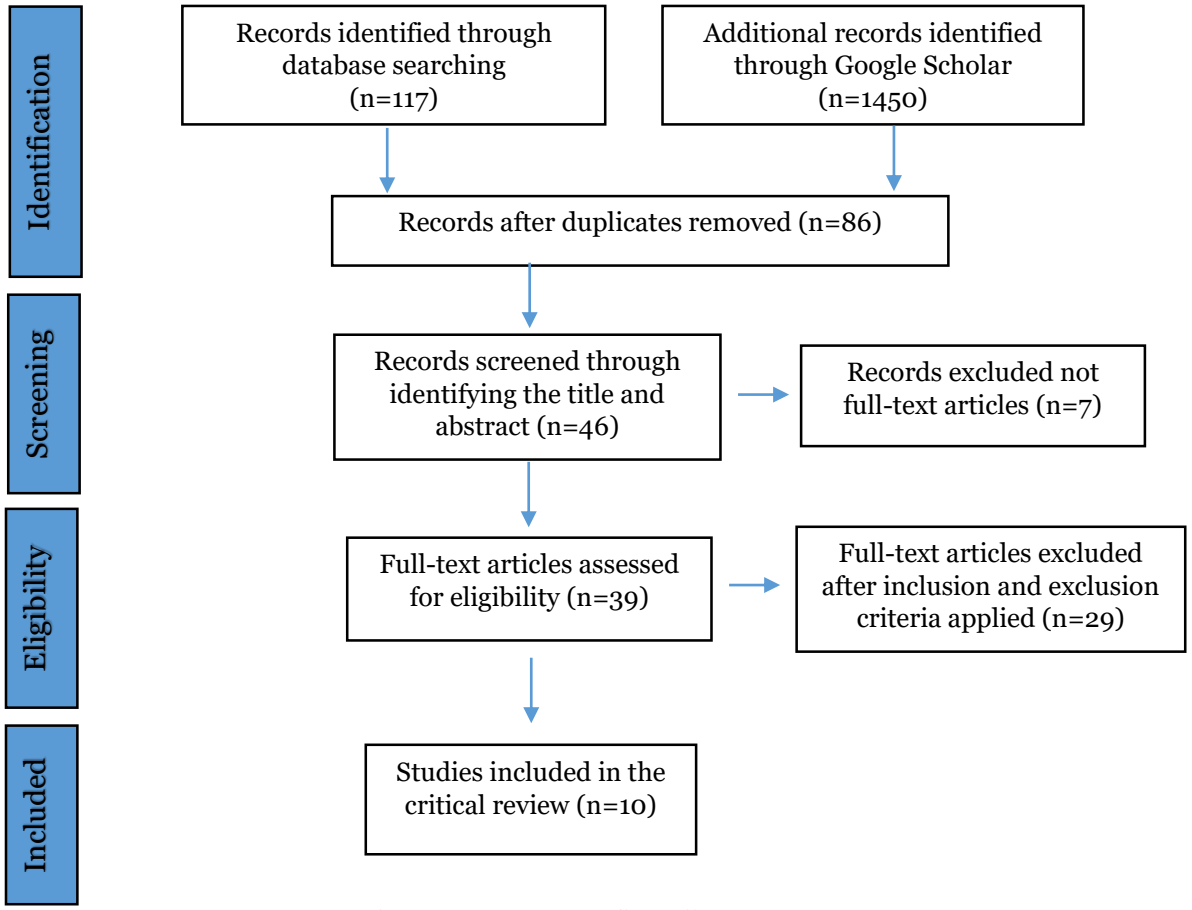

Figure 1. PRISMA flow diagram

2.7 Data analysis

This review could not perform a meta-analysis of the accuracy of the SALT and START triage systems due to heterogeneity in the methods and statistical values of the outcomes. Therefore, a thematic analysis was conducted (Nowell, 2017). The effectiveness and accuracy of the SALT and START triage systems were compared through four main themes: triage accuracy, over-triage, under-triage, and time to triage per individual victim. These findings are illustrated under the themed headings in Table 3.

Table 2. The level of evidence and quality of the articles

No of Article	Authors & Year	Methodology	Level of Evidence	Summary of Appraisal
1	Badiali et al. (2017)	Case-control	5	Good; This study was relevant to the topic, all criteria of the case-control study were met, and therefore, the findings were considered valid and reliable.
2	Cicero et al. (2016)	Cohort	6	Fair; This study was included in the topic under review even though the inclusion and exclusion criteria were not clearly mentioned. The authors

Table 2. Continued

No of Article	Authors & Year	Methodology	Level of Evidence	Summary of Appraisal
				described the participants' details, and also, the authors identified the confounding factors and applied a strategy to deal with these confounding factors. In addition, appropriate statistical analysis was used to investigate the findings.
3	Claudius et al. (2015)	Cross-sectional	6	Good; This study was included in the topics under review. Unlike some of the unclear explanations regarding the inclusion criteria of the sample, the authors clearly stated the confounding factors and ways of dealing with them. In addition, this study met the standards of a cross-sectional study.
4	Cone et al. (2011)	Quasi-experiment	3	Good; This study was relevant to the topic under review. All criteria for a quasi-experiment study were met. Therefore, this study was considered valid and reliable.
5	Hart et al. (2018)	Randomized control trial	2	Good; This study was relevant to the topic under review. Most of the RCT criteria had been met. Therefore, the findings of this study were considered to be valid and reliable.
6	Jones et al. (2014)	Randomized control trial	2	Good; This study was relevant to the topic under review and met the criteria of an RCT study.
7	Kahn et al. (2009)	A retrospective study	4	Fair; This study was relevant to the topic. This study met the criteria of a retrospective study, even though the authors did not clearly state how they dealt with the confounding factors. Overall, the results of the study were considered valid and reliable.
8	Lee et al. (2016)	Quasi-experiment	4	Good; This study was relevant to the topic under review. All criteria of a quasi-experimental study were met. Therefore, the study was recognised as valid and reliable.
9	Lerner et al. (2010)	Cross-sectional	4	Good; This study was relevant and considered to be valid and reliable. The authors dealt effectively with the confounding factors, which might limit any bias. In addition, this study met the criteria of a cross-sectional study.
10	Silvestri et al. (2017)	Randomized controlled trial	6	Fair; This study was considered relevant to the topic under review, regardless of some of the selection criteria of the RCT study not being clear. The findings of the study were considered valid due to meeting most of the criteria of a cross-sectional study.

3. Results

3.1 Characteristics of the study

Among the 10 articles reviewed, five studies investigated the accuracy of the START and jumpSTART systems, three explored the effectiveness of SALT, and two studies directly compared the accuracy of the SALT and the START/jumpSTART triage systems. In addition, of the ten articles reviewed, seven applied the SALT and START triage systems to adult populations, whereas three articles were applied in the paediatric population. Furthermore, eight of the ten studies were conducted through MCI victim simulations, whereas two analyzed MCI victims' medical records.

3.2 Effectiveness of the SALT and START triage systems

The effectiveness of the SALT and START triage systems were compared through four main themes: triage accuracy, over-triage, under-triage, and time to triage per individual victim (Table 3). The explanation of each theme is described below.

Table 3. The thematic analysis of systematic review

Main theme	Number of studies that support theme/subtheme
Accuracy of SALT and START triage systems	n=9 1,2,3,4,6,7,8,9,10 Badiali et al. (2017); Cicero et al. (2016); Claudius et al. (2015); Cone et al. (2011); Jones et al. (2014); Kahn et al. (2009); Lee et al. (2016); Lerner et al. (2010); Silvestri et al. (2017)
Over-triage of SALT and START triage systems	n=7 1,4,6,7,8,9,10 Badiali et al. (2017); Cone et al. (2011); Jones et al. (2014); Kahn et al. (2009); Lee et al. (2016); Lerner et al. (2010); (Silvestri et al., 2017)
Under-triage of SALT and START triage systems	n=7 1,4,6,7,8,9,10 Badiali et al. (2017); Cone et al. (2011); Jones et al. (2014); Kahn et al. (2009); Lee et al. (2016); Lerner et al. (2010); Silvestri et al. (2017)
Time to apply START and SALT triage systems	n=8 1,3,4,5,6,7,8,9 Badiali et al. (2017); Claudius et al, (2015); Cone et al. (2011); Jones et al. (2014); Kahn et al. (2009); Lee et al. (2016); Lerner et al. (2010); Hart et al. (2018)

3.2.1 Theme 1: The accuracy of SALT and START triage systems

According to the studies, the accuracy of the START/jumpSTART system ranged from 44% to 94.2%. The 44% accuracy was reported when the START triage system was applied to crash train victims' medical records in 2003 in the USA (Kahn et al., 2009), whereas the 94.2% accuracy was identified when this triage system was used in a review of the medical records of the Emergo Train System (ETS) victims in Italy (Badiali et al., 2017). In addition, in a simulated paediatric MCI scenario, medical students achieved a jumpSTART accuracy of 85.7% (Claudius et al., 2015). Moreover, Cicero et al. (2016), in their simulated MCIs study among medical students, found that jumpSTART was more accurate than other disaster and MCI triage systems. On the other hand, three mass casualty simulation-based studies identified the range of accuracy of the SALT triage system to be between 70% and 83%. The 70% triage accuracy for paramedic students using SALT was identified during a bus crash simulation (Cone et al., 2011), while a 79% accuracy was reported during a simulation of a four-car motor vehicle collision (Lee et al., 2016). Moreover, a previous study that involved trainees involved in a disaster course found that the accuracy of the SALT system was 83% during MCI simulations (Lerner et al., 2010).

Two articles were found that compared the accuracy of the SALT and START/jumpSTART triage systems in one MCI simulation-based study. Jones et al. (2014) found that paramedics achieved an accuracy of 66% for both the SALT and the START triage systems during a paediatric MCI simulation, while Silvestri et al. (2017) found that the SALT triage system was more accurate among medical response teams and fire rescue teams during MCIs and disaster simulations.

3.2.2 Theme 2: Over-triage of SALT and START triage systems

Over-triage refers to the over-estimation of the acuity of patients, indicating that the participants were given a higher level of patient acuity. The over-triage error of the START triage system was found in seven studies, ranging from 2% to 53%. The lowest over-triage error (2%) for first responders was reported during a simulated study (Silvestri et al., 2017), whereas the highest over-triage error (53%) was found in applying the START system to MCI train crash victims' medical records (Kahn et al., 2009). In contrast, the rate of over-triage error of the SALT system was from 2% to 22%, with the lowest rate (2%) being identified in the Silvestri et

al. (2017) simulation among first responders. The highest rate (22%) was found on the MCI simulation among paramedics by Jones et al. (2014).

The comparison of over-triage error between the START and SALT models was found in two studies. Silvestri et al. (2017) reported an over-triage error of 2% for both triage systems, whereas Jones et al. (2014) found over-triage errors of 22% and 23% for the SALT and START triage systems, respectively.

3.2.3 Theme 3: Under-triage of SALT and START triage systems

Under-triage means that there has been an underestimation of the acuity of injured victims or patients (Dolan & Holt, 2013). According to the ten studies reviewed, the under-triage error of the START triage system ranged from 2.73% to 20%. Two studies based on MCI victims' medical records reported an under-triage error of 2% (Badiali et al., 2017; Kahn et al., 2009), whereas two other MCI simulation-based studies revealed an under-triage error of 11% and 20% (Jones et al., 2014; Silvestri et al., 2017). Conversely, five studies found the under-triage error of SALT to be between 7.6% and 23.2%. Of these, four studies revealed under-triage errors of 7.6% (Lee et al., 2016), 9% (Silvestri et al., 2017), 10% (Jones et al., 2014), and 11% (Lerner et al., 2010) during mass casualty simulations. However, one study reported an under-triage error of 23.2% for paramedic students during a bus crash simulation (Cone et al., 2011).

When comparing the under-triage error of the START and SALT systems, one simulation-based study found that the START triage system had a higher rate of under-triage error than did SALT. According to Jones et al. (2014), the under-triage error of jumpSTART was 11.2% compared to 10% for the SALT triage system. Moreover, Silvestri et al. (2017) found that there was a significantly different rate of under-triage error between the START and SALT triage systems of 20% and 9%, respectively (Cone et al., 2011).

3.2.4 Theme 4: Time to apply START and SALT triage systems per individual victim

Time to triage refers to the mean time needed to triage one individual patient. There were eight studies investigating the time to apply the START and SALT triage systems to an individual patient. According to Claudius et al. (2015), the mean time to apply jumpSTART to paediatric scenario victims was 70.4 seconds. Similarly, Hart et al. (2018) found that the mean time to apply START in simulated patients was 72.18 seconds per patient. In addition, some studies also revealed that applying START was faster than SALT (Badiali et al., 2017). When comparing the START and SALT models, it was found that the time needed for applying the START model was 8 seconds faster than SALT (Jones et al., 2014).

4. Discussion

The purpose of this study was to compare the effectiveness and accuracy of the SALT and START triage systems in disaster and MCI settings. The result showed that the highest level of accuracy of the START system was recorded at 94.2% when this model was applied to the medical record data of MCI train victims in Italy. Whereas in another MCI victim medical record analysis from the USA, it was found that the accuracy of the START system was only 44% (Badiali et al., 2017; Cicero et al., 2016; Cone et al., 2011; Jones et al., 2014; Kahn et al., 2009; Lee et al., 2016; Lerner et al., 2010; Silvestri et al., 2017). This indicates that the START triage system is inconsistent in terms of accuracy. Accuracy means correctness and precision. In terms of triage, accuracy refers to the precise estimation of the acuity of injured patients as well as the correct allocation of time for patients to receive the medical intervention (Dolan & Holt, 2013). In contrast, the SALT model appears to be more consistent than the START triage system. This can be seen through the SALT accuracy percentages of between 70% and 84%. In addition, when comparing the accuracy of the START and SALT triage systems in a simulation study, it was found that the SALT was more accurate than the START triage system.

The findings of this critical review reveal that even though the START triage system was simpler and faster than the SALT triage system, the latter was more accurate and consistent. These findings concur with those of a previous study conducted by Fink et al. (2018), which revealed that the SALT triage system was preferable to the START triage system among 21st-century healthcare students. This is because the SALT triage system was considered to be more comprehensive, fit for all ages, and placed emphasis on saving lives (Fink et al., 2018). Nevertheless, the magnitude of these accuracy differences was relatively small and was only

found in a very limited number of studies. Only one study clearly stated that the SALT triage system was significantly more accurate and had a lower rate of under-triage (Silvestri et al., 2017). This indicates that SALT may not be significantly different from the START triage system in terms of accuracy. These findings also support a previous study conducted by Bazyar et al. (2019), which revealed that among 23 triage systems reviewed, no triage system was superior to the others. In addition, the lack of accuracy of the SALT and START triage systems might have been caused by the study setting. According to Jones et al. (2014), the use of a simulation scenario can result in inappropriate triage classifying. Jones et al. (2014) found that most of the respondents faced technical problems during the simulation, such as the blue light around the scene-setting, which could have influenced the interpretation of the patient's condition, with another issue being that some of the participants supposed to have a skin cyanosis condition which then affected the level of triage.

Similarly, the effectiveness of the START and SALT triage systems in relation to under-triage also showed a level of inconsistency. The START under-triage error ranged from 2.73% to 20%, while SALT was between 7.6% and 23.2%. However, in two specific studies which compared the START and SALT triage systems, one simulation study found that the under-triage error of START was greater than for the SALT triage system (Badiali et al., 2017; Kahn et al., 2009). Under-triage indicates that many patients or victims will not receive an intervention appropriately. According to the American College of Surgeons Committee on Trauma (ACS-COT), for general trauma, the rate of under-triage should be no more than 5%. Under-triage is recognised as a negative outcome for trauma victims of disasters and MCIs (Jeppesen, 2020). When comparing the under-triage error of the START and SALT systems, two studies found that the START triage system had a higher rate of under-triage error than did SALT (Jones et al., 2014; Silvestri et al. 2017).

Moreover, the effectiveness as indicated through over-triage found a wide range of errors. The over-triage error of the START triage system was reported as 2% to 53%, while the SALT was between 2% and 22% (Silvestri et al., 2017). There are no studies that revealed the over-triage error of one triage system as being greater than the other. However, one particular study found an over-triage error of 53% when START was applied to train crash victims' medical records in the USA (Kahn et al., 2009). Over-triage would have an impact on inefficient responses and would represent a higher risk to the entire emergency medical system (Dolan & Holt, 2013). This is because over-triage can add to the waiting time for emergency department triage, delay treatment for other patients, and trigger ineffective use of resources (Dolan & Holt, 2013). In the context of disaster, having more resources is vital due to the nature of MCIs and disasters, where resources are not balanced with demand (due to the high number of patients).

A confounding factor that might have contributed to the ineffectiveness of triage was related to the clarity of the SALT and START criteria. According to Lerner et al. (2010), the typical error of triage in SALT was in identifying the level of "minimal" criterion as the level of "delayed". The SALT triage system used the category "minor injury only" as the criterion for "delayed", which in turn, could have influenced the patient to use "delayed" instead of the "minimal" criterion. Therefore, this might have contributed to a number of under-triage errors. Similarly, the most frequent error of the START system was when identifying the "minimal" as the "delayed" category (Lee et al., 2016). In the START triage system, the criteria of "minimal" depended on patient mobility. If the patient could walk, they would be identified as "minimal" (US Department of Health and Human Services, 2019b). However, according to Lerner et al. (2015), the criterion of "minimal" is considered when patients do not require laboratory testing or have an uncomplicated fracture or a simple wound repair, whereas in (Kahn et al., 2009) study, the START triage system criterion placed a patient who is able to ambulate as "delayed" rather than "minimal". This lack of consistency creates the potential for both under- and over-triage. The study identifying factors which might have contributed to the ineffectiveness and inaccuracy of triage was related to the clarity of the SALT and START criteria are needed in the future.

The effectiveness of the triage system was related to the time needed to triage one individual patient. The mean time to apply jumpSTART to paediatric scenario victims was 70.4 seconds (Claudius et al., 2015). Another study similarly found that the mean time to apply START in simulated patients was 72.18 seconds (Hart et al., 2018). On the other hand, Cone et al. (2011) found that the SALT triage system needs 50.5 seconds to be applied in simulated patients, and Lee et al. (2016) reported that it requires 40 to 52 seconds to apply SALT triage

system. Based on those studies, the circumstances and scene size of MCIs in each study were different. Therefore, it cannot be assumed that SALT triage system was faster than START. However, one particular study which directly compared the mean time between START and SALT found that START triage system was 8 seconds faster that SALT which accounted for 26 seconds and 34 seconds, respectively (Jones et al., 2014). Hence, it is argued that START is faster than SALT because START has been developed for resource-limited field triage settings. Prioritizing patients in the immediate category of assisting patients who are more likely to survive than those in the high-risk category has made START faster than other triage systems (Silvestri et al., 2017; Lin et al., 2020). The delay in triage time could be an impact on the patient's outcomes, particularly in critically-ill patients, because it triggers delayed treatments (Claudius et al., 2015). In the MCI's context, the delay in triage time could be neglected by the other victims, which result in less victims being rescued. In the case of MCIs, the red category patients need to be transported maximally one hour earlier than other categories (Kahn et al., 2009). Hence, minimizing delay in applying triage is essential.

5. Implications and limitations

It is acknowledged that it was difficult to draw a conclusion due to design limitations in many studies in this review. The issues of technical problems during study interventions as well as inappropriate study simulation may lead to an inaccurate conclusion. In addition, the heterogeneity of study populations leads to difficulty comparing results across the study, which influences the conclusion. Nevertheless, the findings of the review could be used to inform the Indonesian Ministry for disaster preparedness about the most effective triage system to use during disasters and MCIs. The SALT triage system appears to be slightly more accurate and consistent than START; however, the impact on patient outcomes is still questionable.

6. Conclusion

This systematic review has revealed the effectiveness of the START and SALT triage systems in relation to the level of accuracy, under- and over-triage, and the time needed to apply these triage systems in the MCI and disaster contexts. The evidence indicated that even though the START triage system is simpler and faster than SALT, there is some inconsistency in the level of accuracy of the START triage system in classifying victim acuity. Conversely, the SALT triage system appears to be slightly more accurate and consistent and has a lower rate of under- and over-triage error than START. Therefore, it appears that neither the SALT nor the START triage system is superior to the other. Moreover, regardless of triage error, either the START or the SALT triage system can be equally effective for triaging victims of disasters and MCIs, and therefore, can be applied in the MCI and disaster contexts. However, a study that identifies factors that might have contributed to the inaccuracy of the START and the SALT triage system, as well as inaccuracy itself, requires further research to establish the most appropriate disaster and MCI triage system for the Indonesian context.

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Author contribution

HP conceptualized, designed, prepared the initial draft and framework, wrote the paper, and interpreted the data. KB, CM, and SP conceptualized and interpreted the data. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

No conflict of interest has been declared by the authors.

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Appendix 1.

Table 1. Extraction table of the included studies

No	Authors (year)	Objectives	Methodology	Results	Significant to the topic under review
1	Badiali et al. (2017)	To determine the accuracy of the START triage system for improving patient outcomes.	Design: Case-Control Sample: 400 non-medical ambulance crew Setting: The participants were assigned to two groups. The first group received training in the START triage system, whereas the other group did not get training. Each group was assigned to examine triage code to 6,000 patients medical record Emergo train system Italia.	1. The START triage group was faster than the non-START group in completing the evaluation (15 and 30 minutes, respectively). 2. The accuracy of the START group was 94.2% compared to 59.83% of the non-START triage group. This difference was statically significant. 3. The START group over-triage was 13.6% as opposed to 26.5% in the non-START group. 4. Under-triage accounted for 2.73% for the START group and 3.08% for the non-START group. 5. START was found to be effective for improving patient outcomes.	This research is related to the topic under review (the START triage system) and contributes to: - Theme 1 (accuracy) - Theme 2 (under-triage) - Theme 3 (over-triage) In addition, this research revealed that the use of the START algorithm is more effective than the non-START algorithm for improving patient outcomes during MCIs.
2	Cicero et al. (2016)	To compare the accuracy of the Smart triage system and the jumpSTART system, Clinical Decision Making (CDM), and no algorithm in classifying patient's level of acuity.	Design: Cohort Sample: 273 paramedics who enrolled in a Paediatric Disaster Triage (PDT) curriculum Setting: Participants were divided into cohorts by triage strategy to apply disaster triage to 10 simulated disaster victims.	1. The accuracy of jumpSTART was statistically greater than SMART (P<0.001; OR [odds ratio]: 2.03) and CDM (P=0.02; OR: 1.76). 2. JumpSTART outperformed Smart for RED and yellow patients, while CDM for BLACK patients.	This research revealed that the accuracy of jumpSTART was greater than other triage systems such as SMART and CDM, particularly in classifying "immediate/red" and "delayed/yellow" patient categories. This study contributes to: - Theme 1 (accuracy of START/ jumpSTART)
3	Claudius et al. (2015)	To evaluate the accuracy of jumpSTART in mass casualty incidents, particularly for paediatric patients	Design: Cross-sectional Sample: 33 students Setting: All participants applied jumpSTART to 363 scenarios of paediatric MCI victims (actor and computer simulation)	1. The overall accuracy of jumpSTART was 85.7% 2. The mean time to assign jumpSTART on one paediatric MCI victim was 70.4 seconds. Notably, this time depended on the level of patient acuity, meaning that the time would decrease as the triage level decreased, or the mean time would increase as the triage level increased.	This study revealed the accuracy of jumpSTART as well as the mean time to apply this triage in paediatric MCI victims. This study contributes to: - Theme 1 (accuracy) - Theme 4 (time)

Table 1. Continued

No	Authors (year)	Objectives	Methodology	Results	Significant to the topic under review
4	Cone et al. (2011)	To compare the effectiveness of the SALT and SMART triage systems in classifying the level of MCI victims acuity	Design: Non-random control trial (quasi-experimental) Sample: 22 paramedic students Setting: Participants have been trained in the SALT triage system and applied it to 25 victims of a bus crash in a virtual reality simulation. After three months, the participants were also retrained in the SMART triage system and applied it to the same victims (25 victims of the bus crash).	1. The accuracy of SALT was 70% compared to 93% for SMART (p=0.0001). 2. Over-triage was 6.8% for SALT and 1.8% for SMART (p=0.0015). 3. Under-triage was 23% for SALT and 5.1% for SMART. 4. The SMART triage time to triage the scene was faster than SALT at 11 minutes and 59 seconds, and 21 minutes and 3 seconds, respectively (p=0.0001).	This research was related to the topic under review (SALT), which revealed that the accuracy and time of the SALT triage system were statistically worse than the other triage algorithm (SMART). This study contributes to: - Theme 1 (accuracy) - Theme 2 (under-triage) - Theme 3 (over-triage) - Theme 4 (time)
5	Hart et al. (2018)	To compare the speed of response between the START triage system and an intuitive triage system	Design: Randomized controlled trial Sample and setting: Two groups of participants were assigned to apply the START triage algorithm and an intuitive triage on simulated MCI victims	1. The intuitive triage was faster to identify victims level of triage compared to START (72.18 seconds vs. 106.57 seconds), particularly in identifying patients with "red/immediate" and "yellow/delay" criteria. 2. No statistical difference in the incidence of under- and over-triage between START triage and intuitive triage.	This study was relevant to the topic under review where the speed of response of the START triage was recorded. The research findings revealed that there was no statistical significance between START triage and intuitive triage in terms of accuracy. However, they varied significantly in terms of speed of response, with intuitive triage being faster than START triage. This study contributes to: - Theme 1 (accuracy) - Theme 4 (time)
6	Jones et al. (2014)	To compare the effectiveness of the jumpSTART and the SALT triage systems in the pediatric population during a mass casualty incident	Design: Randomized controlled trial (RCT) Sample: 43 paramedics Setting: All participants were randomly divided into either the SALT or the jumpSTART study group. A fifteen-minute lecture on the SALT and jumpSTART triage systems was given. All participants were assigned to apply triage to 10 paediatric simulated patients based on which group they were in.	1. The accuracy of SALT and jumpSTART was 66% each. 2. Over-triage was 22% for SALT compared to 23% for jumpSTART. 3. Under-triage was 10% for SALT compared to 11.2% for jumpSTART. 4. jumpSTART was statistically faster than SALT (8 seconds faster).	This study was relevant to the topic under review. The study findings revealed that there were no differences in accuracy between the SALT and START triage systems. However, jumpSTART was statistically faster than SALT when applied to a paediatric population. This study contributes to: - Theme 1 (accuracy) - Theme 2 (under-triage) - Theme 3 (over-triage) - Theme 4 (time)

Table 1. Continued

No	Authors (year)	Objectives	Methodology	Results	Significant to the topic under review
7	Kahn et al. (2009)	The objective of this study is to investigate the sensitivity and specificity of the START triage system	Design: A retrospective study Sample: 148 train crash victims from 2013 Setting: The authors applied the START triage system to the medical records of 148 victims a train crash disaster in 2003.	1. The accuracy of the START triage system was 44.5%. 2. Over-triage was 53.3%. 3. Under-triage was 2%. 4. The transportation of a patient in the red/immediate category was 1 hour earlier than in the other categories. 5. This study concluded that SALT has poor sensitivity when applied to a database of MCI victims.	This study was related to the topic under review. According to the study findings, the accuracy of the START triage system when applied to an MCI victim database was low, while over-triage appeared to be high. However, the START triage system had high sensitivity in transporting patients in the "red/immediate" category. This study contributes to: - Theme 1 (accuracy) - Theme 2 (under-triage) - Theme 3 (over-triage) - Theme 4 (time)
8	Lee et al. (2016)	To investigate the accuracy of the SALT triage system on simulated MCI patients	Design: Quasi-experimental Sample: 67 students Setting: 67 paramedic and fire science participants were assigned to apply SALT to a four-car motor vehicle collision. A 30-minute dictate period was given prior to the study.	1. The accuracy of SALT was 79.9% for paramedics and 72% for fire science students. No significant difference. 2. Over-triage was 10.2% for paramedic students compared to 15.2% for fire science students. 3. Under-triage was 7.6% for paramedics and 8.7% for fire science students. 4. The paramedics needed 52.6 seconds to do triage compared to 40.5 second by the fire science students. 5. The study concluded that paramedics seemed to perform more accurately than fire science students, even though this was not statistically significant.	This study was related to the topic under review in terms of measuring the accuracy of the SALT triage system and the speed of triage. This study contributes to: - Theme 1 (accuracy) - Theme 2 (under-triage) - Theme 3 (over-triage) - Theme 4 (time)
9	Lerner et al. (2010)	To assess the accuracy of the SALT triage system when applied to simulated MCI victims	Design: Cross-sectional Sample: 73 trainees of a disaster course Setting: Participants were assigned to apply the SALT triage system for 217 simulated victims. A 30-minute lecture was given prior to the study.	1. Accuracy of the first triage was 81% to 83% afterwards. 2. 6-8% were over-triaged. 3. 10-11% were under-triaged. 4. The speed of triage for every patient was 28 seconds. 5. The authors concluded that SALT was accurate in classifying patients in MCI cases.	This study was relevant to the topic under review. This study revealed that SALT had high accuracy in classifying MCI patients. This study contributes to: - Theme 1 (accuracy) - Theme 2 (under-triage) - Theme 3 (over-triage) - Theme 4 (time)

Table 1. Continued

No	Authors (year)	Objectives	Methodology	Results	Significant to the topic under review
10	Silvestri et al. (2017)	To compare the accuracy of the SALT and START triage systems in classifying patient levels in a mass casualty incident	Design: Experimental random controlled trial Sample and setting: Multi-agency regional Fire and Rescue Response and Florida State Medical Response Team assigned SALT and START to 82 simulated MCI victims	1. Overall, the SALT triage system was a more accurate triage method than START at classifying patients, specifically in the delayed and immediate categories. 2. SALT had a significantly lower under-triage rate (9 per cent [95%CI 2-15]) than both START (20 per cent [95%CI 11-28]) and field triage (37 per cent [95%CI 24-52]). 3. There were no significant differences in over-triage rates.	This study was relevant to the topic under review; the study results suggested that the SALT triage system was more accurate than START, which had significantly lower under-triage. This study contributes to: - Theme 1 (accuracy) - Theme 2 (under-triage) - Theme 3 (over-triage)

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ORIGINAL RESEARCH

The Effect of Islamic Spiritual Mindfulness on Self-Efficacy in Anger Management among Schizophrenic Patients

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Abstract

Background: The prevalence of schizophrenia has increased in the last few years. Nevertheless, methods in assisting schizophrenic patients have not improved significantly. Islamic spiritual mindfulness is a spiritual approach that can help schizophrenic patients increase their self-efficacy in anger management. However, the application of this intervention is still not well researched.
Purpose: This study aimed to determine the effect of Islamic spiritual mindfulness on self-efficacy in anger management among schizophrenic patients.
Methods: This study utilized a pre-post quasi-experimental design with a control group. A total of 54 schizophrenic patients were purposively recruited and divided into two groups: the intervention group (n=27) and the control group (n=27). The intervention group received four sessions of Islamic spiritual mindfulness in two weeks, while the control group received a standard intervention from the hospital. The data were collected using the Regulatory Emotional Self-Efficacy (RESE) scale and analyzed using the t-test.
Results: The results showed a significant difference in self-efficacy scores between the control and intervention groups (p=0.000) after the intervention. In the pre-test, the mean score of self-efficacy in the intervention group was lower than the control group (M=28.15 vs. M=30.26) without a significant difference. However, in the post-test, a significant difference in self-efficacy between the intervention and control groups was found (M=46.44 vs. M=46.44; p=0.000).
Conclusion: Islamic spiritual mindfulness significantly affects self-efficacy among schizophrenic patients. The Islamic spiritual mindfulness can be applied as a new form of approach to increase self-efficacy in schizophrenic patients.

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1. Introduction

Schizophrenia is a chronic and severe mental disorder that is characterized by distortions in thinking, perception, emotions, language, sense of self, and behavior. Schizophrenia affects at least 20 million people worldwide, with common experiences including hallucinations (hearing voices or seeing things that are not there) and delusions (fixed, false beliefs) (World Health Organization, 2019). This type of disorder is associated with considerable disability and may affect educational and occupational performance (World Health Organization, 2019). In addition, research shows that males are more likely to be affected by this disorder than females (Falkenburg & Tracy, 2014).

The prevalence of schizophrenia in Indonesia has increased in the last few years. According to the Basic Health Research in 2018 (Ministry of Health Republic of Indonesia, 2018), the prevalence of patients with schizophrenia in Indonesia has increased from 1.7% in 2013 to 7% in 2018. In Central Java, a province in Indonesia, the number of people with schizophrenia has significantly increased from 2.3% in 2013 to 8.7% in 2018 (Ministry of Health Republic of Indonesia, 2018). A preliminary study in a psychiatric hospital in this province also found 318 cases of relapses and readmissions of schizophrenia patients in less than one month in 2018. This condition requires an evaluation of nursing interventions in caring for patients with schizophrenia, focusing on the awareness that this disease is detrimental if it is not controlled.

Patients with schizophrenia who experience delusions can easily get angry and use violence against people they believe hurt them (American Psychiatric Association, 2013). Uncontrolled anger in schizophrenic patients can lead to violent behaviors that may hurt other people. A previous study has shown that the risk of violent behaviors as an expression of anger in male schizophrenic patients was 4.6 times higher than the general population; in contrast, female schizophrenic patients were 23.3 times higher (Ringer & Lysaker, 2014). Violent behaviors committed by schizophrenic patients may also increase the healthcare expenses since it is the most frequent cause of admission to the hospital, and the length of stay will be longer as the signs of the behaviors are persistent (Volavka, 2014). Anger and risks of violent behaviors among schizophrenic patients are manageable through adaptive copings

Self-efficacy is an important factor in producing adaptive copings. Self-efficacy has been associated with daily functioning in schizophrenia through its relationships with cognition, negative symptoms, and functional capacity (Bryce et al., 2018). Self-efficacy, by definition, is how individuals believe in their ability to conduct an action (Bandura, 1997). According to Dwidiyanti et al. (2018), self-efficacy is influenced by individual experiences of success, the experience of others, verbal persuasion, and physiological and emotional conditions. Low self-efficacy affects maladaptive copings so that good self-efficacy is required by patients with a risk of violent behavior to control their anger (Leon-Perez et al., 2011). High self-efficacy can change an individual's behavior, motivate learning to carry out the best treatment, and prevent relapse (Bandura, 1994). Self-efficacy in anger management will depend on individuals' beliefs about their ability to express their negative affect, and this should be a concern for nurses (Carpara et al., 2009). The ability of self-efficacy in anger management includes the efficacy of controlling negative emotion, efficacy of controlling positive emotion, and efficacy of controlling anger (Nocentini et al., 2013). Self-efficacy in schizophrenic patients is crucial because learning from successful experiences will boost self-confidence resulting in better self-efficacy (Bandura, 2012).

Research shows that psychoeducational interventions are useful for patients to increase their emotion regulation, but are not effective for patients with high negative affect (Cameron & Jago, 2008). Spiritual mindfulness is an intervention that can make patients aware of their condition, without judgment and with full acceptance, so that they are not only able to control negative affect but also raise awareness of positive affect (Davis & Zautra, 2013). Mindfulness is also evident to stimulate changes in brain structure, especially cingulated anterior cortex, insula, hippocampus, temporoparietal intersection, and fronto-limbic tissue, that are related to increasing self-efficacy and self-regulation needed by schizophrenic patients to regulate and control emotions, feeling, and behavior (Shonin & Van Gordon, 2016). Mindfulness teaches how to be more resilient with an individual's present condition, make an objective assessment, and focus on solving problems (Isgandarova, 2019). Mindfulness helps schizophrenic patients improve their self-efficacy in order to change behaviors and deliver more adaptive coping mechanisms so that they can manage anger and behavior (Leon-Perez et al., 2011). Research also shows that mindfulness can increase psychological well-being and mental health (Ijaz et al., 2017) and significantly increase self-efficacy in family caregivers in caring for patients with mental disorders (Rokhyati et al., 2019).

To date, many forms of mindfulness-based therapy models have been practiced and explored, one of which is Islamic spiritual mindfulness. The Islamic spiritual mindfulness is done with a high level of awareness, believing that every problem an individual is experiencing comes from Allah (God) and it is only Allah that has the power to overcome; Islamic spiritual mindfulness refers to a spiritual state of an individual who is conscious of the awareness of Allah over their soul, innermost thoughts/feelings, and actions (Dwidiyanti et al., 2019; Munif et al., 2019). A high level of mindfulness is associated with high Muslim spiritual welfare (Thomas et al., 2018). Islamic spiritual mindfulness not only helps patients control their negative affect but also helps patients raise their awareness without any judgment and accept it with ease (Dwidiyanti et al., 2018). Islamic spiritual mindfulness also increases the ability to control emotion in adult patients (Sadipun et al., 2018). Mindfulness is evident to provide benefits for patients with schizophrenia. However, spiritually based mindfulness, especially Islamic spiritual mindfulness, requires a more in-depth study to be applied to schizophrenic patients. Accordingly, this study aimed to determine the effect of Islamic spiritual mindfulness on self-efficacy in anger management among schizophrenic patients. This study expects to bridge the gap between mindfulness-based therapy and Islamic religion and help mental health nurses to cope with violent behavior among schizophrenic patients.

2. Methods

2.1 Research design

This study used a pre-post quasi-experimental design with a control group.

2.2 Setting and samples

This study was conducted in a psychiatric hospital in Semarang, Indonesia, from October to November 2020. The population was all schizophrenic patients admitted to the specified hospital. A purposive sampling technique was utilized to recruit the patients who met the inclusion criteria, including schizophrenic patients with risk of abusive behavior, Muslim, male or female aged 19-45 years old, being calm and cooperative, and did not undergo electroconvulsive therapy (ECT). Patients who did not complete all stages of the research were excluded from the study. A total of 54 patients were recruited and then divided into two groups: the intervention group (n=27) and the control group (n=27). The number of samples included in this study was calculated based on the formula of mean difference hypothesis test that has been used in a previous study, in which the mean and standard deviation in the intervention group was 8.57±4.89 (n=21) while the mean and standard deviation in the control group was 3.45±1.93 (n=24) (Yilmaz & Okanlı, 2017). We obtained a sample size of 27 for each group (intervention and control) based on this calculation.

2.3 Intervention

The Islamic spiritual mindfulness adapted from Dwidiyanti et al. (2019) was given to the intervention group for four sessions; each lasted for 30-45 minutes. This intervention consisted of five steps of mindfulness: a moment of awareness, self-evaluation, body scan, repentance, prayer, and relaxation. The intervention was given every three days in two weeks by the research team and took place in a counseling room at the psychiatric ward in the hospital. The complete procedure of Islamic spiritual mindfulness is shown in Table 1. In this study, the intervention group received both the Islamic mindfulness intervention and standard therapy in hospitals for patients with schizophrenia. Meanwhile, the control group only received standard therapy in the hospital for patients with schizophrenia.

Table 1. Intervention procedures

No	Steps	Aim	Methods
1	A moment awareness	To bring out patients' desires or impulses according to the patients' needs to pray to Allah.	- Asked the patients to concentrate and do *istighfar* (ask for forgiveness) while breathing. - Encouraged the patients to believe that Allah would help and heal all the problems.
2	Self-evaluation	To help identify the mistakes and sins committed by the patients in the past.	- Guided the patients to remember all the mistakes and sins such as envy, revenge, fear, anxiety, and despair. - Guided the patients to remember any mistake that they have made to others. - Asked the patients to write down all their sins and mistakes.
3	Body scan	To help patients feel the response in the form of physical complaints.	- Asked the patients to keep *istighfar* while breathing and identify physical complaints such as heart palpitations, shortness of breath, headache, nausea, and others.
4	Repentance and prayer	To help patients ask for forgiveness and pray to Allah.	- Guided the patients to do *istighfar* after they realized all mistakes and sins and invited them to ask for Allah's forgiveness and pray.
5.	Relaxation	To help patients to relax after praying and admitting their mistakes.	- Guided the patients to take a deep breath - As a result of a body scan, patients might feel some physical complaints. For example, if the patients felt dizzy, shortness of breath, and nausea, asked the patients not to hold it. Instead, asked the patients to cry, vomit, or cough so that they felt more relieved.

2.4 Measurement and data collection

This study used the Regulatory Emotional Self-Efficacy (RESE) scale (Carpara et al., 2009) for data collection. Permission to use this instrument was obtained from the original author. The RESE scale was translated into the Indonesian language and back-translated into the English language by two independent translators. No significant difference was found in the result from the backward and forward translations. The validity and reliability test of the RESE scale was conducted on 20 schizophrenic patients out of the research subjects with risks of violent behavior in a psychiatric ward in Semarang. The result showed that the scale was valid with the Pearson's correlation scores ranging from 0.757 to 0.935 and reliable with α=0.965.

The RESE scale consisted of 12 questions with 5 Likert scales, including not well at all (1), not well (2), neutral (3), well (4), and very well (5). The total score was obtained from the cumulative scores of questions number 1 to 12. The total score for self-efficacy ranged from 12 to 60. A higher score indicated a higher self-efficacy (Carpara et al., 2009). In addition, demographic data of the participants were also collected, including age, sex, education, occupation, and length of hospitalization. A homogeneity test on categorical data like sex, education, and occupation was conducted using the Chi-square test, while numerical data like age and length of hospitalization were examined using Levene's test. The questionnaires were administered to the respondents in both groups before and after the intervention of the Islamic spiritual mindfulness.

2.5 Data analysis

The data of self-efficacy in anger management were analyzed by comparing the result of the pre-test and post-test in both groups. Before that, the normality test was conducted using the Shapiro-Wilk test. The data distribution was significantly normal (p>0.05). Therefore, a paired t-test was used to analyze the difference in self-efficacy in anger management in both groups before and after the intervention. Furthermore, the independent t-test was used to analyze the effect of the intervention on self-efficacy in anger management.

2.6 Ethical considerations

This study was approved by the Health Research Ethics Committee of Dr. Amino Gondohutomo Psychiatric Hospital, Semarang, with a reference number of 420/6028. Informed consent was explained to and signed by the patients prior to their participation in this study. The informed consent was also signed by the researcher and the nurses that were responsible for the patients.

3. Results

3.1 Characteristics of the participants

Table 2 shows that most participants in the intervention group were males (63%), high school graduates (63%), and entrepreneurs (55.6%), with a mean age and length of hospitalization of 32.33 and 2.74, respectively, while in the control group, the majority were males (51.9%), high school graduates (59.3%) and unemployed (70.4), with a mean age and length of hospitalization of 29.56 and 1.89, respectively. All variables were homogenous (p>0.05): age (p=0.323), gender (p=0.582), education (p=1.000), occupation (p=0.099), and length of hospitalization (p=0.161). No differences in the characteristics of respondents were found between the two groups.

Table 2. Characteristics of respondents

Variable	Group				*p*-value (X^2)
	Control f(%)	Intervention f(%)	Control (Mean±SD)	Intervention (Mean±SD)	
Age	-	-	29.56±7.80	32.33±8.89	0.323*
Gender					
Male	14 (51.9)	17 (63.0)	-	-	0.582**
Female	13 (48.1)	10 (37.0)			
Education					
Middle School	11 (40.7)	10 (37.0)	-	-	1.000**
High School	16 (59.3)	17 (63.0)			

Table 2. Continued

Variable	Group				*p*-value (X^2)
	Control f(%)	Intervention f(%)	Control (Mean±SD)	Intervention (Mean±SD)	
Occupation					
Entrepreneur	8 (29.6)	15 (55.6)	-		0.099**
Unemployed	19 (70.4)	12 (44.4)			
Length of hospitalization	-	-	1.89±1.40	2.74±1.56	0.161*

*Levene's test; **Crosstab Chi-square

3.2 Differences in anger management between the intervention and the control group

Table 3 shows a significant difference in anger management between the control group and the intervention group before and after the intervention. The mean value increased from 30.26 to 34.59 in the control group and from 18.29 to 46.44 in the intervention group.

Table 3. Differences in self-efficacy in anger management before and after the intervention between the control and intervention groups

Groups	Mean Difference	Pre-test		Post-test		*p*
		Mean±SD	Min-Max	Mean±SD	Min-Max	
Control	4.33	30.26±9.15	15-47	34.59±7.56	21-49	0.000
Intervention	18.29	28.15±10.09	15-57	46.44±4.93	35-59	0.000

3.3 Effects of Islamic spiritual mindfulness on increasing self-efficacy in anger management

Table 4 shows no significant differences in self-efficacy in anger management in both groups (p=0.424), before the intervention. The mean value was 28.15±10.09 in the intervention group and 28.15±10.09 in the control group. After the intervention, a significant difference in self-efficacy between the two groups was found (p=0.000). The results of the post-test showed that the intervention group had a higher mean value (46.44) than the control group (34.59).

Table 4. Effects of Islamic spiritual mindfulness on increasing self-efficacy in anger management

		Control		Intervention		*p*
		Mean±SD	Min-Max	Mean±SD	Min-Max	
Self-efficacy	Pre	28.15±10.09	15-47	28.15±10.09	15-57	0.424
	Post	34.59±7.56	21-49	46.44±4.93	35-59	0.000

4. Discussion

This study was conducted to determine the effect of Islamic spiritual mindfulness on self-efficacy in anger management among schizophrenic patients with a risk of violent behavior. The results indicated a difference in self-efficacy between schizophrenic patients who received the Islamic spiritual mindfulness and those who received standard hospital care. In addition, the mean score of self-efficacy in the intervention group was significantly higher than that in the control group. The result of this study is congruent with previous studies, which showed that mindfulness increased self-efficacy in cancer patients (Sanaeia et al., 2014) and neurological overeating patients (Aghajani et al., 2020). Similarly, a previous study found that mindfulness increased psychological well-being and mental health (Ijaz et al., 2017).

The results of previous research conducted on respondents with emotional disorders showed that greater use of describing, acting with awareness, and accepting without judgment, as part of mindfulness were associated with greater coping self-efficacy. Basically, mindfulness aims to direct a person to be able to observe, describe, act with awareness, and accept without judgment (Luberto et al., 2013). In an individual's life, the key dimension for self-understanding is spirituality. This spirituality is part of relationship, social engagement, understanding of meaning

and purpose in life, and an overall sense of happiness and joy (Kavar, 2015). Spiritual health is closely related to psychological well-being (Bożek et al., 2020) because a person's beliefs and religion affect the way a person responds to the problems they face. With this in mind, spiritual intervention shows great potential to be applied to patients with psychiatric disorders (Agorastos et al., 2014). The basis of this knowledge then underlies the intervention of spiritual mindfulness to increase the spirituality level of patients with schizophrenia so that patients can be more calm and sincere to overcome their problems (Triyani et al., 2020).

The Islamic spiritual mindfulness is a mindfulness practice based on Islamic values in its implementation. Islamic spiritual mindfulness teaches individuals to believe that prayer, effort, and surrender to God are a form of the healing process (Dwidiyanti et al., 2019). Religion and beliefs continuously affect the practice of care in everyday life, both in a person and in the community (Zaidi, 2018). People who can establish a good relationship with God are marked by their ability to pray, feel grateful, be able to introspect themselves and participate in religious activities. When a good relationship between humans and God is created, positive thoughts will appear, mental health will increase, and good relationships will be established between individuals and other humans and their environment (Dwidiyanti et al., 2019). In this study, participants performing the Islamic spiritual mindfulness felt a sense of calm and realized that Allah (God) is the One who can help patients overcome the problems; it made the participants' self-efficacy increase to control themselves. Based on a previous study with the same Islamic spiritual mindfulness, yet measuring other parameters, it was also found that the Islamic spiritual mindfulness had positive effects in patients to control their anger, be aware of their problem, accept it with ease without any judgmental feeling, and not overreact through the process of considering the God (Dwidiyanti et al., 2018). Specifically, efforts to improve spiritual health can lead to self-efficacy as a form of mental health (Chabok et al., 2017).

The results of this study indicated that there was an increase in self-efficacy in both groups: those schizophrenic patients who received the Islamic spiritual mindfulness intervention and those who received standard interventions from the hospital. However, the average self-efficacy of the intervention group was higher than the control group. This shows that interventions, such as cognitive-behavioral therapy (Budiman et al., 2020) and psychoeducation (Solehah et al., 2019), can increase self-efficacy in people with schizophrenia, but this intervention will be more effective when accompanied by spirituality-based mindfulness. Other studies using the general type of mindfulness stated that mindfulness increased self-efficacy and reduced negative symptoms, e.g., anger (Borders et al., 2010; Turner et al., 2016). The basic understanding of Islamic spiritual mindfulness teaches patients to believe that prayer, effort, and resignation is a form of the healing process. When a person has a good relationship with Allah, there will be a positive mind and also a good relationship with others (Dwidiyanti et al., 2018). Islamic spiritual mindfulness is a therapy that can increase emotional flexibility so that an individual will not feel stressed easily. Mindfulness can decrease physical pain with body scanning and repair pulmonary activity (Dwidiyanti et al., 2018). Implementing mindfulness to increase self-efficacy is appropriate with the Bandura's theory that self-efficacy is affected by four main resources, i.e., mastery experience, vicarious experience, verbal persuasion, and physiological and emotional state (Bandura, 1994). Self-efficacy could be modified by decreasing the stressful reaction, changing the preference of negative emotion, and changing an erroneous interpretation of knowing the body condition (Bandura, 1997). The present study has shown that Islamic spiritual mindfulness can help schizophrenic patients increase their self-efficacy.

5. Implications and limitations

This study provides evidence of an alternative nursing intervention that can be utilized to support the existing and well-known methods in the patient therapy programs to increase self-efficacy. Nurses in general or specifically mental health nurses could implement the Islamic spiritual mindfulness to help patients increase their self-efficacy, especially in relation to anger management. The present study has been successful in investigating the effect of Islamic spiritual mindfulness on increasing self-efficacy in schizophrenic patients; however, some limitations are warranted. This study did not employ randomization in recruiting and assigning the participants and involved a small sample size. Despite the limitations, the results of this study provide us with some insight into the possibility of using the Islamic approach to help patients.

6. Conclusion

The Islamic spiritual mindfulness provides a significant effect on increasing self-efficacy in anger management among schizophrenic patients. This study could provide scientific evidence of a new innovation in nursing care, i.e., the Islamic spiritual mindfulness, especially to prepare patients to improve their ability to control anger and prevent violent behavior independently. Further research needs to be conducted to validate this new method using different research designs and larger sample sizes.

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Author's contribution

All authors contributed to the study conception and design (MD, AMR, DRS), data collection and analysis (MD, AMR, DRS), and manuscript preparation and revision (MD, AMR).

Conflict of interest

The authors hereby declare that there is no conflict of interest in this study, either to any institutions or individuals.

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ORIGINAL RESEARCH

The Fluid Management Experience in Patients with Chronic Kidney Disease Undergoing Hemodialysis in Indonesia: A Qualitative Study

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Abstract

Background: Fluid management can reduce mortality, severe comorbidities, and debilitating symptoms in patients on hemodialysis. Therefore, a restricted fluid intake plan is crucial for patients with chronic kidney disease (CKD). Little evidence has been found to date on exploring the experience in fluid management of CKD patients in Indonesia.
Purpose: This study aimed to explore the fluid management experience of adults with chronic kidney disease participating in hemodialysis treatment in Indonesia.
Methods: A qualitative study with a phenomenological approach was conducted. Purposive sampling was used to recruit 14 adults patients with CKD undergoing hemodialysis in a tertiary hospital in Padang between July and September 2020. Manual content analysis using the Colaizzi approach was used to identify themes.
Results: Data analysis revealed four themes with 12 sub-themes. The four major themes include the challenge of thirst control, fluid/diet restriction management, inadequate information, and the support system.
Conclusion: The result showed the severe suffering and sadness experienced by CKD patients who conform to fluid restrictions. It is important to provide clear information on the fluid prescription or the exact consumable amount per day. Structured education with a personal approach is recommended to ensure detailed information regarding "fluid prescribing". The support obtained from family, friends, and dialysis staff is a significant factor in promoting acceptance and adherence.

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1. Introduction

Chronic kidney disease (CKD) is a complex condition in which the kidneys are unable to function properly as a result of structural or functional damage that leads to excessive fluid and waste accumulation in the blood (Thomas, 2019). Nowadays, the prevalence of CKD is rising significantly. The estimated number of affected people ranges from 11% to 13% globally (Hill et al., 2016). Indonesia is characterized by a high incidence rate of chronic kidney disease, alongside a steadily increasing number of people participating in hemodialysis yearly. The Indonesian Renal Registry (IRR) reported 77,892 active hemodialysis users in 2017, which significantly increased to 132,142 in 2018, where 66,433 new patients were recorded at the end of 2017 alone. In 2019, the number increased to 185,901 with new patients of 69,124. Moreover, West Sumatra is amongst the top 5 Provinces with the highest number of patients in 2018, with 1,334 patients actively participating in hemodialysis therapy (Indonesian Renal Registry, 2018).

Food and fluid intake restrictions have been identified as the most frequent stressor expressed by chronic kidney disease patients with hemodialysis (Hong et al., 2017). Also, the fluid restriction was considered to be the most difficult, due to the persistent feeling of thirst (Nazly et al., 2013), especially after ingesting drugs with the capacity to dry out the mucous membrane, e.g., diuretics. At the intrapersonal level, the most frequently discussed barrier to fluid restriction adherence was physiological symptoms, such as thirst and dry mouth (Lee et al., 2020). Moreover, food intake also elevates sodium, causes thirst, and influences water intake, leading to interdialytic weight gain (Maimani et al., 2021). Therefore, dietary regulation is also a critical aspect to consider while limiting patient fluid intake (Thomas, 2019).

The success of CKD treatment is highly dependent on the patient following the recommended fluid restriction and diet. The patient's ability to manage fluid restriction is related to the patient's knowledge, ability, and willingness to manage their own health care. It is related to interventions that encourage positive adherence behavior (Carman et al., 2013). Patients committed to fluid restriction have been shown to have fewer hospitalizations, lower morbidity, improved survival and better clinical outcomes (Carman et al., 2013). Therefore, patient commitment to fluid and dietary restriction is essential to improve poor adherence among CKD patients (Theofilou, 2013).

However, CKD patients' compliance to fluid restriction is still low. The previous research showed that none of the participants achieved high levels of engagement with fluid restriction. Eleven percent (11%) had moderate levels and the majority (88.9%) had low levels of engagement with fluid restriction (Chironda & Bhengu, 2016). Many factors influence patients' adherence to the therapy, including patient-related factors, such as patients demographics, physical and mental function, disease and treatment perception, and disease-related factors such as laboratory parameters, comorbidities, and the stage of chronic kidney disease (Seng et al., 2020). Some of the reasons for unsuccessful management of the hemodialysis treatment regimen include poor attendance, itching, uncontrolled glucose, catheter infections, work, holidays, and weekends (Ford-Anderson, 2011)**.** However, non-adherence has been implicated in increased interdialytic weight gain (IDWG), and excessive IDWG has been linked with unfavorable clinical consequences and is considered an independent predictor of all-cause and cardiovascular mortality in patients undergoing long-term HD (Lindberg, 2010; Maimani et al., 2021). Patient non-adherence to fluid restriction also contributes to severe complications, including intradialytic cramping and episodes of hypotension, medication-related fatigue, and dizziness, lower extremity edema, ascites, left ventricular hypertrophy, and congestive heart failure, hypertension, shortness of breath, and pulmonary vascular congestion or acute lung edema (Lindberg, 2010).

The act of proper dieting and limiting fluid intake reduces patient complaints, especially for those with depression potentials (Cox et al., 2017). Therefore, a restricted fluid intake plan is crucial for patients with chronic kidney disease. Systematic review of qualitative studies by Palmer et al. (2015) showed significant confusion between nutritionists and nurses on the hemodialysis unit's fluid prescriptions. This makes most patients make personal dietary decisions undermining the recommendation. Dietary limitations and a lack of credible dietetic advice frustrate patients with CKD who want to take a proactive approach to preventing CKD progression and maintaining their health (Kelly et al., 2017).

CKD patients often use multiple coping strategies. A study showed that various factors such as treatment modality, time since diagnosis, presence of other chronic comorbidities, and self-perceived limitations contribute to types of coping strategies used by CKD patients (Subramanian et al., 2017). Although some patients have self-management strategies to "take control" of their own symptom management to improve their quality of life, such as managing fluid and dietary restrictions, managing fatigue, and managing depression, adherence to fluid intake limitation is significant to reduce complaints (Cox et al., 2017).

Several studies have revealed numerous strategies for overcoming thirsts, such as sucking on frozen gauze, ice cubes, gargling with menthol liquid, chewing gum, acupressure, using a thin straw, or saliva substitutes (Garcia et al., 2016; Yang et al., 2010). However, success is influenced by several factors, including respondent characteristics, demographics, patient habits, and culture (Garcia et al., 2016). Previous research revealed that patients' perspectives regarding the management of fluid restriction in chronic hemodialysis were diverse and were likely influenced by various patient characteristics, including their experience with hemodialysis. Having good knowledge with accurate self-assessment and positive psychological factors were also described as having a beneficial role for adherence for fluid restriction. Social networks such as family and friends, dialysis providers, and peers sometimes facilitated and sometimes were barriers to attaining fluid restriction goals (Smith et al., 2010). By considering these patient perspectives on the importance of issues in the management of fluid restriction, we hope to guide future interventions to be patient-centered and culturally sensitive.

On the other hand, Indonesia is a tropical country, especially Padang, West Sumatra province, which is located on the coast. The tropical climate in Indonesia poses a challenge for chronic kidney disease patients expecting to limit fluid intake. Previous research has also shown

the contributory role of season or weather in fluid restriction (Thomas, 2019). Patients predominantly from the Minangkabau ethnicity tend to like spicy and salty dishes. This also causes increased thirst and high fluid intake. Therefore, it is required to explore fluid management experience in CKD patients in Padang, Indonesia. Also, to the author's knowledge, no study to date has focused on exploring experiences of CKD patients in fluid management in Indonesia. Therefore, the purpose of this study was to explore fluid management experiences of chronic kidney disease patients participating in hemodialysis therapy in Indonesia.

2. Methods

2.1 Research design

A qualitative study with a phenomenological approach was conducted, where this method was used to obtain firsthand experience on fluid management from chronic kidney disease patients participating in hemodialysis therapy. This phenomenological approach describes a person's knowledge structure and attempts to capture the main themes and the individual's interpretation. Therefore, in-depth information is obtained regarding this phenomenon, and an opportunity is also provided for patients to freely express feelings about their fluid management experiences (Creswell & Poth, 2016).

2.2 Setting and samples

In phenomenological studies, it is important that all participants experience the phenomenon being studied (Creswell & Poth, 2016). Thus, a purposive sampling strategy was used to recruit participants. The CKD patients undergoing hemodialysis were recruited from the hemodialysis units of one public hospital in Padang, West Sumatra, Indonesia. The inclusion criteria included: (1) patient age ≥18 years, (2) chronic kidney disease patients undergoing hemodialysis for over six months, (3) able to narrate personal experiences, (4) willing to be interviewed, (5) and capable of speaking Indonesian or Minangkabau language. The researchers approached and delivered information to the head nurses at the research location about the objectives and the research procedures. The researchers asked them for help to obtain data on patients in their units to identify potential participants. Together with the head nurses, the researchers identified potential patients as participants based on the established inclusion criteria. Recruitment was ceased when data saturation was reached (Creswell & Poth, 2016). The total participants were 14 patients.

2.3 Data collection

This study was conducted between July and September 2020 by first and second researchers. Semi-structure interview guides were used to explore the experiences and perceptions of participants. The interview guidelines were made based on theory of fluid and diet restrictions on CKD patients (Daugirdas et al., 2015). The interview venues were selected to suit the participants' preferences, whether during the hemodialysis process or while in the hospital waiting room. All patients were recruited during the treatment time, approximately 30 minutes after the commencement of the hemodialysis. On average, each in-depth interview lasted for 30 to 60 minutes. Participants might answer questions using Indonesian or Minang language. The interview guide was developed from three open-ended questions, "Tell us your experience with limiting fluid intake?", "How do you deal with thirst?", and "How do you avoid foods with high fluid content?". Probing questions such as: "Please, can you gave some examples on how you deal with these feelings …?", and "what were your actions?" were also asked to elicit more information about their experiences and the significance attached to those experiences. Other probing questions were dependent on the flow from the participant's narrations. However, the interview was recorded with an audio-recorder and directly transcribed verbatim by the first and second researcher. Data saturation was confirmed when there were no new codes found to culminate into properties of another theme for the experience of fluid management in the subsequent in-depth interview sessions (Mason, 2010) after the number of 14 participants.

2.4 Data analysis

Each audio-recorded interview was transcribed verbatim within 24 hours after the interview to avoid any recall biases and begin the initial data analysis process, which used thematic

analysis with the Colaizzi approach. All data processes were handled manually by first and second researcher. Furthermore, the following steps were involved: (1) Reading and copying all interview descriptions disclosed by participants, (2) Extracting significant statements (directly related to the phenomenon under investigation), (3) Describing the respective meaning, (4) Combining the denotations into groups and themes, (5) Developing a complete theme description (a comprehensive depiction of participant's experiences of fluid management), (6) Identifying the structural basis of the phenomenon, and (7) finally, returning the findings to the participants for validation (Creswell & Poth, 2016). The example of theme developing process for the second theme can be seen from Table 1. At the final validation, the data verification was sought through co-researcher validation and sharing the findings with the participants to verify that these findings reflected the participants' actual meaning. For publication, the transcripts were translated into English from the original Indonesian.

Table 1. Example of theme developing process

Significant Statement	Category	Sub-Theme	Theme
"I take a medium-high glass in the morning, and a little after eating before taking the prescribed medication with a sip. Also, I take another during lunch only when eating. However, what important is achieving a wet throat." "I only drink when ready to eat and after ingesting the medicine. The collective quantity is often a bottle during the day and one at night, accumulating to 600 ml."	Drink after eating and ingesting medicine	Set drinking time/schedule	Fluid/diet restriction management
"Warm water effectively eases my thirst and makes the stomach feel good." "I have a preference for chilled water; hence I freeze frequently and drink the melted content in little bits."	Drink warm or chilled water	Modifying the temperature of the drink	

2.5 Rigor and trustworthiness

The credibility, dependability, confirmability, and transferability criteria were used to attain trustworthiness in this study (Polit & Beck, 2008). Triangulation and member check were used to provide high data trustworthiness for the study's findings. Data source triangulation was achieved by comparing the interview results with three nursing staffs and four patients' relatives/ caregivers, direct observations, and field notes. To determine the acceptability of the data gathered from participants, the interview findings were sent to all participants in the form of transcripts. Participants were asked to provide their feedback resulting in that all the participants agreed with the transcripts. It was also done to validate the results, as it is the most critical technique to establish credibility and allow participants to reflect on experiences (Mays & Pope, 2020). The dependability in this study was maintained by involving an expert in qualitative research to audit and analyze a series of research processes. Confirmability was done by debriefing the study results with all research team to ensure that there was no bias in analyzing and developing the themes. All researchers were agreed with all findings. Finally, the researchers tested transferability by summarizing the study's findings and then providing a narrative explanation of the interview results. It was done to help readers clearly understand the results of the research, and could use and apply the results of the study elsewhere.

2.6 Ethical considerations

The data collection process commenced after ethical clearance was obtained from the Health Research Ethics Commission with a reference number of 209/KEPK/2020. This research was in line with the principles stipulated in the Declaration of Helsinki (World Medical Association, 2013). The participants were contacted according to the predetermined criteria, and study objectives were explained. Therefore, content containing information related to the research was provided after obtaining patient consent, which explained the research objectives, procedures, discomfort, risks, benefits, and expectations. The study was performed following

the hospital's health protocols. The transcribed data were saved in a password-protected parent folder in a Microsoft Word document that was anonymized and pseudonymized. Folders in use were kept safe, while anonymity ensured that none of the participants would be linked to their narrated stories. Only the researchers were privy to the data of this study.

3. Results

3.1 Characteristics of the participants

The characteristics of participants are described in Table 2. The participants consisted of 7 women (50%) and 7 men (50%). Most of them were 46-60 years old (57.1%), bachelor's degree (35.7%), married (78.6%), not employed (57%), and 1-3 years undergoing hemodialysis (50%). All participants were Minang ethnicity.

Table 2. Characteristics of participants

Characteristics of participants	f	%
Age (years)		
26-45	5	35.7
46-60	8	57.1
>60	1	7.1
Gender		
Male	7	50
Female	7	50
Ethnicity		
Minang	14	100
Education		
Elementary school	1	7.1
Junior High School	4	28.6
Senior High School	4	28.6
Bachelor's degree	5	35.7
Marital Status		
Married	11	78.6
Separated or divorced	2	14.3
Single	1	7.1
Employment Status		
Full time	4	28.6
Part-time	2	14.2
Not employed	8	57
Duration of Hemodialysis therapy		
<1 years	3	21.4
1-3 years	7	50
>3 years	4	28.6

3.2 Fluid management experiences

Data analysis revealed four themes and 12 sub-themes that showed patients' experiences managing fluid for adults with CKD undergoing hemodialysis. The challenge of controlling thirst control, managing dietary/fluid limitations, inadequate information, and social support were four main themes extracted from the data. Table 3 illustrates the themes and sub-themes.

3.2.1 The challenges of thirst control

A majority of the participants acknowledged being tormented by the fluid's limitations. This was due to the inevitable thirst experienced during numerous activities, weather conditions, and the inner desire to drink. The challenges in controlling the thirst include feeling torture of thirsty and combating bodily need for hydration.

3.2.1.1 Feeling torture of thirsty

Participants stated that holding back the craving to drink water was identified as the most excruciating part of chronic kidney disease. This experience was highlighted from the participants' statements:

"Holding back from drinking water is the most challenging aspect. This has made me contrive various tips, including buying small drinking bottles to limit my intake. However, I eventually tend to drink repeatedly." (P11, female, 31 years)

Table 3. The developed thematic map of experience on fluid restriction

Theme	Sub-theme
The challenge of thirst control	Feeling torture of thirsty
	Combating bodily need for hydration
Fluid/diet restriction management	Setting drinking time/schedule
	Modifying the temperature of the drink
	Distraction technique
	Healthy eating for CKD
	Management of edema
Inadequate information	Unspecific fluid prescription
	Inaccurate perception/ Misconceptions
The support system	Family as source of strength
	Peer support
	Professional advice

Moreover, other participants also stipulated similar torturous events, with the following statement excerpts:

"… but it is tough to avoid water. This thirst is highly torturous …" (P14, female, 57 years)

3.2.1.2 Combating bodily need for hydration

Increased fluid intake is also associated with outdoor activities. Some participants also insinuated the impact of hot weather as a reason for the thirst as observed with the following statements:

"…I barely become thirsty at home because I predominantly relax and sleep, except I am involved in outdoor activities. However, it is difficult to hold thirst on occasions involving relatively high activities." (P13, female, 52 years).

"The weather around my home is scorching. This makes it difficult to ignore thirst." (P7, male, 63 years).

These conditions, as stated above, were implicated to increased thirst, and the individual's body needs to lead to an increased demand for fluids.

3.2.2 Fluid/ diet restriction management

The present theme is further explained as five sub-themes of setting drinking time/schedule, modifying the temperature of the drink, distraction technique, healthy eating for CKD, and management of edema.

3.2.2.1 Setting drinking time/schedule

All participants attempted to set drinking time/schedule to limit the daily fluid intake, based on the following statements:

"I take a medium-high glass in the morning and a little after eating before taking the prescribed medication with a sip. Also, I take another during lunch only when eating. However, what is important is achieving a wet throat." (P8, female, 55 years).

"I only drink when ready to eat, and after ingesting the medicine. The collective quantity is often a bottle during the day and one at night, cumulated to 600 ml." (P10, female, 58 years).

3.2.2.2 Modifying the temperature of the drink

The drinking water temperature of most participants was purposely modified to speed up thirst reduction. However, a warmer variant was preferred, based on the following statements:

> "Warm water effectively eases my thirst and makes the stomach feel good…" (P1, male, 32 years).

Conversely, some participants preferred using cold water or ice cubes.

> "I have a preference for chilled water, hence, I freeze frequently and drink the melted content in little bits." (P11, female, 31 years)

3.2.2.3 Distraction technique

Some participants adopt the distraction technique to reduce thirst. A total of two participants actively participated in Muslim worship activities with the Sunnah fasting on Monday and Thursday. Moreover, some other respondents took showers or rested in an air conditioner room as a form of distraction.

> "Therefore, I participate in blood dialysis on Tuesday and Friday. Most times, I am doing Sunnah fasting three days after Friday 's HD (hemodialysis) to Tuesday because I feel too heavy from excess drinking on Monday. This is one way to avoid gaining additional weight and is followed by having a little drink after breaking the fast." (P10, female, 58 years).

> "… I anticipate taking frequent baths before prayer time as a means to reduce drinking or fluid intake. This approach is helpful because of the hot weather in my residential area, which increases thirst. Also, my children put on the air conditioner in my bedroom to help me rest appropriately while sleeping, avoid overheating and dehydration." (P7, male, 63 years).

3.2.2.4 Healthy eating for CKD

All participants acknowledged the types of foods to be avoided by patients with chronic kidney disease. Some participants also ingested superfoods/multivitamins to increase endurance and stamina, in addition to the vitamins prescribed at the hospital. These are evidenced by the statements:

> "…I avoid eating fruits with high water and potassium content; hence I only consume papaya. (P12, female, 38 years).

> "I drink honey mix with water and also consume tea imported from abroad (Regina tea), termed 'the Bunga', for improved appetite. Furthermore, I cut garlic into pieces and soak them in water to achieve a black color before adding sugar and drinking. Also, I eat Habatussaudah, a lot of fish oil, including those from Kling, aqufish or fishqua." (P3, male, 58 years).

3.2.2.5 Management of edema

Body edema was one of the significant challenges that participants experienced after consuming excess fluid from food or drink. This manifestation predominantly occurs in the extremities and on the face, based on the statements:

> "…I pay attention when my legs become swollen, particularly after exceeding the stipulated drinking limit. Also, the sensation of cramps at the feet is imminent after taking excess liquid during hemodialysis." (P13, female, 53 years).

Edema management required certain activities, including the regulation of daily fluid intake, performing sweat emission-related activities, including walking, and sunbathing. Also, the participants reported managing fluid by regulating the intake, as stated in the following statements:

"...I also like to sunbathe in the morning, and possibly take a walk to sweat out the fluid." (P3, male, 58 years).

"…. I tend not to drink in the absence of thirst and when the tongue is not dry, but only when eating. At this point, just one bottle (pointing to 1 330 ml bottle of aqua) is sufficient all through to the night, especially on days when I did not run out." (P9, male, 33 years).

3.2.3 Inadequate information

All participants acclaimed to have been provided with education by doctors and nurses upon diagnosis. The information shared was based on foods to be avoided, fluid intake limitation, and the potential impact of non-adherence. However, the knowledge shared by dialysis staff was not detailed, as doctors and nurses stipulate the need to reduce fluid intake. The present theme is further explained as two sub-themes of unspecific fluid prescription and inaccurate perceptions/ misconception.

3.2.3.1 Unspecific fluid prescription

The participants reported that the clinicians do not inform in detail the quantity to be reduced or consumed per day. This decision is left to the respondent's discretion, as stated below:

"… There is no detailed explanation stipulating the amount of liquid to be taken, as the health care provider simply asks the respondents to drink less. This is particularly the case after I gain much weight." (P5, male 54 years)

".. In the beginning, the clinicians said to me to limit fluid consumption, so, I must drink a little, as well as fruits such as bananas, but the amount is not conveyed…" (P11, female ,31 years)

Based on the choice of fluid, participants often objectively estimate a personal dose, as indicated by the following responses:

"… I estimate my fluid intake by monitoring the tendency for swellings." (P5, male 54 years).

"...We develop personal limits by self-evaluation for body comfort. Therefore, this is the quantity I can afford daily (pointing to a 330ml aqua bottle)." (P9, male, 33 years).

3.2.3.2 Inaccurate perception/ Misconception

Most participants had an inaccurate perception in interpreting the body symptoms due to inadequate education. In addition, one of the participants assumed it is alright to eat and drink at will on the day before hemodialysis therapy. This was because of the misconception that the fluids and toxins from food are expected to be filtered out during the treatment, as observed with the following statement:

"… I usually drink one 600 ml bottle of aqua a day. However, I consume as much and as possible on the days before scheduled dialysis because I expect the fluids and toxins to be sucked out when dialyzed." (P11, female, 31 years).

3.2.4 The support system

This critical theme that emerged from the interviews reflects another dimension of participants' support from family, peer, and professional advice.

3.2.4.1 Family as source of strength

The support from family members, including husband/wife, and children had a significant impact on participants during hemodialysis, as stated below:

> "... My child always reminded me not to drink excess water. This activity helps in maintaining my weight gain at 1kg between dialysis. However, a rise by 2kg is possible in some instances, therefore making the range of 1-2kg." (P14, female, 57 years)

> "... my wife is very kind, as she is always there somehow in my life to remind me not to drink too much, also to eat healthily..." (P5, male, 54 years).

3.2.4.2 Peer support

Participants also acknowledged the support and attention received from friends in the hemodialysis unit, sharing knowledge on how to limit fluid intake, based on the following statements:

> "... when I gain about 4 kg, Yaya (her name) ... monitor this appetite and drink, or you become bigger... joking." (P11, female, 31 years)

> "...my friend said when he was thirst, he tried to divert to other activities such as chatting with friends, watching television, or take a bath, he thinks it works." (P9, male, 33 years).

3.2.4.3 Professional advice

The participants reported that they receive supports from dialysis staffs like nurses, doctors, and technicians, based on the following statements:

> "The nurses tend to admonish me, saying, you should not drink a lot... drink less, or you become tight, you know ..." (P11, female, 31 years)

> "...when the doctor visits, he always said to limit fluid intake and organize my diet intake because my interdialytic weight gain always over 3 kg, and I have edema in my leg." (P5, male, 54 years)

4. Discussion

This study aimed to explore the fluid management experience of adults with chronic kidney disease participating in hemodialysis treatment in Indonesia. The study resulted in four major themes of participant's experiences in the fluid management. They were the challenge of thirst control, fluid/diet restriction management, inadequate information, and the support system.

4.1 The challenge of thirst control

The result of the research showed that majority participants stated that they feel tortured of thirsty suffered from fluid restriction. Thirst or dry mouth is one of the most frequently occurring symptoms in hemodialysis (HD) patients. A study reports that patients CKD reported a widely varying range of thirst intensity, with the majority of subjects having a moderate intensity of thirst. A half of the participants (52.4%) reported that their felt thirsty all the time. Most of the subjects (82.1%) used drinking to reduce their feeling of thirst, 14.3% subjects used other methods to reduce thirst symptoms, such as chewing gum, and 3.6% ignored the feeling of thirst (Yang et al., 2010). The unavoidable thirst due to many activities, weather conditions, and the desire from within to meet fluid needs, encourages participants wanting to drink. The challenges faced by participants are different, depending on the activities that the participants are doing. Therefore, patients tend to feel more suffering and possibly lose control (Stevenson et al., 2018). Thirst control is the most challenging aspect for patients compared to restrictions in terms of diet and other micro-nutrients (Nerbass et al., 2017). A previous study also reported that the contexts of physical discomfort in CKD patients are immobility, hypotension, pain, hunger, cramp, tiredness, polyuria, itching, edema, thirst (Freire et al., 2020). The adherence to fluid intake limitations is a priority in the nursing intervention (Lucena et al., 2018), and non-compliance from patients is influenced by several factors. These include dry mouth conditions, the need to drink while taking medications, the numerous activities performed outside the room, and the hot weather implicated in extreme thirst (Sarkar et al., 2006).

4.2 Fluid/diet restriction management

The results of this study confirm that proper management of fluid is essential for patients with chronic kidney disease. Patients who are committed to fluid restriction have been shown to have fewer hospitalizations, lower morbidity, improved survival and better clinical outcomes (Carman et al., 2013). However, restriction fluid is the main difficulties reported by patients (Carman et al., 2013; Nazly et al., 2013). Food and fluid intake restrictions have been identified as the most frequent stressor expressed by chronic kidney disease patients with hemodialysis (Hong et al., 2017). Moreover, dialysis is an intervention designed to regulate salt, to remove fluid (ultrafiltration, sodium dialysate), and to limit the intake between each session. Also, proper hemodynamic management is a significant component of an adequate patient dialysis program (Canaud et al., 2019). The study results are congruent with a study by Chiaranai (2016) regarding patients' experiences of obtaining treatment and expecting to live with certain limitations and dependence on medical technology. Therefore, survival in this stressful situation is likely to the severity of end-stage cancer (Cho & Shin, 2016).

The hemodialysis patients are also encouraged to reduce fluid intake to control potential interdialytic weight gain (Biruete et al., 2017). This manifestation is associated with higher mortality risk (Rhee et al., 2018). Dialysis prescription has a direct impact on IDWG. This includes adequate UF, sodium profiling, and dialysis time. The use of oral diuretics can be of value in patients on regular HD with residual urine output (Maimani et al., 2021). This concept is not widely understood by patients, as inadequate information regarding the fluid prescriptions and patient ignorance towards the agreed policies have led to the practice of individual determinations at will (Dasgupta et al., 2016).

The patients usually can drink 500 ml of fluids plus the diuresis volume, meaning that anuric patients have more difficulty to manage their thirst. Poor management of fluid restriction can cause high interdialytic weight gain (IWG), resulting in increased cardiovascular mortality and morbidity (Theofilou, 2013). The National Kidney Foundation has stipulated five methods to promote compliance with fluid limitations, including engaging in fluid intake calculations, providing specific education / individual fluid prescriptions, managing thirst, limiting excessive sodium intake, and administering dialysis regimens (Bs et al., 2017). Bossola et al. (2020) stated that strategies to reduce thirst on patient with chronic hemodialysis, consist of reduction of dietary salt intake, improvement of xerostomia, use of low dialysate sodium concentration, drugs that target angiotensin II, and other treatments (drinking cold water or dissolving ice chips in mouth may alleviate thirst). The challenges with hemodialysis diet management are usually observed in low self-efficacy in sodium restrictions (Clark-Cutaia et al., 2014).

Therefore, patients in this current study made several arrangements to manage fluid intake and ensured a healthy diet. These include some activities to reduce thirst, control diet and play an essential role in facilitating survival. Also, the possible complication of excess fluid, such as edema is reduced. All participants set a drinking schedule (after eating and while taking tablets) and apply temperature modification to drinks/food (warm or cold water, ice, eating frozen fruit). The participants also prepared individual diets according to the kidney demands by avoiding foods rich in potassium, high salt content and encouraging multivitamin consumption. These dietary plans instruct patients to regulate fruits, vegetables, legumes, dairy products, and whole grains due to the possibility of developing phosphorus and potassium-related problems (Biruete et al., 2017). Furthermore, some participants adopted distraction techniques, including the act of fasting between days of dialysis. As observed during the fasting month (Ramadan), dietary patterns and content changes are safe in electrolyte balance, and blood pressure changes for hemodialysis patients (Imtiaz et al., 2016).

4.3 Inadequate information

Some participants reported doctor's or nurse's inability to provide clear information on the fluid prescription or the exact consumable amount per day. Previous research has also shown the unmet communication needs between service providers and patients and interprofessional (Hall et al., 2020). Also, there have been arguments on some seemingly contradictory information provided by the nutritionists and nurses. There have also been complaints about low consistency in the nutritional information delivered by various nutritionists in health facilities. This leaves most respondents confused and ultimately decides to ignore or triangulate the advice with knowledge obtained from fellow patients to identify the best foods (Okoyo Opiyo

et al., 2020). Kelly (2018) also highlighted some of the factors implicated in the diet failure of chronic kidney disease patients, including stagnated diet management due to excessive advice, the unpreparedness of patients towards these changes, and barriers to access diet-related services. It is also essential for nurses and other health care workers to identify strategies required to improve communication by strengthening fluid/dietary counseling activities for patients and family members. This helps in facilitating adherence to medication regimens and fluid/nutritional guidelines (Beerendrakumar et al., 2018).

4.4 The support system

The majority participants said that they got support from family, peer, and professional advice. Some of them said that their source of strength from family, includes support and caring from husband/wife, and their children. The support obtained from family, friends, and dialysis staff is a significant factor in promoting acceptance and adherence (Stevenson et al., 2018). These are the core backings estimated to promote adaptation behaviors (Cho & Shin, 2016) due to emotional and physical encouragement. The support is provided by ensuring the appropriate food is available, consistently reminding the patient to limit fluid intake, and verifying the adherence to the recommended diet. The previous study showed that peer support programs improved self-management in patients with CKD undergoing hemodialysis. Peer support programs should be offered early to individuals undergoing hemodialysis so that they can learn about self-management from other patients (Husain et al., 2020). The dialysis staff also plays an essential role by emphasizing the need for fluid limitation at each hemodialysis session. Several other strategies have been adopted to provide mental support and sustain positive attitudes towards the diet and fluid restrictions and modifications. The phenomenological research by Shahgholian & Yousei (2018) recognized patient's dislike for others' pity. They hoped for a change in the attitude of people through the provision of support and assistance.

All participants in this study came from the Minangkabau ethnicity. In the Minangkabau population, animal protein sources as well as saturated fat, and palm oil due to the traditional heritage of food processing, are quite high (Lipoeto et al., 2004). According to the Indonesia's total dietary survey data, the Minangkabau population consumes an average of 50.4 g of fat daily in oil, fried foods, coconut and coconut oil, and less than 100 g of vegetables and fruits per day (Indonesia National Intitute of Health Research and Development, 2014). The results of a study showed that consuming a poor quality diet was consistently associated with increased risk factors associated with chronic disease (Estruch et al., 2018). Renal dietary prescription can vary substantially among patients depending on age, comorbidities, and treatment goals (Kalantar-zadeh et al., 2016). Changing eating patterns and restricting diet and fluids is not easy for CKD patients. However, the diet is considered more burdensome and challenging for patients who need to change some diet components (e.g., sodium, fluids, potassium, and phosphate) and those who come from culturally and linguistically diverse backgrounds (Stevenson et al., 2018). Patients expressed some frustration that the nutritional information and resources they received were not culturally relevant, and they did not know how to integrate dietary recommendations into their diet. Strong influence from family and friends on patients' dietary beliefs and habits is well known. Patients describe the emotional and physical support that they receive from family and friends who assist with food preparation, meal preparation and act as reminders and reinforcement for patients to adhere to their dietary and fluid restrictions (Walker et al., 2012).

5. Implications and limitations

The results of this research have important implications for health professionals working in the hemodialysis units to serve as an input for further research about strategies how to reduce thirst. The findings are applicable as inputs for dialysis staffs to evaluate and improve the hemodialysis units' information dissemination system. Furthermore, individual approaches and structured education implementation are very crucial.

The study has some limitations. First, the choice of interview time and place was during the hemodialysis process or while in the hospital waiting room. Participants selected during the treatment time, approximately 30 minutes after the commencement of the hemodialysis, may have affected how the participants answered the questions since the room was too wide and participants did not have privacy. During the interview process, the interviews were sometimes

interrupted by the arrival of a doctor or nurse to carry out an examination. Second, the principal researcher, who is novice, may impact how deep the interview was conducted and how to analyze the data forming the themes. However, to ensure the data quality, all participants were subjected to member checks and peer debriefings with more experienced researchers in data processing.

6. Conclusion

The research results showed the severe suffering and sadness experienced by chronic kidney disease patients in hemodialysis who conform to fluid restrictions. In addition, adequate compliance is required for survival and also to improve the quality of life. Moreover, some of the challenges implicated in poor adherence include unspecific and inaccurate education and information delivery. This instills confusion and further prompts the individuals to make personal decisions regarding the amount of diet consumed. Therefore, this study recommends nurses to provide clear information on the fluid prescription or the exact consumable amount per day. Also, the respondents' engagement in numerous unique activities to overcoming thirst, and further research are needed with an emphasis on individual experiences. The support obtained from family, friends, and dialysis staff is a significant factor in promoting acceptance and adherence. So, it is essential for nurses and other health care workers to identify strategies required to improve communication by strengthening fluid/dietary counseling activities for patients and family members. This helps in facilitating adherence to medication regimens and fluid/ nutritional guidelines. Furthermore, it is essential to modify structured education with a personal approach to ensure detailed information regarding "fluid prescribing".

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Author contribution

All authors contributed to the study conception and design (FM, RM, YH), data collection (FM, RM), data analysis (FM, RM, YH), and manuscript preparation and revision (FM, EH, CMC, KLA).

Conflict of interest

The authors declare no potential conflict of interest concerning this research, authorship, and/or publications of this article.

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ORIGINAL RESEARCH

Factors Influencing Depression among Indonesians during the COVID-19 Outbreak

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Abstract

Background: The 2019 Coronavirus pneumonia disease (COVID-19) has gained intense attention globally, including in Indonesia. The rapid transmission and clinical effects of the virus can cause depression in Indonesian society. However, information on risk factors for depression during COVID-19 in this country is not known.
Purpose: This study aimed to determine the level of depression and identify factors influencing depression in Indonesian society during the COVID-19 outbreak.
Methods: An online-based cross-sectional study was conducted among Indonesian society aged ≥12 years old in April 2020. A total of 1,622 participants from 34 provinces in Indonesia were involved in this study and completed the online questionnaires on demographics, social media exposure, self-rated health, and depression levels with the WHO-Five Well-being Index (WHO-5). Ordinal logistic regression analysis was used to identify the factors associated with depression levels.
Results: Of the total sample analyzed, the overall prevalence of depression levels was 28.5% mild depression, 18.4% moderate depression, and 24.8% severe depression. Social media exposure (SME), age, gender, occupation, and self-rated health (SRH) were significantly influencing depression (p<0.05). The factor that most influenced the level of depression was self-rated health (p=0.0001; OR=2.72).
Conclusion: This study highlights depression in Indonesian society during the COVID-19 pandemic and provides an understanding of the effects of demographics, social media exposure, and self-rated health. The study suggests the importance of implementing a multi-disciplinary approach (e.g., a collaboration between mental health nursing and community nursing) to deal with depression.

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1. Introduction

The 2019 Coronavirus pneumonia disease (COVID-19) has gained intense attention globally, including in Indonesia (Mailani et al., 2021). In early March 2020, this virus had spread to Indonesia. As of June 4, 2020, Indonesia became the 33rd country in the world with the highest number of COVID-19 cases. Until February 3, 2021, Indonesia already ranks 19th globally to have the number of confirmed cases (1,111,671) (Worldometer, 2020). The rapid spread of the virus and the clinical effect have caused panic and mental health problems in society (Zhou, 2020). A large amount of information about the COVID-19 outbreak on social media also triggered this alarm (Ahmed et al., 2020).

Depression is the most common mental health problem in the society during the COVID-19 outbreak. Based on previous research, the prevalence of depression in the society remains high, such as a study in China reported by Gao et al. (2020) showed that around 48.3% of people experienced depression, 22.6% had anxiety, and 19.4% experienced a combination of depression and anxiety. Another study has also shown that the prevalence of depression, as a mental health problem, was 50.7%, while anxiety, insomnia, and other symptoms associated with stress were 44.7%, 36.1%, and 73.4%, respectively (Liu et al., 2020). Furthermore, 16.5% of people in China report moderate to severe symptoms of depression (Wang et al., 2020a).

There are many factors that can influence depression. According to the previous study conducted by Vacaru et al. (2021) in The Netherlands, education and marital status are factors

associated with depression. Scarlett et al., (2021) in France explained that the factors associated with depression symptoms are gender, age, partnership status, chronic disease, food insecurity, region of origin, administrative status, and lack of safety. Wang et al. (2020a) in China revealed that gender, employment status, and education are associated with depression during the initial stage of the COVID-19 epidemic among the general population. Meanwhile, a study conducted by Hosen et al. (2021) in India revealed that marital status was the only characteristic associated with the depression in Indian society during the COVID-19 pandemic.

In Indonesia, the prevalence of psychological problems in the general population during the COVID-19 epidemic was relatively high at 69%, and depression at 67% (PDSKJI, 2020). In turn, this psychological distress can result in dangers that outweigh the consequences of the COVID-19 epidemic itself (Bao et al., 2020). However, information on risk factors for depression in this country is not known. Indonesia is a multiethnic country, and currently, the exposure to social media is very high. So, the level of depression during the COVID-19 epidemic and factors influencing these constructs among Indonesian need to be explored. This study aimed to determine the level of depression and identify factors influencing depression among Indonesian.

2. Methods

2.1 Research design

This study used a cross-sectional design using anonymous online questionnaires.

2.2 Setting and samples

This study was conducted in April 2020. Online questionnaires were distributed to Indonesians aged ≥12 years old using social media platforms such as WhatsApp, Facebook, and Instagram. A snowball sampling technique was employed. We distributed the first survey through student groups, and encouraged each student to continue the survey on social media. This online survey was entirely voluntary and not for commercial purposes. A total of 1,622 respondents took this survey and completed all the questions in the study.

2.3 Measurement and data collection

WHO (Five) Well-Being Index to assess depression (Psychiatric Research Unit, 1998) were used, which consists of five items with positive words reflecting the presence or absence of well-being rather than symptomatology depression. Participants were asked to report the presence of these positive feelings in the past two weeks on a 6-point scale ranging from all-time (5 points) to no time (0 points). The severity of depression is indicated by the number of scores generated; the higher the score indicates the higher depression. Total scores range from 0 to 25. Since "most of the time" and "more than half the time" are thought to mean similar things, we changed this scale to "never" for "a short time", "rarely" for "occasionally", "sometimes" for "less than half the time", "often" for "most of the time and more than half of the time", and "always" for "all the time." Given that no cut-off score has been established in the literature, we divided the possible range of WHO-5 total scores (0-20) into percentiles to provide upper and lower extreme responses with the middle group. Scores ≤11 mean severe depression, 12-13 mean moderate depression, 14-15 mean mild depression, and ≥16 mean minimal or no depression. This instrument has been translated into the Indonesian language using the language service at the Language Center of Universitas Andalas. Validity and reliability tests were carried out on 30 people who had the same inclusion criteria as respondents, namely, those aged ≥12 years old and had access to open the instrument online. This instrument has good internal consistency with a Cronbach's alpha of 0.864.

Previous research has shown that demographic factors such as gender, age, education, marital status, occupation, area of residence (urban or rural), and self-rated health background influence mental health outcomes. However, this relationship varies by place of residence (Gao et al., 2020). For this reason, we provided information on age, gender, religion, education level, marital status, occupation, province, and area of residence of the participants. We also provided information on participants' levels of exposure to information about COVID-19 on social media (less, sometimes, frequently), self-rated health (healthy or good, unwell or sick or not good), and the participant's exposure history with COVID-19 patients (categorized as "ever" and "never").

Participants provided informed consent in the first part of the questionnaire package before filling out the online-based questionnaire via the Google platform during the 11-27 April 2020 period. Teenage participants (aged 12-19) could participate after obtaining consent from the

guardian and ticking agree option on the consent page. All participants were informed about the study objectives, nature, and administrative procedures. A total of 1,622 participants from 34 provinces in Indonesia participated in this survey voluntarily. All participants reported demographic data, social media exposure, self-rated health, and the WHO-5 well-being index. Participants can withdraw from the study at any time without providing any reason. In this study, all participants completed the instrument and no participants withdraw.

2.4 Data analysis

Chi-square tests were used to examine associations between social media exposure, self-rated health, history of exposure to COVID-19, and participant characteristics with levels of depression. Ordinal logistic regression analysis was used to examine the factors associated with depression levels. All analyzes used IBM SPSS 24. Inferences were drawn at a significance level of <0.05.

2.5 Ethical considerations

The Research Ethics Committee of the Faculty of Medicine, Universitas Andalas, Indonesia (reference number 280/KEP/FK/2020) has approved this research.

3. Results

3.1 Characteristics of the respondents and relation with social media exposure

Table 1 provides an overview of participants' characteristics and their relationship with social media exposure. Overall, most participants (78.7%) had frequently exposed to social media, 75.5% were female, 61.3% were aged ≤25 years old, 51.5% had graduated from high school, 52.1% were still students, 67.3% were unmarried, 96.7% were Muslim, 66.7% live in urban areas, 95.7% reported good self-rated health, and 97.8% never had a history of exposure to cases. Social media exposure was related to age, education level, marital status, occupation, and self-rated health (all p<0.05).

Table 1. Characteristics of participants and relation with social media exposure (n=1,622)

Characteristics	f (%)	Social media exposure			*p*-value
		Less f (%)	Sometimes f (%)	Frequently f (%)	
Overall	1622 (100)	60 (3.7)	286 (17.6)	1276 (78.7)	
Gender					
Male	398 (24.5)	18 (4.5)	74 (18.6)	306 (76.9)	0.483
Female	1224 (75.5)	42 (3.4)	212 (17.3)	970 (79.2)	
Age (years)					
≤25 (younger)	994 (61.3)	40 (4.0)	196 (19.7)	758 (76.3)	0.016
26-45 (adults)	540 (33.3)	18 (3.3)	83 (15.4)	439 (81.3)	
≥46 (elderly)	88 (5.4)	2 (2.3)	7 (8.0)	79 (89.9)	
Religion					
Muslim	1569 (96.7)	58 (3.7)	271 (17.3)	1240 (79.0)	0.114
Non-Muslim	53 (3.3)	2 (3.8)	15 (28.3)	36 (67.9)	
Education level					
Middle school	835 (51.5)	38 (4.5)	164 (19.6)	634 (75.8)	0.011
College	787 (48.5)	22 (2.8)	122 (15.5)	642 (82.7)	
Marital status					
Married	531 (32.7)	13 (2.4)	72 (13.6)	446 (84.0)	0.001
Unmarried	1091 (67.3)	47 (4.3)	214 (19.6)	830 (76.1)	
Occupation					
Government employees	329 (20.3)	4 (1.2)	40 (12.2)	285 (86.6)	0.006
Private employees	178 (11.0)	10 (5.6)	33 (18.5)	135 (75.8)	
Housewives	85 (5.2)	4 (4.7)	14 (16.5)	67 (78.8)	
Students	842 (51.9)	34 (4.0)	159 (18.9)	649 (77.1)	
Others	188 (11.6)	8 (4.3)	40 (21.3)	140 (74.5)	
Region of residence					
Sumatera	1301 (80.2)	46 (3.5)	219 (16.8)	1036 (79.6)	0.307
Java	267 (16.5)	13 (4.9)	55 (20.6)	199 (74.5)	
Others	54 (3.3)	1 (1.9)	12 (22.2)	41 (75.9)	

Table 1. Continued

Characteristics	f (%)	Social media exposure			*p*-value
		Less f (%)	Sometimes f (%)	Frequently f (%)	
Area					
Urban	1082 (66.7)	36 (3.3)	192 (17.7)	854 (78.9)	0.531
Rural	540 (33.3)	24 (4.4)	94 (17.4)	422 (78.1)	
Self-rated health					
Good	1553 (95.7)	57 (3.7)	266 (17.1)	1230 (79.2)	0.036
Not good	69 (4.3)	3 (4.3)	20 (29.0)	46 (66.7)	
History of exposure to cases					
Ever	35 (2.2)	3 (8.6)	7 (20.0)	25 (71.4)	0.266
Never	1587 (97.8)	57 (3.6)	279 (17.6)	1251 (78.8)	

Note: p< 0.05. Abbreviation: SME = Social Media Exposure, SRH = Self-Rated Health

3.2 Depression levels

Table 2. Depression levels (n=1,622)

Characteristic	f (%)	Depression				*p*-value
		None f (%)	Mild f (%)	Moderate f (%)	Severe f (%)	
Overall depression levels	1622 (100)	459 (28.3)	462 (28.5)	299 (18.4)	402 (24.8)	
SME						
Less	60 (3.7)	25 (41.7)	17 (28.3)	9 (15.0)	9 (15.0)	0.0001
Sometimes	286 (17.6)	65 (22.7)	60 (21.3)	55 (18.9)	106 (37.1)	
Frequently	1276 (78.7)	369 (28.9)	385 (30.2)	235 (18.4)	287 (22.5)	
Gender						
Male	398 (24.5)	131 (32.9)	126 (31.7)	52 (13.1)	89 (22.4)	0.002
Female	1224 (75.5)	328 (26.8)	337 (27.5)	246 (20.1)	313 (25.6)	
Age (Years)						
≤25 (younger)	994 (61.3)	238 (23.9)	249 (25.1)	207 (20.8)	300 (30.2)	0.0001
26-45 (adults)	540 (33.3)	191 (35.4)	171 (31.7)	85 (15.7)	93 (17.2)	
≥46 (elderly)	88 (5.4)	30 (34.1)	42 (47.7)	7 (8.0)	9 (10.2)	
Religion						
Muslim	1569 (96.7)	442 (28.2)	445 (28.4)	291 (18.5)	391 (24.9)	0.574
Non-Muslim	53 (3.3)	17 (32.1)	18 (34.0)	7 (13.2)	11 (20.8)	
Education						
Middle school	835 (51.5)	199 (23.8)	204 (24.4)	176 (21.1)	256 (30.7)	0.0001
College	787 (48.5)	260 (33.0)	258 (32.8)	123 (15.6)	146 (18.6)	
Marital status						
Married	530 (33.1)	187 (35.2)	183 (34.5)	77 (14.5)	84 (15.8)	0.0001
No married	1072 (66.9)	272 (24.9)	279 (25.6)	222 (20.3)	318 (29.1)	
Occupation						
Government employees	329 (20.3)	112 (34.0)	116 (35.3)	49 (14.9)	52 (15.8)	0.0001
Private employees	178 (11.0)	58 (32.6)	57 (32.0)	34 (19.1)	29 (16.3)	
Housewives	85 (5.2)	21 (24.7)	26 (30.6)	20 (23.5)	18 (21.2)	
Students	842 (51.9)	202 (24.0)	214 (25.4)	173 (20.5)	253 (30.0)	
Others	188 (11.6)	66 (35.1)	49 (26.1)	23 (12.2)	50 (26.6)	
Region of residence						
Sumatera	1301 (80.2)	366 (28.1)	367 (28.2)	236 (18.1)	332 (25.5)	0.460
Java	267 (16.5)	76 (28.5)	76 (28.5)	56 (21.0)	59 (22.1)	
Others	54 (3.3)	17 (31.5)	20 (37.0)	6 (11.1)	11 (20.4)	
Area						
Urban	1082 (66.7)	304 (28.1)	320 (29.6)	199 (18.4)	259 (23.9)	0.533
Rural	540 (33.3)	155 (28.7)	143 (26.5)	99 (18.3)	143 (26.5)	
SRH						
Good	1553 (95.7)	451 (29.0)	447 (28.8)	285 (18.4)	370 (23.8)	0.0001
Not good	69 (4.3)	8 (11.6)	15 (21.7)	14 (20.3)	32 (46.4)	
Exposure to cases						
Ever	35 (2.2)	10 (28.6)	11 (31.4)	5 (14.3)	9 (25.7)	0.931
Never	1587 (97.8)	449 (28.3)	452 (28.5)	293 (18.5)	393 (24.8)	

Note: p<0.05. Abbreviation: SME = Social Media Exposure, SRH = Self-Rated Health

Table 2 shows a description of the depression levels of the respondents and bivariate analysis results using the chi-square test. Most respondents (71.7%) experienced depression during the COVID-19 outbreak. Respondents reporting symptoms of mild depression were 28.5%, moderate depression were 18.4%, and severe depression were 24.8%. Social media exposure (SME), gender, age, education, marital status, occupation, and self-rated health (SRH) were related significantly to depression (p<0.05, respectively).

3.3 Factors influencing depression

Table 3 presents the results of multivariate analysis using the ordinal logistic regression test. The results showed that the factors influencing depression in Indonesian society are SME, gender, SRH, age, and education (p<0.05, respectively). Meanwhile, marital status and employment did not influence depression statistically (p>0.05, respectively). Of these five factors, self-rated health is considered the most influencing factor in respondents' depression levels (OR=2.72). Every 1% increase in the feeling body in good health, will reduce depression by 2.72 times. In other words, respondents who rated themselves in poor health tended to feel more depressed 2.72 times during the COVID-19 outbreak than respondents who rated themselves as healthy. The calculation of the coefficient of determination obtained a value of 0.74. It means the variables SME, gender, SRH, age, and education can explain the depression variable by 74%.

Table 3. Ordinal logistic regression for predicting the factors influencing depression

Predictor	Categories	Step 1			Step 2			Step 3			OR
		Estimate	Wald	*p*	Estimate	Wald	*p*	Estimate	Wald	*p*	
Depression (Y)	None (Y1)	-1.517	16.929	0.0001	-1.273	14.345	0.0001	-1.370	20.553	0.0001	
	Mild (Y2)	-0.244	0.440	0.507	-0.001	0.000	0.998	-0.100	0.111	0.739	
	Moderate (Y3)	0.648	3.103	0.078	0.889	7.018	0.008	0.789	6.866	0.009	
SME (X1)	Less (X1a)	-0.620	6.430	0.011	-0.606	6.167	0.013	-0.602	6.101	0.014	1.64
	Sometimes (X1b)	0.500	17.386	0.0001	0.505	17.753	0.0001	0.506	17.939	0.0001	1.38
Gender (X2)	Male (X2)	-0.233	4.689	0.030	-0.232	4.623	0.032	-0.266	6.368	0.012	0.72
SRH (X3)	Good (X3)	-0.997	18.585	0.0001	-0.989	18.325	0.0001	-1.000	18.731	0.0001	2.72
Age (X4)	Younger (X4a)	0.474	2.785	0.095	0.698	7.884	0.005	0.629	7.897	0.005	1.71
	Adults (X4b)	0.122	0.327	0.567	0.157	0.545	0.460	0.177	0.705	0.401	0.48
Education (X5)	Middle school (X5)	0.269	3.569	0.059	-0.267	3.520	0.061	0.267	4.552	0.033	0.73
Occupation (X6)	Government employees (X6a)	0.123	0.445	0.505	0.069	0.144	0.704				
	Private employees (X6b)	0.042	0.046	0.830	0.040	0.043	0.836				
	Housewife (X6c)	0.504	3.745	0.053	0.400	2.525	0.112				
	Students (X6d)	-0.002	0.000	0.991	0.008	0.002	0.965				
MS (X5)	Married (X5)	-0.297	2.568	0.108							
Pseudo R^2			0.077			0.076			0.074		
p			0.014			0.007			0.005		

Note: p< 0.05. Abbreviation: SME = Social Media Exposure, MS = Marital Status, SRH = Self-Rated Health

4. Discussion

This study aimed to determine the level of depression and identify factors influencing depression in Indonesian society during the COVID-19 outbreak. Based on the level of depression, most Indonesians in this study (71.7%) experienced symptoms of depression during the COVID-19 outbreak, the others experienced mild depression (28.5%), moderate depression (18.4%), and severe depression (24.8%). This prevalence is higher than that in a previous study conducted by Scarlett et al. (2021) in France on people living in shelters, namely, 28% had mild depression, 17% had moderate depression, 10% had moderately severe depression, and 3% had severe depression. This high rate of depression may be due to unclear information about COVID-19. The data were taken after six weeks from the first case that appeared in Indonesia. Large-scale distance limitation regulations make people feel isolated and carry out all activities from home that make the body lack sunlight, thereby reducing serotonin levels that lead to emotional disorders, such as depression (Huang & Zhao, 2020). The quarantine condition is also associated with feelings of loneliness from being separated from others, feelings of guilt, fear, and helplessness (Brooks et al., 2020). Besides that, the number of deaths due to COVID-19 in Indonesia is the highest in Asia (Indonesia's COVID-19 Task Force, 2020). Thus, people's fear is very natural when they see high rates of infection and death. News reports about the number of deaths each day are informed

through mass media. According to Ahmed (2020), there is a correlation between higher death rates with higher levels of depression during outbreaks COVID-19.

This study results found that of the ten factors examining depression, seven factors had a significant correlation with depression (SME, gender, age, education, marital status, occupation, and SRH). SRH is considered to be the most influencing factor in respondents' depression levels. Respondents who rated themselves in poor health tended to feel more depressed 2.72 times during the COVID-19 outbreak than those who rated themselves as healthy. This result is in line with a previous study that poor or feeble self-rated health is significantly associated with higher levels of stress, anxiety, and depression than those whose health was rated as good or very good during the COVID-19 outbreak (Wang et al., 2020a). Beck's (1967) cognitive theory states that depression arises from malfunctioning information processing due to distorted thinking. This theory states that people who adopt negative thinking have a higher risk of developing depression when faced with stressful or disappointing life experiences. In the face of new life stressors, these schemes are activated and generated automatically and false-negative thoughts about oneself, the environment, and the future (Weeland et al., 2017).

This study found that 78.7% of respondents had accessed information related to COVID-19 through social media, and about 22.5% of respondents admitted to experiencing severe depression symptoms. Social media such as television programs are ineffective in eliminating panic and depression when information related to COVID-19 was disseminated through talkshows that do not use legitimate sources, such as medical experts. Sometimes social media are also used in political propaganda. Information regarding COVID-19 was discussed by senior journalists and politicians who did not touch on the essence of the COVID-19 outbreak but rather criticized the political aspects. This information does not raise public awareness about the COVID-19 outbreak (Bilal et al., 2020).

This study also found that women experienced more moderate and severe depression. Meanwhile, men experience mild depression or even minimal depression. Women are three times more likely to experience depression than men (Wang et al., 2020a). Previous research in Italy also confirmed that most female respondents experience depression from average to very high during the COVID-19 outbreak (Mazza et al., 2020). Biologically, depression occurs in women due to fluctuations in the hormone estrogen. In men, it appears that androgen receptors can provide protection, for example, in the hippocampus associated with depression. Differences in regulating the hormone estrogen in the male and female brains are also factors in causing gender differences in depression (Albert, 2015). Besides, choosing a coping strategy can also be a predictor of depression. Women tend to react to stressors by blaming themselves and reframing less positively (lack of ability to see situations from a different perspective) than men. Emotion-focused coping was also more likely to be chosen by women as a coping strategy than men who used problem-focused coping more frequently, making them more vulnerable (Kelly et al., 2008).

The results of this study also indicated that adults (26-45 years) and adolescents (≤25 years) were more likely to be diagnosed with moderate and severe depression than those with old age (≥46 years). The higher percentage of depression in young adults may be due to this age being the productive age, making them have to leave the house to work and allow contact with public places, so there is concern about infection (Mazza et al., 2020). Also, at this age, people tend to use social media frequently so that they are more exposed to COVID-19 (Wang et al., 2020b). It was closely related to the incidence of depression in young adults (Lin et al., 2016).

Our findings also found that respondents with a lower education background tend to experience more depression than respondents with higher education. These results differ from previous studies in Italy, which did not find an association between educational background and depressive symptoms (Mazza et al., 2020). Meanwhile, a study in China showed the opposite; psychological distress occurred more in people with higher education, which may be because they have a heightened self-awareness of their health (Qiu et al., 2020). Our results show that people with higher education have less depression than those with lower education, even though they are more exposed to news about COVID-19 on social media. According to Stewart et al. (2004), education is the initial capital in cognitive development, where cognitive can be a mediator between an event and mood (Stewart et al., 2004). Thus, people with low levels of education have less cognitive abilities in accepting an event, so they are more prone to depression. Meanwhile, people with higher education have better cognitive skills and self-efficacy in receiving

information, which helps them form healthier coping strategies in overcoming problems (Bauldry, 2015).

Respondents who were married tend to be higher depressed than those who are not married. These results contrast with a previous study on depression during COVID-19 in several countries that did not show a relationship between marital status and the incidence of depression (Özdin & Özdin, 2020). This difference might be due to the relationship between marital status and depression and is influenced by age and gender variables. As explained earlier, depression is lower in female respondents who were single, widowed, or separated than married. Still, the risk of depression increased with age in single respondents and a common-law relationship. Unmarried respondents usually have broader relationships, so they have more support systems, while married couples consider their partners as the primary support system.

Homemakers and students tend to be more depressed than the government and private employees during the COVID-19 pandemic. Around 52.1% of respondents in this study were students and detected around 29.9% have severe depression. This may be due to concerns over schools' closure, making students feel uncertain and worried about the negative impact of their academic progress. Besides that, no more extended access to school facilities such as mental health support, peer-group support, and face-to-face services (Lee, 2020). Besides, students still seem immature and lack of resources to face the pandemic (González-Sanguino et al., 2020). Depression associated with work as a housewife appears to be caused by housewife having to assume the role of primary caregiver for their family and balancing household work during the COVID-19 pandemic. This stress may be influenced by financial independence, social status, and life satisfaction, which is more felt by working women and causes better stress tolerance and adjustment than those who do not work. Respondents with erratic jobs, such as daily workers, reported severe depression symptoms. During the "stay at home" policy, daily workers and traders do not have the regular income, resulting in material hardship in meeting their daily needs and paying bills, which creates a depressed feeling. This finding in line with a previous study that material hardship is positively associated with an elevated risk for depression (Heflin & Iceland, 2009). In other words, depression in the community because of the COVID-19 outbreak problem and the material hardship of the COVID-19 outbreak effect can also directly affect depression in the community.

5. Implications and limitations

This study has implications for nursing and health policy to maintain the mental health of Indonesian society during the COVID-19. Understanding the factors influencing depression among Indonesian during the COVID-19 means that implementing a multidisciplinary and multi-faceted approach is essential. For example, a collaboration between mental health nursing and community nursing, forming multidisciplinary mental health teams that provide community-based mental health services, using online counseling platforms, and screening mental health especially in susceptible groups, are necessary.

This study has limitations that warrant attention when interpreting and using the results. First, establishing a causal relationship between key variables may not be possible considering the cross-sectional research design of the study. Second, the research was conducted online, which is suitable for rapid assessment during an outbreak. However, representativeness cannot be guaranteed such as were mostly young adult age groups, which may have influenced the results.

6. Conclusion

In conclusion, our findings found that most Indonesians had symptoms of depression during the COVID-19 outbreak. This study showed that the pandemic had a more significant depressive effect on women, homemakers, frequent social media exposure, young adults, and poor self-rated health. Therefore, it is essential to consider the characteristics of this group in developing interventions. Also, psychological counseling telephone lines are open to the public and are rapidly becoming a necessary mechanism for dealing with psychological problems. Collaboration between mental health nurses and community nurses may help educate the public to use media wisely. Interventions such as forming a multidisciplinary mental health team, using online counseling platforms, and mental health checks, especially for vulnerable groups, may need to be implemented immediately to prevent further psychological effects. Also, further research is needed to explore what kind of interventions are needed to reduce depression in the community.

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Author contribution

All authors were involved sufficiently in the concept, design, data analysis, writing, and revision of the manuscript.

Conflict of interest

The authors declare no conflicts of interest.

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ORIGINAL RESEARCH

The Association of Work Environments and Nurse-Nurse Collaboration: A Multicenter Cross-Sectional Study

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Abstract

Background: Along with the recent healthcare reform, intraprofessional collaboration in nursing is considered an essential factor for managing the challenges related to diverse roles and tasks of nurses in providing high quality care. There is lack of knowledge on how the nursing work environment could influence nurse-nurse collaboration.
Purpose: The study aimed to assess the relationship between nursing work environment and nurses' intraprofessional collaboration.
Methods: A total of 300 nurses working in four teaching hospitals participated in this multicenter cross-sectional study. Data were collected using the Nurse-Nurse Collaboration Scale (NNCS) and the Practice Environment Scale of the Nursing Work Index (PES–NWI). The Pearson correlation test was used to analyze the data.
Results: The results showed that the mean score of the PES–NWI was 2.65±0.32 out of 4. The highest and lowest scores belonged to the subscales of the nursing foundations for quality of care (2.86±0.31) and staffing and resource adequacy (2.24±0.49), respectively. The mean total score of nurse-nurse collaboration was 2.94±0.21 out of a score of 4. The results showed a significant positive relationship between nursing work environment and nurses' intraprofessional collaboration ($r=0.49$, $p<0.05$).
Conclusion: The nursing practice environment has a positive and significant relationship with nurse-nurse collaboration. Therefore, improving nurses' practice environment and providing healthy workplaces could improve the intraprofessional nurse's collaboration. Moreover, nurse managers should improve nurses' skills in some areas of collaboration such as conflict management.

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1. Introduction

Nurses are the largest number of health care professionals and have more contacts with patients than other health care providers (Zamanzadeh et al., 2018). To improve the quality of services to patients and their families within the health care settings, nurses should work collaboratively. Although there are different definitions for the concept of collaboration, one of the most comprehensive definitions is the one stating that collaboration is a dynamic, interactive and reciprocal process among team members to achieve common goals based on mutual respect, trust, responsibility, effort, and helps (O'Leary et al., 2011; Pakpour et al., 2019). Nurse-nurse collaboration needs sharing of information, values, and patients' care plans among nurses and making efforts for a common goal of improving patient outcomes and care quality (Lemetti et al., 2017; Ma et al., 2018).

An increasing number of patients with multiple and complex illnesses, advancement of technology and sophisticated equipment, and sharing information among professional members highlight the importance of nurse-nurse collaboration in health care systems (Di Prospero & Bhimji-Hewitt, 2011). Establishing effective communication is considered an important dimension of collaboration, so nurses should strengthen their communication skills and social interactions alongside their clinical skills to work collaboratively within workplace environment (Durmuş & Yıldırım, 2016).

The literature review shows that effective nurse-nurse collaboration could have positive outcomes for patients, organizations, and nurses (Piasecka et al., 2015; Prentice et al., 2020). In this regard, healthcare systems support the intraprofessional collaboration of nurses and collaboration of nurses with other health care professionals (interprofessional collaboration). These collaborations and team work could increase patients' safety, reduce nurses' burnout, and finally improve the quality of patient care (Pakpour et al., 2019; Lemetti et al., 2021). It has been found that building an environment that encourages nurses' collaboration can significantly influence nurses' performance (Al-Hamdan et al., 2021). Conversely, if a nurse does not collaborate with other nurses, it can lead to negative consequences such as medical errors, missed nursing care, increased job absenteeism, reduced job satisfaction, and increased nurses' turnover in the nursing profession (Aiken et al., 2012). Previous research has reported that poor interactions between nurses ultimately cause tension and stress among nurses. On the other hand, lack of collaboration and teamwork has been associated with compromised patient safety and patient care and reduced productivity, patient dissatisfaction, and medication errors (Stewart, 2018). Therefore, collaboration and teamwork in the nursing profession are recognized as essential elements of nursing practice and is a crucial factor to maintain effective and high-quality care (Gabriel et al., 2013).

Factors affecting collaboration are discussed at both individual and organizational levels. The factors such as individuals' desire for collaboration, willingness to achieve a common goal, showing mutual respect and trust for each other, and effective communication skills are considered individual factors (Rydenfält et al., 2012). Receiving support and feedback from colleagues and managers and the organizational culture of teamwork is considered the important organizational factor of teamwork in the practice setting (Tsai, 2011).

One of the factors that may affect nurse-nurse collaboration is the nursing practice environment (Gabriel et al., 2013). Nurses' clinical practice environment is a collection of information, resource allocation, the possibility of support establishment, an opportunity to learn, development and strengthening staffs' skills that enable nurses to work with a greater sense of collaboration and satisfaction (Sanjar et al., 2012). Improving the nursing practice environment is considered a practical strategy for recruiting and maintaining skilled nurses in clinical settings (Rivaz et al., 2020). According to the literature review, a favorable professional practice environment has been associated with less missed care, lower nurse burnout and job dissatisfaction, and high quality of care (Zeleníková et al., 2020). More recently, Mohammadzadeh et al. (2021) found that a positive nursing work environment increases nurses' career success.

The characteristics of each nursing practice environment are different from other contexts. Some practice environments improve morale and productivity, increase collaboration and job satisfaction, and improve nurses' self-esteem, leading to improved quality of care. Conversely, poor work environments could lead to dissatisfaction, frustration, and isolation among staff and can lead to an increase in emotional disorders such as depression, anxiety, and physical problems among health care providers (Choi et al., 2013).

The literature review shows that an unhealthy practice environment leads to an increase in medical errors, a decrease in the quality of care, conflict, and tension among health care providers leading to quality care deficits (Zeleníková et al., 2020). A systematic review showed that poor nursing workplace relationships affect nurses' psychological health, intensify their intent to leave, and decrease job performance and productivity (Wei et al., 2018). According to the literature review, there are many studies about the interprofessional collaboration between nurses and physicians (Galletta et al., 2016; Zhang et al., 2016), and less attention has been paid to intraprofessional collaboration of nurses (Dougherty & Larson, 2010; Liao et al., 2015). Meanwhile, recent studies emphasize the importance of nurses' intraprofessional collaboration for improving the quality of care and patients' safety and increasing nurses' job satisfaction (Chiarella et al., 2020; Al-Hamdan et al., 2021; Ylitörmänen et al., 2019). Although there are some studies in the field of nurses' collaboration, most of them have studied the outcomes of nurses' collaboration on patients. Another study has examined the effect on nurses' collaboration on nurses' outcomes such as job satisfaction and burnout (Ylitörmänen et al., 2019). Therefore, there is a paucity of literature on how the nursing work environment could influence nurse-nurse collaboration. Accordingly, this study aimed to assess the relationship between nursing work environment and intraprofessional collaboration among nurses.

2. Methods

2.1 Research design

This was a multicenter descriptive cross-sectional study that assessed the data from a population at one specific point in time. We followed the relevant guidelines (STROBE statement) for cross-sectional studies.

2.2 Setting and samples

This study was conducted in four teaching hospitals affiliated with Tabriz University of Medical Sciences, Iran. The sampling table proposed by Krejcie and Morgan (1970) was used to calculate sample size. The total nurse population of the hospitals was 1,060. Therefore, the sample size was calculated as 300 nurses by considering the formula with a confidence interval of 95%. A total of 300 nurses working in different fields of clinical settings were selected based on a stratified random sampling method. Based on the numbers of nurses in each hospital, the sample numbers were chosen from each hospital proportionally. The inclusion criteria were nurses having at least a bachelor's degree in nursing and direct working with patients in clinical settings. Nurses who were not engaged in direct nursing care were excluded from the study.

2.3 Measurement and data collection

Data were collected from March to May 2019. The relevant information on the objective of the study was provided to all participants; they were also asked to complete the questionnaires of the study. The questionnaires were distributed to the nurses by a main researcher. Data collection was performed by two main instruments. The Nurse-Nurse Collaboration Scale (NNCS) was used to measure nurse-nurse collaboration. This questionnaire was designed by Dougherty and Larson (2010) and has 35 questions. It includes five domains of conflict management (seven questions), communication (eight questions), shared process (eight questions), coordination (five questions), and professionalism (seven questions). The answers to each question are based on a four-point Likert scale of Strongly Disagree (1), Disagree (2), Agree (3), and Strongly Agree (4). On this scale, seven questions are scored in reverse. The range of score in each subscale and total scales varied from 1 to 4. A higher score indicates a higher level of nurse-nurse collaboration. The psychometric evaluation of this scale has been examined in a previous study reporting a Cronbach's alpha of 0.89 (Dougherty & Larson, 2010). The content validity was used for assuring of the Persian version of the Nurse-Nurse Collaboration Scale. For this purpose, after translating and back-translating the scale from English to Persian, the scale was given to ten nursing professors and they provided comments on the content of this tool. There was a high agreement on the scale and they commented on revising two items which was unclear in Persian language. The item content validity index (I-CVI) ranged from 0.80 to 1 and scale content validity index (S-CVI) ranged from 0.87 to 0.96, which indicated high content validity. The Cronbach's alpha coefficient of the Persian version of NNCS was 0.81.

The Practice Environment Scale of the Nursing Work Index (PES–NWI) was used to measure the nurses' practice environment. This scale was designed by Lake in 2002. It has 31 questions and includes five domains: the participation of nurses in hospital affairs (nine questions), the nursing foundations for quality of care (10 questions), the nurse manager ability, leadership and support of nurses (five questions), staffing and resource adequacy (four questions), and collegial relations between physician and nurse (three questions). The answer to each question is based on 4 options Likert scale including 1 (Strongly Disagree), 2 (Disagree), 3 (Agree), and 4 (Strongly Agree). The mean scores of items are calculated for each subscale. A higher score indicates a better practice environment. The validity and reliability of this tool have been assessed by Parker et al. (2010) and the Cronbach's alpha of more than 0.71 has been reported for each subscale. Moreover, in a study by Lake (2002), the Cronbach's alpha for each domain ranged from 0.85 to 0.95, indicating high reliability. The psychometrics evaluation of the Persian version of the PES–NWI tool has been performed by Elmi et al. (2013) with a Cronbach's alpha coefficient of 0.98. In our study, the Cronbach's alpha coefficient of the Persian version of NNCS was 0.91. Moreover, the demographic data, including age, gender, marital status, education, working time, work experience, and work units were collected by a demographic questionnaire.

2.4 Data analysis

Data analysis was done using SPSS (ver. 21) software using Pearson correlation coefficient. The normality assumption of data was checked by Kolmogorov-Smirnov test. The analysis showed that the data were normally distributed. The descriptive data were presented by the mean and standard deviation. A p-value <0.05 was considered as statistically significant.

2.5 Ethical considerations

The approval of the current study was obtained from the Ethical Board of Tabriz University of Medical Sciences (Ethical code: IR.TBZMED.REC.1397.850). Participation in the study was absolutely voluntary. The study's objectives were explained to the nurses and they entered the study after obtaining written informed consent from all the participants.

3. Results

3.1 Characteristics of the respondents

A total of 300 clinical nurses (with a mean age of 32.06±7.07 years) participated in the study. The majority of them (82%) were female. In terms of marital status, 71% of the samples were married. The majority of samples (97.7%) had a bachelor's degree. In the present study, 93% of the nurses participating in the study were working in rotating shifts (Table 1).

Table 1. Characteristics of the nurses (n=300)

Characteristics	Mean±SD	f	%
Age (years)	32.06±7.07		
Gender			
Female		246	82
Male		54	18
Marital status			
Single		86	28.7
Married		213	71
Divorced		1	0.3
Degree			
Baccalaureate		293	97.7
Master in nursing		7	2.3
Work experience in nursing (years)	8.53±6.84		
Work experience in the current unit (years)	4.82±4.22		
Main working time			
Fixed shift		21	7
Rotation shift		279	93
Work unit			
Emergency		35	11.7
Medical		66	22
Surgical		71	23.7
Critical care		128	42.7

3.2 The mean score of nurse-nurse collaboration

Based on the results, the mean total score of nurse-nurse collaboration was 2.94±0.21 out of 4. The results of our study showed that the highest scores of collaboration were related to professionalism (3.09±0.31), coordination (3.04±0.29), communication (2.96±0.32), shared process (2.82±0.34), and conflict management (2.82±0.26), respectively (Table 2).

3.3 The mean score of the Practice Environment Scale

The results showed that the mean score of the Practice Environment Scale of the Nursing Work Index was 2.65±0.32 out of 4. The highest score obtained in the subscale of the nursing foundations for quality of care subscale (2.86±0.31) and the lowest score belonged to the staffing and resource adequacy subscale (2.24±0.49) (Table 3).

Table 2. The level of nurse-nurse collaboration (n=300)

Domain	Mean±SD	Min-Max
Conflict management	2.82±0.26	2.14-3.57
Communication	2.96±0.32	1.63-4
Shared processes	2.82±0.34	1.75-4
Coordination	3.04±0.29	1.40-4
Professionalism	3.09±0.31	2-4
Total score	2.94±0.21	2-4

Table 3. Nurses view on nursing work index (n=300)

Domain (score range 1-4)	Mean±SD	Min-Max
Participation of nurses in hospital affairs	2.62±0.39	1-4
Nursing foundations for quality of care	2.86±0.31	1.70-4
The nurse manager ability, leadership, and support of nurses	2.46±0.43	1-4
Staffing and resource adequacy	2.42±0.49	1.25-4
Collegial nurse–physician relations	2.84±0.51	1.33-4
Total score	2.65±0.32	1.42-3.94

3.4 The relationship between nurses working index and nurse-nurse collaboration

Based on the results of this study, the mean total score of the PES-NWI scale had a positive and significant relationship with the mean total score of the nurse-nurse collaboration scale (r=0.49, $p<0.05$). Also, the results showed a positive relationship between each subscale of PES–NWI and the total score of nurse-nurse collaboration ($p<0.05$) (Table 4).

Table 4. The correlation between the mean score of the Nursing Practice Environment Scale and Nurse-Nurse Collaboration (n=300)

	Nurse participatioin hospital affairs	Nursing foundations for quality of care	Nurse manager ability, leadership, and support of nurses	Staffing and resource adequacy	Collegial nurse–physician relations	Total nursing work index
Conflict management	r=0.126 p=0.029*	r=0.169 p=0.003*	r=0.106 p=0.068	r=-0.006 p=0.916	r=0.054 p=0.355	r=0.127 p=0.028*
Communication	r=0.232 p=0.000*	r=0.165 p=0.004*	r=0.305 p=0.000*	r=0.112 p=0.053	r=0.261 p=0.000*	r=0.260 p=0.000*
Shared processes	r=0.282 p=0.000*	r=0.217 p=0.000*	r=0.375 p=0.000*	r=0.355 p=0.000*	r=0.162 p=0.005*	r=0.343 p=0.000*
Coordination	r=0.349 p=0.000*	r=0.318 p=0.000*	r=0.355 p=0.000*	r=0.358 p=0.000*	r=0.309 p=0.000*	r=0.415 p=0.000*
Professionalism	r=0.413 p=0.000*	r=0.382 p=0.000*	r=0.463 p=0.000*	r=0.487 p=0.000*	r=0.393 p=0.000*	r=0.522 p=0.000*
Total nurse-nurse collaboration	r=0.412 p=0.000*	r=0.360 p=0.000*	r=0.483 p=0.000*	r=0.389 p=0.000*	r=0.346 p=0.000*	r=0.491 p=0.000*

* Correlation is significant ($p<0.05$) using the Pearson correlation coefficient.

4. Discussion

This study assessed the association of nurses' intraprofessional collaboration and nurses' practice environment. Higher scores indicated higher nurse-nurse collaboration. The mean total score of nurses' collaboration was 2.94±0.21 out of a score of 4. In a study conducted by Lee and Hwang (2019) in Korea, the mean score of nurse-nurse collaboration was reported as 2.99±0.23, which is similar to this study. In another study done in Turkey by Durmus et al. (2018), nurses showed higher intraprofessional collaboration (3.09±0.39) compared to nurses in our study. This finding is not consistent with our results. It seems that this difference could be related to the context of the study in which some organizational and personal factors are different in the context of our hospitals compared with those studied in Turkey. As argued by Lemetti et al. (2021), nurses from different organizations could have different opinions on nurses' collaboration.

The results indicated that in terms of nurses' collaboration, the highest score was attributed to the field of professionalism and the lowest score was related to the field of conflict management. A study by Hassona and El-Aziz (2017) in Egypt which assessed the relationship between intensive care nurses' collaboration and missed nursing practice showed a higher mean score in the field of communication and a lower score in the field of coordination. These findings are not consistent with the results of our study. Ylitormanen et al. (2019) argue that collaboration as a dynamic and complex process could be influenced by some organizational and professional factors. Therefore, the difference in nurses' perceptions of collaboration in different countries can be attributed to the diversity of organizational factors and professional values in each country or context.

Regarding the nursing working environment, the mean score of the PES–NWI scale was 2.65±0.32 out of 4. The highest score belonged to the subscale of nursing foundations for quality of care and the lowest score belonged to the subscale of the staffing and resource adequacy (2.24±0.49). In a study conducted in Greece by Prezerakos et al. (2015), the results showed that the mean score of the Nurses' Practice Environment Scale (2.48±0.34) was lower than the results obtained from our study. In another study conducted in the USA, Flynn et al. (2010) assessed the effects of nurses' practice environment on the quality of care. The results showed that the mean score of nurses' practice environment was higher than our study. Moreover, Choi et al. (2013) investigated the association between the nursing practice environment and nurses' job satisfaction. The results showed that the mean score in all subscales, except the area of nurses' participation in hospital affairs, was higher than the results of our study. Therefore, it seems that the nursing practice environment differs according to the various context-based organizational factors such as organizational culture, management, leadership, and resources.

According to the results in this study, the lower scores were found in the subscale of resource adequacy and staffing and the leadership and nurse managers' support of nurses. Nantsupawat et al. (2017) argue that a poor practice environment such as lack of support from nursing managers and inadequate equipment could lead to nurses' burnout and poor quality nursing care. In a recent study, Lapeña et al. (2017) highlighted the importance of leadership in improving the nurses' work environment.

This study showed that the mean total score of the Practice Environment Scale of the Nursing Work Index has a positive and significant relationship with the mean total score of the nurse-nurse collaboration scale. Moreover, there was a significant positive relationship between each subscale of PES–NWI and the total score of nurse-nurse collaboration. It means that improvement in the nursing work index could increase the nurses' collaboration. Previous research has reported that working within better work environments could increase nurses' job satisfaction and decreases their intention to leave and burnout (Nantsupawat et al., 2017). More recently, Moisoglou et al. (2020) found a negative association of healthy work environment with nurses' personal, work-related and patient-related burnout.

To our knowledge, no studies focusing on the association of nurses' collaboration and nursing practice environment were found. In a qualitative study, Sevilla-Zeigen (2016) showed how a healthy work environment could influence the patients' safety and nurses' quality of care. The participants highlighted the significance of effective relationship, teamwork, and collaboration in improving the healthy workplace in the health care settings. As argued by Lemetti et al. (2021) effective collaboration between nurses require support from the organizations and managers with a greater respect on mutually arranged guidelines, objectives, and policies. In a recent study by Mohammadzadeh et al. (2021), it was found that providing a healthy working environment could affect the nurses' outcomes such as their career success. In this regards, some studies highlight

the importance of organizational factors and working environment in providing high quality nursing care (Valizadeh et al., 2018; Ahmadpour et al., 2020; Zamanzadeh et al., 2017). In addition, Sapar and Oducado (2021) believe that the shortage of nurses is a global issue that influences the quality of nursing care. Moore and Prentice (2013) maintain that supporting the collaborative practice by nurse managements and providing innovative opportunities for nurse-nurse collaboration could improve nurses' collaboration in the health care settings. Lemetti et al. (2020) also believe that nurses should develop and demonstrate their competence, knowledge, expertise, trust, respect, and fairness as equals with their collaborating partner, demonstrating a collaborative team work.

5. Implications and limitations

The result of this study could have some implications in the clinical settings. Nurse managers and leaders should encourage nurses to work collaboratively. Nurse managers should improve nurses' skills in some areas of collaboration such as conflict management. Moreover, they should provide a healthy working environment and remove the barriers which may impact nurses' collaboration. Improving the practice environment of nurses and providing a healthy workplace could improve the intraprofessional nurses' collaboration.

A limitation of this study is the selection of all participants from the teaching hospitals. Future studies should increase the geographical range of the research and consider diverse types of hospitals (e.g., teaching vs. non-teaching, private vs. public hospitals). Furthermore, we collected data from the perspective of nurses and it is recommended that future studies be carried out on nurse managers, patients, and families. Despite the limitations, this research provides knowledge of nurses' perception of intraprofessional collaboration in the clinical settings and the relation of working index with nurse-nurse collaboration.

6. Conclusion

This study aimed to assess the relationship between nursing work environment and nurses' collaboration in clinical settings. The results showed that the nurses' collaboration is at an acceptable level in general, but some areas including conflict management require more attention from the nursing staff. Moreover, the mean score of the nursing working environment showed a lower score in areas such as resource adequacy and staffing and the leadership and nurse managers' support of nurses. Therefore, nurse managers should support nurses and better staffing in the clinical settings. According to the result, the nursing practice environment showed a significant correlation with nurses' collaboration. Hence, improving the practice environment of nurses and providing a healthy workplace could improve the intraprofessional nurse's collaboration. It is suggested that hospital managers and policy makers should develop appropriate strategies and take the necessary measures to improve the practice environment of nurses to increase their collaboration for providing high quality care.

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Author's contribution

MG, RG, HH, JD participated in study conception and design. RG collected the data. MG, HH, JD, and RG also participated in data analysis and drafting of the article were done by MG, RG, HH, JD. All authors critically revised the manuscript.

Conflict of interest

None

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ORIGINAL RESEARCH

A Qualitative Study on Nurses' Experiences of Reporting Patient Safety Incidents in East Nusa Tenggara, Indonesia

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Abstract

Background: Reporting patient safety incidents is important to improve patient safety and quality of care. Barriers to report patient safety incidents in nursing may occur due to lack of knowledge and unscheduled as well as low reporting rates. Unfortunately, nurses' experiences in reporting patient safety incidents have not been comprehensively reviewed.
Purpose: The purpose of this study was to explore nurses' experiences of reporting patient safety incidents in East Nusa Tenggara, Indonesia.
Methods: A descriptive phenomenological approach was used to identify, analyze and describe the experiences of 15 nurses in reporting patient safety incidents. Nurses having worked for more than two years, not on leave, not being infected with COVID-19 in the last 14 days, and not having a structural position were purposively recruited. Data were collected using in-depth interviews and voice recordings. The collected data were then transcribed verbatim, and thematic analysis was applied for data analysis.
Results: Four main themes were found in this study, which included: (1) Priority and responsibility for services, (2) Barriers to incident reporting, (3) Learning for nurses, and (4) Support for nurses.
Conclusion: The nurses experience of in reporting safety incidents is still constrained by several obstacles. It is hoped that health care organizations need to provide appropriate strategies to enhance the safety incident reporting efforts made by nurses. Based on the research findings, it is recommended that health service organizations disseminate the use of safety incident reporting forms and assist nursing managers to their subordinates by conducting supervision and motivation related to incident reporting on a scheduled and continuous basis.

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1. Introduction

Today, the progress and complexity of health care have led to a growing demand for quality and safe forms of health care services for patients. The high mortality and morbidity associated with health care errors show the importance of improving patient safety in health care units (Amiri et al., 2018). Nurses have an important role to play in improving patient safety.

The nursing care process provides opportunities for nurses to be close to patients and gives them more time with patients. The continuous interaction process between nurses and patients risks causing injury to patients (Amaniyan et al., 2020). When an injury occurs to a patient, nurses need to report to identify and correct errors that threaten patient safety. The data obtained from incident reports can be used to understand the scale and hazards arising from services and as a form of learning to reduce ongoing risks (World Health Organization, 2020).

Patient safety incidents reporting should make a major contribution to revealing the risk of injury posed by nurses. A good safety incident reporting process should pay attention to ways to identify risks, clear risk priorities, methods for analyzing and investigating sources of risk, good communication among staff, and follow-up on problems that arise (World Health Organization, 2020). The patient safety reporting process carried out by nurses is still not optimally carried out due to obstacles with sharing reasons such as the reluctance of nurses to report for fear of punishment, lack of knowledge, lack of time, excessive workload (Alves et al., 2019), absence of role models, lack of response from supervisors/leaders, and the belief that reporting is not part of

a nurse's job (Lee et al., 2018). Another study illustrates that demographic factors such as gender and marital status can affect patient reporting safety incidents (Jember et al., 2018).

Since 2006, health care facilities in Indonesia have implemented a safety incident reporting system; however, its implementation has not been maximally implemented due to a lack of understanding and a lot of confusion among Indonesian health workers (Dhamanti et al., 2019). In addition, the number of patient safety reports nationally is still low. During 2015-2019, the number of patient safety incident reports was 12% (Indonesian Hospital Association, 2020). Another study conducted by Tristantia (2018) shows that the incident reporting system in Indonesia is still not timely. Reporting patient safety incidents that are not carried out properly can have an impact on decreasing the quality of patient care and patient safety (Gqaleni & Bhengu, 2020), medication errors (Zarea et al., 2018), and death for patients (Martin et al., 2019).

Various problems related to reporting safety incidents that occur in nursing services require efforts to identify incident reporting problems from the perspective of nurses to understand the conditions experienced by nurses regarding reporting as a whole. In Indonesia, the study of reporting safety incidents by nurses is still limited and has never touched the comprehensive experience of nurses in reporting safety incidents. Existing studies are limited to looking at cultural and practical barriers (Dhamanti et al., 2020; Hewitt et al., 2017), the influence of the work environment (Faridah et al., 2021), the impact of leadership and nurses' perceptions (Wanda et al., 2020) and the attitude of nurses in reporting safety incidents (Kusumawati et al., 2019). Therefore, this study was conducted to explore nurses' experience in reporting safety incidents, so that it could be an input for managers and health care organizations to determine appropriate actions for nurses in improving patient safety reporting.

2. Methods

2.1 Research design

The present study employed a descriptive phenomenological approach. Descriptive phenomenology aims to shape the understanding of life experiences while emphasizing the richness, breadth, and depth of those experiences (Streubert & Carpenter, 2011).

2.2 Setting and participants

This study involved two hospitals in East Nusa Tenggara, Indonesia and was conducted from September to December 2020. The first hospital is a type B general education hospital with a plenary level of accreditation status. In contrast, the second is a type C police hospital with a major level of accreditation status. The choice of hospital was due to the low level of reporting of safety incidents by nurses.

Recruitment of the participants began with an approach to the unit manager to obtain data on nurses that matched the inclusion criteria, such as (1) Nurses with more than two years of service, (2) Nurses who were not on leave, (3) Nurses who had not been declared in the last 14 days infected with COVID-19, (4) Nurses who did not have a structural positions. A purposive sampling technique was used to recruit these participants. In total, participants involved in the study were 15 nurses.

2.3 Data collection

After getting the name of the potential participants, the researcher took a personal approach to ask for approval. When participants agreed to be involved in the study, potential participants were asked to provide their telephone numbers, and the researcher contacted them to determine the interview process. After the list of potential participants with telephone numbers was collected, the researchers contacted them by telephone and made an appointment with the participants for an interview session.

The interview process was carried out at the hospital where the nurse worked during working hours. The interview was conducted for approximately 60 minutes face to face with health protocols during the COVID-19 pandemic, such as using two-layer masks, maintaining a distance of two meters, not making direct physical contact, disinfecting the interview room, and before starting the interview, participants and researchers washed their hands thoroughly—hand rub. In this study, in-depth interviews in the form of semi-structured interviews for each participant were conducted using the interview guidelines (Table 1). During the interview, field notes were written in response to each condition indicated by the participants. The researcher tried to be as objective

as possible in dealing with participant statements by not including the researcher's opinion and trying to drown in the phenomena expressed by the participants. Data saturation was achieved through in-depth interviews with participants so that no new information was obtained from each participant. Also, participants' privacy and confidentiality were maintained during the interview by submitting a research approval letter, asking permission to record the interview audio, ensuring that the interview room was away from crowds, and the researcher only used the interview results.

Table 1. Interview question guidelines

Interview Questions
- What do you know about reporting patient safety incidents?
- How do you report patient safety incidents?
- What is your motivation in reporting patient safety incidents?
- What did you experience and feel when reporting a patient safety incident?
- Is the patient safety incident reporting activity a burden for you, and what is the solution?
- How do your colleagues, other healthcare teams, and leaders respond when you report patient safety incidents?
- What problems or challenges did you experience while reporting a patient safety incident?
- Are there any other experiences you would like to share with patient safety incident reporting?

2.4 Data analysis

The data were analyzed using a thematic analysis. A thematic analysis approach is needed to identify, analyze, organize, describe, and report on the themes found in the data set from the interview results (Braun & Clarke, 2006). The thematic analysis process used the approach offered by (Nowell et al., 2017) with the following guidelines: (1) Know data well; researchers read the entire data set of nurses' experiences before starting coding to understand the depth and breadth of experiences expressed by nurses; (2) Creating initial codes; this was conducted by two researchers manually by using a template to simplify specific characteristics of the nurses' experience data by being coded and organized into different code lists; (3) Searching for themes; this was done inductively; themes were identified based on the experience data of the nurses themselves and have little relation to the specific questions asked to the participants; (4) Reviewing the themes; to assess whether the theme regarding the nurse's experience is reasonably coherent with existing supporting data; (5) Determine and name the theme; modify and refine the definitions of emerging themes; four researchers conducted discussions and reviewed the nurse's experience data three times, and (6) Producing the report: before writing the report, the researcher sent the analysis to the participants for their feedback through the member checking process to determine the unity between respondents' views and the researchers' representation.

2.5 Trustworthiness/rigor of the study

Rigor in qualitative research is seen as the strength of the research design and the suitability of the method for answering the objective questions posed by the researcher (Cypress, 2017). In this study, the researchers conducted several strategies to ensure rigor based on the guidelines from de Chesnay (2015) and Forero et al. (2018), as illustrated in Table 2.

2.6 Ethical considerations

Ethical approval was obtained from the Ethical Committee of the Health Polytechnic of the Ministry of Health, Kupang, Indonesia (Reference Number: LB 02.03/1/0049/2020). Permission from and the hospital director was obtained before the data collection process. All prospective participants were given a research information sheet regarding the research objectives, the role of the researcher, data confidentiality, the right to withdraw, and the length of the interview. Participants' approval marks were obtained before the interview was conducted. Consent was obtained directly from the nurses involved in the study.

Table 2. Strategies to improve the rigor of the study

Criteria	Purpose	Application
Credibility	To build confidence that research results are correct and can be trusted	- Conducted two interviews with participants to explore participants' experiences in detail. - Communicate intensely with participants before the interview to ensure the correctness of the selected participants. - During the interview process, the researcher allows participants to share their experiences without giving other opinions. - Examine the interview data carefully to ensure that the statements have answered the research objectives without any new information from the participants.
Transferability	Knowing the extent to which results can be generalized or transferred to other contexts or studies	- Use the purposive sampling technique in this study as a technique to recruit participants. - Background of research problems related to previously published studies. - Use descriptive phenomenology methodology as a type of qualitative study. - There are 15 participants involved with different demographic characteristics in the study as a sufficient condition in qualitative research.
Dependability	Ensures research findings are repeatable if investigations occur in the same group of participants and contexts.	- Make a detailed draft of the research protocol in the study. - Re-checking the accuracy of data coding by two researchers.
Confirmability	Increase the confidence that research results can be confirmed or by different researchers	- Triangulation of data using investigator triangulation, which includes the use of several researchers during the interview process. - Make a diary related to research developments by determining the topic, methodology, data analysis, interpretation of results, and presenting conclusions.

3. Results

3.1 Characteristics of participants

Nurse participants involved in this study were 15 nurses who agreed to share their experiences of reporting patient safety incidents. The majority of the participants were female (80%), graduates of Diploma 3 of nursing (66.7%), and hard work experiences of 1-5 years (40%), and attended patient safety training for one time (80%). In detail, the participant background is shown in Table 3.

3.2 Themes emerged

In this study, four themes were developed. The first theme was the priority and responsibility for services. This theme illustrates that nurses see safety incident reporting as a priority in service, a service responsibility, an effort to avoid actions that harm patients. There need to be action guidelines for nurses. The second theme was the barriers to incident reporting. It consisted of three sub-themes: low staff awareness to carry out safety reporting, lack of staff commitment, and feelings of fear, shame, and discomfort. The third was learning for nurses. This theme describes that nurses have gained new knowledge when reporting safety incidents and can learn to see mistakes to improve. The last was support for nurses. The main picture of this theme is that nurses feel there is support from the organization and the availability of rewards for nurses when reporting incidents.

Table 3. Characteristics of participants (n=15)

Characteristics	f	%
Gender		
Male	3	20
Female	12	80
Education		
Diploma 3 of nursing	10	66.7
Bachelor of nursing	5	33.3
Work experience		
1-5 years	6	40
6-10 years	4	26.7
>11 years	5	33.3
Patient safety training		
1 time	12	80
2 times	2	13.3
>2 times	1	6.7

3.2.1 Priority and responsibility for services

The theme of priority safety and service responsibility illustrates the nurses' perceptions of the importance of reporting patient safety incidents. Several participants said that they viewed the reporting of safety incidents as a priority in the services they provide.

> "Patient safety reporting is something we must do and prioritize in nursing services. After reporting, we can avoid the same mistakes. If we report it, there will be an evaluation and improvement of nursing services" (P1)

In addition, the nurse perceived that reporting patient safety incidents was aimed at protecting patients; nurses should understand it as a service responsibility.

> "If we want patients to remain safe from the dangers of our care, nurses must see that incident reporting is the knowledge that all nurses should have. Nurses must be well-informed about what needs to be reported. In addition, reporting the incident is mandatory; all minor incidents must be reported" (P8)

Efforts to protect patients, according to the nurses, are not limited to incident reporting. The critical thing to do is to ensure that the patient remains safe. The nurse said that it should start with efforts to avoid actions that harm the patient.

> "It is not enough just to report incidents; the most important thing is that nurses always try to avoid the dangers that arise such as advising patients to wear loose clothing, installing bed protectors, and periodically checking the patient's identity bracelet." (P7)

Nurses also viewed that to support patient safety efforts in a comprehensive manner that can be implemented in the hospital, the action guidelines should be available as a guide for nurses.

> "In ensuring that patients remain safe, we must have safety standards such as prevention of the risk of falling, prevention of infection, use of high alert drugs. This guideline must be in the room and updated according to the development of existing science." (P9)

3.2.2 Barriers to incident reporting

This theme consists of several sub-themes that describe the barriers felt by nurses related to patient safety incidents reporting.

3.2.2.1 Low staff awareness

According to the participants, although the efforts to implement patient safety have been done, its implementation is not yet optimal. Some participants stated that staff awareness was still low to carry out safety reporting.

> "There are various kinds of people with attitudes who realize that this is very important, while others do not care. Usually, those who have low awareness will ignore any incidents; they still think that it is a normal thing." (P14)

Other participants also expressed low concern for the issue of reporting patient safety incidents. P12 stated: *"I see on many occasions, my co-workers sometimes don't care, especially if there is an error, but the patient is not injured, so they consider it normal."*

3.2.2.2 Lack of commitment

Different participants said that they found that there was no common understanding and commitment among other health workers regarding efforts to implement patient safety incident reporting.

> "Laboratory personnel are often ignorant or do not respond appropriately. When we send specimens for inspection, they often forget, and we are forced to resend specimens. They did not report this mistake as an incident." (P4)

One participant (P9) said that the desire to report incidents as a form of work commitment was still low; he stated: *"Among my colleagues, I see that commitment is still low, always as a team leader I remind my members during shifts to report incidents, but there are still those who do not report."*

3.2.2.3 Feel scared, embarrassed, and uncomfortable

Another barrier expressed by participants in this study regarding patient safety incident reporting activities was that nurses felt afraid, embarrassed, and uncomfortable with their colleagues when they wanted to report. The pressure felt was expressed by several participants.

> "I feel embarrassed to report an incident that happened, either by myself or by a friend, it's like exposing ourselves, stripping ourselves apart, and it feels uncomfortable if we want to report such mistakes." (P3)

The emotional problems felt by nurses when they were going to report patient safety incidents were also conveyed differently by one of the participants; P6 stated: *"What I feel when I want to report a safety incident is a bad reaction from my supervisor or senior nurses, they are usually angry, although in the end they also advise me, it scares me."*

3.2.3 Learning for nurses

The importance of reporting patient safety incidents is the beginning of the learning process to prevent the same incident from happening again. Reporting was considered very useful for reducing incidents and improving the quality of patient safety services. By reporting patient safety incidents, nurses gain new knowledge in services. Some participants expressed knowledge about the benefits of patient safety incidents reporting.

> "Reporting allows us to be able to find out the cause of the problem so that it can be resolved and repaired, that way our services are getting better, patients feel satisfied so that in the future the number of patient visits increases and the hospital benefits." (P6)

Other participants revealed that through good reporting, nurses could also learn to find mistakes and make improvements. P15 expressed: *"There is new knowledge that I get when I make a report. I can find out the wrong action so that in the future I can provide good service to patients."*

3.2.4 Support for nurses

Hospitals have an essential role in reporting patient safety incidents. The hospital as an organization in the patient safety program always reminds, supports, and motivates reporting. Participants expressed their experiences as follows:

> "The leaders always remind us to make a safety incident report even though the incident is small, besides that they do not scold us if there is an incident that we report, but we are still reminded always to be vigilant." (P11)

Different participants explain that if the nurse reports an incident, the hospital will count the actions taken as performance points so that the nurse gets rewarded for their action.

> "If we make a report about problems we do or encounter while caring for patients, we will get five points to increase our performance credit, the more points we get, the better the performance, and we will get additional wages in the form of a performance allowance." (P7)

4. Discussion

This study aimed to explore the nurses' experiences of patient safety incident reporting. From the data collection and analysis results, four themes were found: (1) Priority and responsibility for services, (2) Barriers to incident reporting, (3) Learning for nurses, (4) Support for nurses.

4.1 Priority and responsibility for services

In this study, the participants viewed that reporting patient safety incidents was the responsibility of the services carried out by nurses. A similar view was found in a previous study which explains that nurses feel the need to take responsibility for their mistakes and emphasizes the importance of collecting data about errors for preventive action in the future (Vaismoradi, Vizcaya-Moreno, et al., 2020). Nurses are responsible for any actions and consequences, whether therapeutic or harmful (Tan et al., 2020).

Reporting efforts as a form of responsibility alone is not enough. Therefore, serious efforts are needed to avoid actions that endanger patients as a priority in service. In line with these findings, a previous study reported that the factors determining patient safety must begin with efforts to avoid actions that harm patients, including preventing medical errors and other adverse events (Vaismoradi, Tella, et al., 2020). Nurses must actively build moral awareness and commitment to minimizing actions that harm patients (Kleemola et al., 2020; Younas et al., 2020).

Nurses in this study also viewed that reporting patient safety incidents could be appropriately implemented; so, nurses must be equipped with knowledge and work according to applicable standard procedures. A previous study about the nurses' need for safety knowledge (di Simone et al., 2018) explained that the experience and skills of developing patient safety-related science are essential to forming the correct behavior of a nurse in preventing errors when providing services to patients. Standard protocols to reduce the risk of errors also need to be developed significantly to minimize negligence. Everyone involved in the process must develop standard patient safety procedures and implement them in inpatient care (Papadakis et al., 2019).

4.2 Barriers to incident reporting

Barriers to reporting safety incidents were identified in this study. The nurses explained that staff awareness was still low regarding incident reporting. This finding is in line with a study conducted by Khalil and Lee (2018) who identified problems surrounding reporting medication errors in nursing. The result indicated that nurses' awareness is still low in reporting safety incidents. Nurses need to be reminded to do reporting. The supportive work environment affects nurses' willingness to voluntarily report incidents (Chen et al., 2018). Nursing managers need to continuously create a work environment conducive to nurses and remind them to make reports in an incident that endangers the patient.

This study found that the obstacle felt by nurses was the absence of commitment from other professions to support patient safety incident reporting efforts. Joint commitment among health workers for reporting safety incidents is an important thing that must be built-in in patient safety efforts. Commitment is a significant predictor of all existing safety outcome measures in

healthcare facilities (Kuosmanen et al., 2019; Mashi et al., 2018). All health professionals should understand patient safety reports and cover the entire spectrum of care available in the health service. Each profession has a responsibility to report incidents that include various events from their immediate environment.

Another finding in this study showed that nurses felt that patient safety incident reporting activities make them afraid, embarrassed, and uncomfortable with their colleagues when they want to do reporting. A study conducted by Lee et al. (2019) related to barriers to reporting safety incidents in Korea among 16 health workers (six doctors, eight nurses, and two pharmacists) experiencing patient safety incidents, the same thing as found in this study, showed that health workers felt embarrassed to report safety incidents due to experiencing various emotional reactions such as shame, guilt, and depression, as well as behavioral changes such as insomnia, avoidance, and consideration of career changes. Another study describes the embarrassment because nurses think they have made a mistake and regret it for harming health care professionals and institutions (van Gerven et al., 2016). The psychological condition experienced by nurses must be taken seriously; assistance needs to be done to report every incident without any pressure.

4.3 Learning for nurses

By reporting patient safety incidents, nurses explained that they are gaining new knowledge that supports their practice. The findings of this study are in line with a study by Rashed and Hamdan (2019), where it was explained that nurses viewed incident reporting as something positive because they can learn from mistakes and are more motivated to report in the future. In particular, incident reporting was assessed as a catalyst to change the way of thinking about risk, increase knowledge and awareness of the good practice, and highlight the need for resources that can shape safety culture. Safety incidents are not isolated but are influenced by a more significant problem (Leistikow et al., 2017). Therefore, health care providers, including nurses, need to learn how to solve the infinite variable of safety problems by studying and designing corrective actions following available science and regulations.

After learning from the problems that arise, the nurse sees that incident reporting is a means to improve service. Adverse incident reporting is a cornerstone of clinical governance and supports health care improvement. The resulted information can serve as a guide for service improvement. A study that analyses the impact of incident reporting on service improvements carried out by Carlfjord et al. (2018) shows that reporting has a significant effect on improving patient safety governance, which helps put patient safety at the top of the agenda for health care practices and changes in a non-blaming reporting culture among health workers.

4.4 Support for nurses

The findings of this study showed that patient safety reporting has the support of leadership. Previous research found that organizational strength has an important influence on hospital patient safety efforts through management support for safety, promotion of patient safety measures by supervisors, and feedback or communication about errors (Ali et al., 2018). Attention from the organization can increase reporting awareness to reduce the number of mistakes. Organizations need to establish a sound system to ensure patient safety is a priority service provided to patients.

Nurses in this study also reported about the attention of organizations to reporting safety incident activities through increasing wages. In a safety culture, people are rewarded for improving safety, either as individuals or team members. A study conducted by Ahmed and Faheem (2021) showed that incentives affect motivation to carry out safety reporting but are not applied in the long term because salary to improve safety culture is only effective in the short term. The organization needs to establish an appropriate approach to enhance the continuous reporting of safety incidents over a long period. Furthermore, a study conducted by Hennessy et al. (2018) concluded that in promoting patient safety, hospitals need to improve their knowledge, skills, and attitudes towards a sustainable patient safety culture through training programs, benchmarking, institutionalization and accreditation.

5. Implications and limitations

This study provides interesting findings that are important for understanding the phenomenon of nurses in reporting patient safety incidents. Given nurses' perceived barriers in reporting safety incidents, nursing managers need to provide effective guidance for their subordinates to openly and actively report patient safety incidents. The results of this study provide input for health care organizations to develop a conducive work climate to support nurses in reporting patient safety incidents.

This research has limitations. Because this study reflects the perspective of nurses in one particular area at a time, it may not be representative of another broader group. Thus, future research can be carried out to explore the experiences of nurse groups from a wider population.

6. Conclusion

This study produces an essential theme regarding the experience of Indonesian nurses in reporting safety incidents. Nurses see that safety incidents are a responsibility they must have and become a priority in service to patients. The nurse also recognizes that incident reporting can be a good learning tool to reduce similar errors in the future. Even though nurses' positive reports, they also felt that there were still obstacles in implementing safety incident reporting efforts that could threaten patient safety management. The provision of performance incentives for incident reporting and motivation from the leadership that has been done needs to be maintained, however as a long-term strategy, and service organizations need to think about the right approach to create a safety culture in the hospital through the development of appropriate regulations.

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Author's contribution

PKST: study design, conceptualization, data collection, data analysis, manuscript writing; ATB: study design, manuscript writing, data collection; YB: study design, data analysis, data collection; AEBP: study design, data collection, data analysis.

Conflict of interest

None

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ORIGINAL RESEARCH

Psychometric Testing of the Technological Competency as Caring in Nursing Instrument – Revised (English Version Including a Practice Dimension)

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Abstract

Background: The middle range theory Technological Competency as Caring in Nursing (TCCN) guides nursing practices. The TCCN Instrument (TCCNI) measures perception dimension of the theory and has been revised and translated into the Japanese language (TCCNI-R). Testing the translated version of the TCCNI-R to English language with the inclusion of a practice dimension is warranted.
Purpose: This study aims to determine the psychometric properties of the TCCNI-Revised English version with Practice dimension (TCCNI-RePract).
Methods: A web-based cross-sectional study was conducted with data from 202 valid questionnaire copies from professional nurses in selected hospitals and nurse educators in universities.
Results: The suitability for factor analysis was determined using Kaiser-Meyer-Olkin index (0.93), Bartlett's sphericity test of 3256.93, $p<0.001$, the anti-image correlations ranged between 0.87 and 0.96, and an average value of communalities of 0.66. In the four rotations conducted with the maximum likelihood method with a Harris-Kaiser Orthoblique rotation, four items were excluded with factor loadings less than 0.40. These results determined the final scale with 21 items and four subscales, namely: (1) Knowing the person (8 items); (2) Technological competency as Caring (6 items); (3) Technology and caring (4 items); and (4) Expression of nursing as Caring (3 items). Cronbach's alpha coefficient for the total scale was 0.94. With two dimensions of the TCCNI-RePract, the perception dimension had significantly higher scores than the practice dimension. When comparing mean factor point among the dimensions, the perception scores were significantly higher for Factor 1 and Factor 3.
Conclusion: The TCCNI-RePract is an acceptable tool that can reliably measure nurses' perception and practice of TCCN. It is affirmed that with this tool, measuring perception and practice status of TCCN theory is possible. It is considered that the evaluation results can be used to plan in-hospital education.

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1. Introduction

In the late 1960s, the nurses' greatest tools were pen and paper. Before the age of computing and the advent of computers, nurses relied on their senses to evaluate and monitor specific physiological changes in their patients (Pepito & Locsin, 2018). The nurses viewed the technology that appeared in the 1960s as useful and innovative to enhance the reliability and validity of nurses' traditional observations (Sandelowski, 1997a). However, there is a wide disparity between nurses who had a positive attitude towards the advent of technology and nurses who expressed critical arguments against technology who are focusing instead on the human relationship (Barnard, 1996). In the mid-1980s and late 1980s, nursing was broadly divided into functions, namely: (a) the performance of technically required medical functions and (b) supportive and

expressive practices (Fenton, 1987). The first function is focused on the technical and operational functions, while the latter centers on people, caring, and constitutes most independent functions.

With the rapid advancement of technology, nurses were enforced to discover how technology could influence nursing practices and explore its integration into the nursing profession (Sandelowski, 1997b). Neighbors and Eldred (1993) state that both technology and caring are essential to the attainment of quality in healthcare. Additionally, Barnard and Sandelowski (2001) critically considered the dichotomy between technology and human care in nursing by emphasizing the need to rethink the relationship between technology and nursing. Locsin (2005) developed a nursing theory among such a historical backdrop, namely, the Technological Competency as Caring in Nursing (TCCN). This TCCN theory is a middle-range theory that guides nursing practice and was developed based on Boykin's and Schoenhofer's (2001) grand theory. Based on TCCN, the technological competency of nurses promotes the understanding of persons as participants of care rather than as objects of care (Locsin, 2005).

Furthermore, Locsin (2005) argued that recipients (patient or family) of care are more likely to be treated as products in medical settings where technological needs are high. However, it is essential to regard the patient as an indispensable person in implementing patient-centered care (Locsin, 2005). Locsin (2017) also underlined the importance of theory-based nursing practice, arguing that understanding technology and recognizing care using technology as expressed in various nursing situations lead to harmonious nursing assistance through "Technology and Caring." Integrating nursing theory and practice improves the quality of nursing care and supports nurses in all settings (Ahtisham & Shannon, 2019; Neto et al., 2016), and ultimately provide better outcomes for patients and institutions (Dyess et al., 2010).

During nursing's historical transitions, Locsin (1999) developed the Technological Caring Instrument (TCI) based on TCCN theory in 1999 to measure technical skills in critical care settings. Parcells and Locsin (2011) revised the TCI to develop the Technological Competency as Caring in Nursing Instrument (TCCNI). TCCNI has been translated and used in various countries (Biswas et al., 2016; Rincón-Álvarez & Chaparro-Díaz, 2017; Yuliati et al., 2019). Tanioka et al. translated and published TCCN theory in Japan in 2009 (Locsin, 2009). While going through that process, Tanioka (2018) realized that it would be effective if nurses' perception of TCCN theory and their actual practice situation following TCCN theory could be measured and expected to be used for in-service education and individual nurses' self-reflection. Therefore, Tanioka's research team has been developing an improved version of the TCCNI (Tanioka, 2018). For example, Kato et al. (2017), based on the TCCN theory, created the Perceived Inventory of Technological Competency as Caring in Nursing (PITCCN) and administered the survey among Japanese nurses' perceptions and practice situations of TCCN theory. According to Kato et al. (2017), the recognition of TCCN, that is, the perception of TCCN, is the intensive care unit nurses' agreement of Locsin's (2005) TCCN theory as measured by the PITCCN. Therefore, a higher score means higher recognition of TCCN. Alternatively, the practical situation of TCCN is their actual practice of TCCN based on his theory measured by evaluation of self-using PITCCN. Therefore, a higher score means a higher practice of TCCN. Their findings show that, although they were aware of the importance of TCCN theory, they cannot fully practice their profession based on this theory (Kato et al., 2017).

The PITCCN has been validated for criterion-related validity (Miyamoto et al., 2017, 2019). Moreover, the PITCCN was modeled by structural equation modeling, and its reliability and construct validity were verified using Cronbach's alpha (Ito et al., 2019). Tanioka (2018) also developed the Japanese version of the TCCNI from its original instrument. In addition, his team has developed the *Technological Competency as Caring in Nursing Instrument–Revised (TCCNI-R)* for use in both the Japanese and English languages.

Nakano et al. (2019, 2021) used the Japanese version of TCCNI-R to investigate the educational effects of TCCN theory on nursing administrators and found that teaching TCCN theory improved nursing administrators' understanding and perception of TCCN theory. Also, Yokotani et al. (2021) evaluated the Japanese version of the TCCNI-R by exploratory and confirmatory factor analysis by employing SEM to test for construct validity, and Cronbach's alpha confirmed its reliability. Based on the TCCNI–R, an English version focusing on the perception and practice dimension of the theory of TCCN was designed as the TCCNI-RePract.

The survey using TCCNI-R (Japanese language) was conducted with Japanese subjects. Findings of the study revealed that respondents were influenced by Japanese culture and social

background. Moreover, only few studies were available investigating differences between the perception and practice, which were pertinent (Kato et al., 2017). Also, no research has been conducted on the English version of TCCNI-R to clarify the perception dimension and practice dimension situation of TCCN theory. Consequently, investigating the differences between the perception and practice of TCCN theory and accumulating further knowledge, will be necessary to measure improved nursing practice, and caring expressions of both nurses and patients. Based on the TCCNI–R, an English version focusing on the perception and practice dimension of the theory of TCCN was designed and entitled the TCCNI-RePract (Revised for Practice).

This study aimed to determine the psychometric properties of the TCCNI-Revised English version with Practice dimension (TCCNI-RePract).

2. Methods

2.1 Research design

This study employed a web-based cross-sectional research design.

2.2 Setting and samples

This study was conducted using an international online survey platform (Survey Monkey©) from March to May 2021. This study used a convenience sampling method to recruit the subjects. The selection of subjects was based on the following inclusion criteria: working as nurses or nurse managers in the hospital, or nursing instructors supervising students for their clinical practice in the hospital. Exclusion criteria that made the subjects ineligible to participate in the survey included those who decided to quit and did not complete answering the questionnaire for any reason.

Statistical power analysis was conducted to estimate the sample size. In this study, the criterion set by Cohen (1988) was used, and the effect size was calculated using G*Power version 3.1.9.7. (Faul et al., 2007) with an effect size of $p = 0.3$, $\alpha = 0.05$, and power = 0.95, the predicted sample size using the formula for the paired t-test was 134. There were 202 subjects in this study who were nurses working in selected hospitals and academia. Therefore, it was considered that the sample size for this study is appropriate.

2.3 Instrument and data collection

In conducting this study, the research team contacted colleagues from various countries and regions, including the Philippines, United States of America, Saudi Arabia, and others, to distribute the questionnaire to their colleagues and nurse educators using the URL. In addition, nurse managers were also invited to participate online through the researchers networking activities. Similarly, the information regarding the study and URL was sent to them with the request to share the information about the research to their nursing staff and colleagues in the hospital settings. The questionnaire was also distributed through social media platforms (e.g., Facebook© and WhatsApp).

In this study, the researchers used TCCNI-RePract, an English version of TCCNI-R. In the TCCNI-R Japanese version, five questions were negatively stated (Yokotani et al., 2021). The formulation of the negatively stated question items usually effects a decrease in the bias of participant responses (Paulhus, 1991); however, a possible problem may arise when these items result in forming another factor or may influence the reliability of the instrument (Masuda et al., 2012). Therefore, in the TCCNI-RePract English version, the researchers did not formulate any negatively stated items, but rather, modified some items: From 25 items, 10 items were the same as the previous TCCNI-R, and 15 items were modified. Of 15 modified items, 5 reverse scoring questions (Q5, Q7, Q11, Q15, and Q24) were modified into normal score items, and 10 items (Q2, Q8, Q9, Q12, Q13, Q19, Q20, Q21, Q22, and Q25) were modified in terms of modifying, adding, or deleting the parts/contents of the sentence.

The first author and the second author of this study were the same persons who developed the TCCNI-R, therefore, permission in order to modify the tool was not required. Furthermore, the focus of the TCCNI-RePract included the practice dimensions of the theory, which was not included in the TCCNI-R Japanese version.

In this study, the TCCNI-RePract is an instrument that evaluates two dimensions of the TCCN theory, i.e., perception and practice. It comprises 25 items for each dimension, a total of 50 items. The perception dimension questionnaire items were developed with a 7-point Likert scale, with

values ranging from 1 as "Strongly Disagree" to 7 as "Strongly Agree." The practice dimension questionnaire items were developed with a 7-point Likert scale with values ranging from 1 as "Never" to 7 as "Always."

For establishing content validity, four experts in caring research were involved in administering the 50-item questionnaire of the TCCNI-RePract, and examined each item by considering the consistency of the constructs. A pilot study was administered to seven nurses who had 1 to 30 years of clinical nursing experience. Respondents were asked to write freely about the ease of answering the questionnaire, their response time, ease of understanding the questions, and indicate items for improvement. Based on the results, the questionnaire items were reviewed and revised.

2.4 Data analysis

In analyzing the data, the following steps were conducted. First, frequency (n) and percentage (%) were calculated to show the demographic characteristics of the study subjects. Subsequently, mean, standard deviation, and 95% confidence interval (CI) were calculated to assess the floor and ceiling effects. In order to verify whether or not the data fit prior to the exploratory factor analysis (EFA), Bartlett's sphericity tests were applied (p<0.0001), and the sampling adequacy was measured with the Kaiser-Meyer-Olkin (KMO) index. The anti-image correlations and communalities were determined for each item.

Next, construct validity of the scale was assessed with EFA. It was performed using the maximum likelihood method with a Harris-kaiser orthblique rotation. The Cronbach alpha was calculated to assess the reliability of the scale. The content validity index of the whole instrument was calculated. Afterward, paired t-test was used to compare the average total scores for the perception and practice dimension and the mean factor points (MFP) for each item. The practice dimension question items were used and matched with items of perception factors. Data analysis was performed using Microsoft Excel, SPSS statistical software version 27 (IBM Corp), R (version 4.0.4, R Foundation for Statistical Computing, Vienna, Austria) (R Core Team, 2018).

2.5 Ethical considerations

The ethical code for this international study was obtained from the Ethics Committee of Tokushima University Hospital (approval number 2914-3). Participation by the subjects was voluntary; no penalty was applied if they decided to quit the study at any time. Personal information was kept confidential by securing access using a password. All personal data were secured in the researcher's computer that was also accessible only through a password known only by the principal researcher.

3. Results

3.1 Characteristics of the respondents

Table 1 shows the demographic characteristics of the study subjects. A total of 202 respondents were included in this study. Most of them were female nurses (66.8%), aged 30 to less than 40 years (43.6%), and 83.6% of the subjects were nurses from the Philippines.

3.2 The score of perception and practice dimension

Table 2 shows the score of the perception and practice dimension. The item of perception dimension with the highest score was Q7 (M=6.53, SD=1.18, 95%CI=6.37-6.69) while the item with the lowest score was Q11 (M=4.66, SD=1.71, 95%CI=4.42-4.90). The item of practice dimension with the highest score was Q14 (M=6.58, SD=0.70, 95%CI=6.49-6.68) while the item with the lowest score was Q11 (M=4.44, SD=1.75, 95%CI=4.19-4.68).

3.3 The final exploratory factor analysis of the scale items

Table 3 shows the final exploratory factor analysis of the scale items, including the correlation among factors, and Cronbach's alpha for each factor, and overall scale.

A series of five exploratory factorial analyses were conducted to arrive at a best-fitting solution. As a result, there were four eigenvalues greater than 1.0; these four factors explained 50% of the total variance in the data; items were a factor loading of more than 0.40. EFA suggested four factors based on the scree-plot and the cumulative contribution rate, and these were seen to be conceptually appropriate from the meanings of the items assigned to each factor. Four items

with low factor loading were deleted (Q1, Q8, Q9, and Q11). For the final model derived from the exploratory factor analysis, an instrument with 21 items and a four-factor structure was created. Those four factors are: (1) Knowing the Person (8 items); (2) Technological Competency as Caring (6 items); (3) Technology and Caring (4 items); and (4) Expression of Nursing as Caring (3 items). Cronbach's alpha coefficient for the total scale was 0.94, and the respective coefficients for the four factors were 0.93, 0.87, 0.83, and 0.81, respectively. EFA suggested four factors based on the scree-plot and the cumulative contribution rate, and these were seen to be conceptually appropriate from the meanings of the items assigned to each factor.

Table 1. Participants' demographic characteristics (n=202)

Characteristics	f	%
Age (years)		
20-29	35	17.3
30-39	88	43.6
40-49	42	20.8
50 and above	37	18.3
Gender		
Female	135	66.8
Male	67	33.2
Education level		
Baccalaureate	51	25.3
Master	121	59.9
Doctorate	30	14.8
Working units or job description		
General ward	63	31.2
Special areas	59	29.2
Nursing educator	59	29.2
Nurse manager	21	10.4
Countries		
Philippines	169	83.6
United States of America	9	4.4
Saudi Arabia	5	2.5
Indonesia	5	2.5
Malaysia	4	2.0
United Arab Emirates	3	1.5
Qatar	2	1.0
New Zealand	1	0.5
Australia	1	0.5
Sweden	1	0.5
Nigeria	1	0.5
Singapore	1	0.5

KMO was 0.93, Bartlett test was 3256.93, $p<0.0001$, and the anti-image correlations ranged between 0.87 and 0.96. The communalities of the items were range from 0.361 to 0.859, and an average value of communalities was 0.66. In the four rotations done with the maximum likelihood method with a Harris-kaiser orthblique rotation, there were four eigenvalues greater than 1.0; 4 items were excluded because their factor loadings were less than 0.40.

3.4 The compared results of the average total scores for the perception and practice dimension and the MFP

Table 4 shows the compared results of the average total scores for the perception and practice dimension and the MFP for each. Factor 1 was the highest in the MFP for the perception dimension (M=6.37, SD=0.75). Factor 4 was the highest for MFP in the practice dimension (M=6.31, SD=0.71). As a result of comparing the Perception dimension total mean score with the Practice dimension total mean score by paired t-test, it was found that the Perception dimension had significantly higher scores than the practice dimension (t=3.87, $p<0.001$). Comparing each MFP of the perception and practice dimension, the scores of perception were significantly higher in Factor 1 (t=3.96, $p<0.001$) and Factor 3 (t=5.54; $p<0.001$).

Table 2. Participants' responses to the TCCNI-RePract: Perception and Practice dimension (n=202)

Perception dimension		M	SD	95% CI
Q1	Nurses must emphasize thoughtfulness and consideration for patients.	5.22	2.56	4.86 - 5.57
Q2	Nurses are professionals who express caring utilizing competency with technology.	5.96	1.60	5.74 - 6.18
Q3	Nurses have to provide care for patients by using necessary technologies.	6.04	1.27	5.86 - 6.22
Q4	Nurses must provide nursing care through the harmonious relationship between technology and caring.	6.27	1.12	6.11 - 6.42
Q5	Nurses need to consider providing nursing care because each patient's wishes always change.	6.22	0.99	6.08 - 6.36
Q6	Nurses must make a plan of care together with the patient to ensure quality nursing.	6.30	1.32	6.12 - 6.49
Q7	Nurses need to know patient's health data in order to take care of the patient.	6.53	1.18	6.37 - 6.69
Q8	Nurses must share information with their patients in order to know them better.	5.72	1.26	5.55 - 5.90
Q9	Nurses must provide care with a thorough understanding of their own competency.	6.41	1.03	6.26 - 6.55
Q10	Nurses have to use technology in order to know patients as persons who are complete and to maintain honest relationships with them.	5.72	1.26	5.54 - 5.89
Q11	Nurses must finish nursing duties within a specific time even if they cannot completely know the patients, for example, their emotional needs or feelings.	4.66	1.71	4.42 - 4.90
Q12	Nurses must respect patients' beliefs and focus on their recovery while anticipating their hopes, needs, and desires.	6.35	1.07	6.20 - 6.50
Q13	Nurses need to maintain patients' lifestyles and allow them to regain their healthy lives.	6.05	1.17	5.89 - 6.22
Q14	Nurses must emphasize thoughtful consideration of patient's feelings, encouragement, and respect.	6.47	0.98	6.33 - 6.61
Q15	Nurses need to provide timely nursing care in accordance with patients' physical and emotional conditions.	6.46	0.94	6.33 - 6.59
Q16	Nurses must be devoted towards meeting the patient's needs, hopes, wishes, and dreams.	6.28	0.93	6.15 - 6.41
Q17	Nurses must act by carefully listening to the patients' voices and expressing compassion.	6.47	0.84	6.35 - 6.59
Q18	Nurses must consider patient's stress and anxiety level occurring within the nurse-patient relationship.	6.46	0.81	6.34 - 6.57
Q19	Nurses have to know the patients not only focusing on their physical aspects but also on accurately understanding "who they are as persons."	6.34	0.91	6.21 - 6.46
Q20	Nurses' competence includes the use of healthcare technologies from the perspective of caring in nursing.	6.36	0.80	6.25 - 6.47
Q21	Knowing the patient is understanding the whole person.	6.44	0.95	6.30 - 6.57
Q22	Nursing as caring is the involvement of nurses with patients and their families in ways that allow them to grow together in the shared nursing situation.	6.25	0.94	6.12 - 6.38
Q23	Nurses use technologies with competency in order to know patients and their families.	6.06	0.95	5.93 - 6.19
Q24	Technology is useful for understanding patients' health conditions.	6.24	0.90	6.11 - 6.36
Q25	Nurses use technology with competency as caring to facilitate patients' recovery with enhanced self-esteem.	6.09	1.01	5.95 - 6.23

Table 2. Continued

Practice dimension		M	SD	95% CI		
Q1	I emphasize thoughtfulness and consideration of patients.	6.33	0.99	6.19	-	6.47
Q2	I express caring utilizing competency with technology.	5.84	1.13	5.68	-	6.00
Q3	I provide care for patients by using necessary technologies.	5.92	1.02	5.78	-	6.06
Q4	I am providing nursing care through the harmonious relationship between technology and caring.	6.06	0.98	5.93	-	6.20
Q5	I consider patients' wishes in providing nursing care because their wishes always change.	5.91	1.01	5.77	-	6.05
Q6	I am making care plans together with the patient to ensure quality care.	6.11	1.05	5.97	-	6.26
Q7	I am assessing patient's health data when taking care of patients.	6.58	0.72	6.48	-	6.68
Q8	I share information with patients to get to know them better.	5.36	1.45	5.16	-	5.56
Q9	I am providing nursing care with a thorough understanding of my own competency.	6.42	0.84	6.30	-	6.53
Q10	I use technology to know patients as complete and to maintain honest relationships with them.	5.54	1.28	5.37	-	5.72
Q11	I finish my work within the established work time even if I could not know the patient's emotional needs or feelings.	4.44	1.75	4.19	-	4.68
Q12	I respect patients' beliefs, focus on their recovery, and anticipate their hopes, needs, and desires.	6.36	0.82	6.25	-	6.47
Q13	I am caring for patients to maintain their lifestyles and allow them to regain their healthy lives.	6.02	1.07	5.88	-	6.17
Q14	I am considerate, supportive, and respectful of the patient.	6.58	0.70	6.49	-	6.68
Q15	I provide timely nursing care in accordance with patients' physical and emotional conditions.	6.31	0.81	6.19	-	6.42
Q16	I am caring for patients to fulfill their needs, hopes, and dreams.	5.96	0.98	5.82	-	6.09
Q17	I am listening to the patient's voices and showing my compassion.	6.26	0.84	6.14	-	6.37
Q18	I provide care and consider the stress and anxieties that the patient has during a nurse-patient relationship.	6.23	0.87	6.11	-	6.35
Q19	I am working to know patients by focusing on their physical aspects and by understanding who the patient is.	6.12	0.92	5.99	-	6.25
Q20	I use healthcare technologies as one of my nursing competencies from the perspective of caring in nursing.	6.06	0.97	5.93	-	6.20
Q21	I am working to know the patient by understanding the patient as a whole.	6.25	0.95	6.12	-	6.38
Q22	I am providing nursing care by involving patients and families and including me in their growth within the nursing situations.	6.14	0.98	6.01	-	6.28
Q23	I use technologies with competence as an expression of my caring in order to know patients and their families.	5.76	1.13	5.61	-	5.92
Q24	I use technology to understand patients' health conditions.	5.88	1.12	5.72	-	6.03
Q25	I am using technology and providing caring to facilitate patients' recovery with enhanced self-esteem.	5.88	1.09	5.72	-	6.03

4. Discussion

4.1 The demographic characteristics of the study subjects

This study was conducted in Japan. However, the TCCNI-RePract is in English, not in Japanese language. Respondents of this study were from other countries who speak and understand English. Therefore, Japan is not included in this section as there are no participants from Japan in the study.

Table 3. Exploratory factor analysis result of the TCCNI-RePract: Perception dimension

Total items Cronbach's alpha = 0.94		Factor loadings			
		F1	F2	F3	F4
Factor 1: Knowing the Person (Cronbach's alpha = 0.93)					
Q19	Nurses have to know the patients not only focusing on their physical aspects but also on accurately understanding.	0.94	0.00	-0.14	0.03
Q18	Nurses must consider patient's stress and anxiety level occurring within the nurse-patient relationship.	0.90	-0.05	-0.11	0.14
Q22	Nursing as caring is the involvement of nurses with patients and their families in ways that allow them to grow together in the shared nursing situation.	0.84	0.07	0.04	-0.06
Q17	Nurses must act by carefully listening to the patients' voices and expressing compassion.	0.82	-0.04	-0.01	0.17
Q21	Knowing the patient is understanding the whole person.	0.75	-0.04	0.02	0.02
Q16	Nurses must be devoted towards meeting the patient's needs, hopes, wishes, and dreams.	0.62	0.11	0.07	0.08
Q12	Nurses must respect patients' beliefs and focus on their recovery while anticipating their hopes, needs, and desires.	0.52	0.21	-0.11	0.16
Q20	Nurses' competence includes the use of healthcare technologies from the perspective of caring in nursing.	0.49	-0.02	0.34	0.06
Factor 2: Technological Competency as Caring (Cronbach's alpha = 0.87)					
Q4	Nurses must provide nursing care through the harmonious relationship between technology and caring.	0.09	0.89	0.05	-0.23
Q7	Nurses need to know patient's health data in order to take care of the patient.	-0.14	0.85	-0.09	0.30
Q3	Nurses have to provide care for patients by using necessary technologies.	-0.03	0.80	0.22	-0.23
Q6	Nurses must make a plan of care together with the patient to ensure quality nursing.	-0.10	0.79	-0.03	0.24
Q5	Nurses need to consider providing nursing care because each patient's wishes always change.	0.33	0.66	-0.05	-0.25
Q2	Nurses are professionals who express caring utilizing competency with technology.	0.11	0.57	-0.08	0.01
Factor 3: Technology and Caring (Cronbach's alpha = 0.83)					
Q23	Nurses use technologies with competency in order to know patients and their families.	0.00	-0.07	0.86	0.09
Q25	Nurses use technology with competency as caring to facilitate patients' recovery with enhanced self-esteem.	0.20	0.03	0.76	-0.19
Q24	Technology is useful for understanding patients' health conditions.	0.02	0.10	0.64	0.15
Q10	Nurses have to use technology in order to know patients as persons who are complete and to maintain honest relationships with them.	-0.15	-0.04	0.63	0.24
Factor 4: Expression of Nursing as Caring (Cronbach's alpha = 0.81)					
Q14	Nurses must emphasize thoughtful consideration of a patient's feelings, giving encouragement, and respect.	0.02	0.12	0.06	0.82
Q15	Nurses need to provide timely nursing care in accordance with patients' physical and emotional conditions.	0.29	-0.08	0.10	0.64
Q13	Nurses need to maintain patients' lifestyles and allow them to regain their healthy lives.	0.22	-0.17	0.10	0.51
Rotation sums of squared loading	Fixed value	5.35	3.72	2.52	2.20
The correlation factor between contents: significance probability (one-sided test) Pearson	Factor 1	1.00	0.59	0.67	0.64
	Factor 2	0.59	1.00	0.45	0.56
	Factor 3	0.67	0.45	1.00	0.40
	Factor 4	0.64	0.56	0.40	1.00

Note. N= 202. The extraction method was the maximum likelihood method with a Harris-kaiser orthblique rotation. Factor loadings above 0.40 were shown in bold. F1= Factor 1, F2= Factor 2, F3= Factor 3, F4= Factor 4.

Table 4. The compared results of the perception and practice situation of the TCCNI-RePract average scores

Variable	Perception dimension		Practice dimension		*t* (201)	*p*
	MFP	*SD*	MFP	*SD*		
TCCNI-RePract average total score	6.25	0.72	6.09	0.65	3.87	< 0.001
F1 Knowing the Person	6.37	0.75	6.17	0.71	3.96	< 0.001
F2 Technological Competency as Caring	6.22	1.01	6.07	0.70	2.21	0.03
F3 Technology and Caring	6.03	0.85	5.76	0.97	5.54	< 0.001
F4 Nursing Expressions as Caring	6.33	0.88	6.31	0.71	0.41	0.68

Note. *N*= 202. Mean parameter values for each analysis are shown for perception and practice, as well as the results of a paired t-test comparing the parameter estimates between the two samples. Abbreviations: MFP = Mean factor points, *SD* = Standard Deviation, *p* = *p*-value, F1 = Factor 1, F2 = Factor 2, F3 = Factor 3, F4 = Factor 4.

4.2 The floor and ceiling effects

The ceiling effects of the items in the perception dimension were observed in all questions except Q8, Q10, Q11. No floor effect was observed in any items. Among the items of practice dimension, ceiling effects were observed in Q1, Q4, Q6, Q7, Q9, Q12-15, Q17-22, and Q24, while no floor effect was observed in any items.

Regarding the ceiling effect, it was thought that there are respondents scoring positively nearly "Strongly Agree" or "Always." However, items that the ceiling effect has not been confirmed, respondents have a different perception from the TCCN theory, or who have not practiced.

4.3 Exploratory factor analysis of perception dimension

An EFA of the perception dimension caused four items to be deleted, resulting in 21 items and four factors. As dimension reduction techniques seek to identify items with a shared variance, it has suggested removing any item with a communality score less than 0.2 (Child, 2006). According to this idea, our minimum value was 0.361; it was considered appropriate values. Moreover, an average value of communalities was 0.66, an average value between 0.5 and 0.6 is acceptable for sample sizes between 100 and 200 (MacCallum et al., 1999).

The difference in the English versions (other than language), between the TCCNI-R and the TCCNI-RePract is the added focus on the evaluation of practice situations. Perception dimension Factor 1: Knowing the Person is an essential concept in TCCN theory and knowing the person as an irreplaceable being who is constantly changing from moment to moment is the first process in the practice of nursing (Locsin, 2015). Factor 2: Technological Competency as Caring reflects the expression of caring as a technical competency of the nurse; Factor 3: Technology and Caring emphasize that technology and caring coexist in nursing (Locsin, 2017). Factor 4: Expression of Nursing as Caring reflects the emphasis on compassionate care while listening to the patient, meeting needs, and maintaining the patient's lifestyle.

Cronbach's alpha coefficient for the scale's internal consistency ranged from 0.81 to 0.93, and Cronbach's alpha coefficient was 0.94 overall, indicating that the reliability of the perception dimension was primarily achieved. However, a value was considered that there was an effect of the ceiling effect.

4.4 Differences between perception and practice dimension

In the process of comparing the average of the total score of perception and practice dimension and MFP, a significant difference was found between the average of the total score and the MFP of the first and third factors. Based on this result, in the mean scores of the total TCCNI-RePract scores, the mean scores of perceptions were higher than the mean scores of practice, which were similar to the results of the PITCCN study by Kato et al. (2017). Therefore, it was considered that while the usefulness and value of TCCN theory have been recognized, it may not have been put into practice or well-integrated into clinical settings.

Regarding the first factor, one must consider that nurses' caring behavior is influenced by several factors, including working conditions, workload, management support, and concern about patients' health conditions (Akansel et al., 2020). Also, Stavropoulou et al. (2020) suggested that organizational and functional issues, understaffing, increased workload, compassion fatigue, and professional burnout as factors complicating empathic care in practicing caring. In such circumstances, organizational support is becoming essential.

Regarding the third factor, as it was reported in previous studies of the practical status of TCCN theory, nurses who had received caring education were significantly more aware of TCCN theory than nurses who had not received caring education. However, no significant difference was found in the TCCN practice status. Nurses with long experience practiced TCCN theory significantly more than nurses with much less experience (Kato et al., 2017). In this study, the researchers did not compare the exact years of nurses' experience. Still, as it was reported, young and inexperienced nurses tended to show opposing views on the impact of technology on care (Bagherian et al., 2017). Also, a survey of midwives shows that survey participants put confidence in technology for its use, but at the same time are concerned about safety issues due to potential disabilities and lack of training when using it (Sinclair & Gardner, 2001).

Previous studies have shown that education in TCCN theory improves awareness and understanding of TCCN theory (Nakano et al., 2019, 2021). It cannot be denied that the experience of being educated in TCCN theory may affect the results of the survey. Also, providing continuous education and training is recognized as indispensable to improving nurses' caring practices (Sawatzky et al., 2009; Hsu et al., 2015). Knowledge and skills are essential for nurses in building relationships between nurses and patients, and building relationships depends on confidence in the technical abilities of individual nurses (Wiechula et al., 2016). As nurses become proficient in technology, they demonstrate a significant increase in efficiency in using technology to instantly and holistically comprehend people and find improvements to build strong patient connections in nursing practice (Locsin, 2005). When nurses say they know about a patient, the technology they use helps them understand the extent to which they understand the patient. Knowing the patient is an essential element of caring; all nurses should have the ability to obtain the clinical and personal information needed to know the patient (Kelley et al., 2013).

5. Implications and limitations

The implication of this study shows that it can compare perception and practice situation as attributes of the theory, and that this result can be used for evaluating on-the-job training (OJT) activities. The findings show that nurses were aware of the technology use in their care but might not have an optimum way to use those technologies in their practice. Therefore, managers and decision-makers in the hospital are suggested to support nursing staff to apply optimal use of technologies in nursing care through providing the supporting technologies, providing opportunities for nurses to use technologies in nursing care, and providing training or courses regarding the specific technology used in their unit. If the cause is the lack of self-confidence in nursing practice, we believe that in-service education is necessary to boost confidence.

A limitation of this study is that it involved nurses from various countries. However, the number of participants is not equal. As an international study, conducting similar study with a larger and more diverse sample size is necessary.

6. Conclusion

The TCCNI-RePract is an acceptable tool that can reliably measure nurses' perception and practice of TCCN. This scale can accurately and consistently measure nurses' perception and practice dimensions within four factors: 1) Knowing the Persons, 2) Technological Competency as Caring, 3) Technology and Caring, and 4) Expression of Nursing as Caring. Therefore, it is considered that the evaluation results can be used to plan in-hospital education.

Findings showed that nurses recognized the utility and value of TCCN theory in their practice. They were aware of the importance of technology use in understanding patients' needs, enhancing their self-esteem, promoting better health, and building better relationships with others. Hospitals and organizations promoting an environment of human caring must support nurses' continuing professional development, including the acquisition of new skills grounded on the latest evidence supporting nursing care practice for better health outcomes and optimum client satisfaction. Although nurses know the importance of using technology to deeply understand

patients, enhance their self-esteem, promote recovery, and build better relationships with patients, they cannot do so for various reasons. Therefore, there is a need for further studies to investigate the barriers and challenges that prevent nurses from providing nursing care with technology.

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Author's contribution

TY: Conceptualization, data collection, analysis, writing and revising the manuscript. TT: Conceptualization, data collection, analysis, writing and revising the manuscript. FB: Data collection, analysis, reviewing and revising the manuscript. YY: Conceptualization, reviewing and revising the manuscript. HI: Data analysis, reviewing and revising the manuscript. GP: Data collection, analysis, reviewing and revising the manuscript. MD: Data collection, analysis, writing, reviewing and revising the manuscript. RL: Conceptualization, analysis, writing and revising the manuscript. All authors agreed and approved the manuscript for publication.

Conflict of interest

None declared.

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ORIGINAL RESEARCH

Predictors of the Willingness to Promote Advance Care Planning among Nurses in Palliative Care Settings in Yogyakarta, Indonesia

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Abstract

Background: While previous studies showed that oncology nurses were highly inclined to promote advance care planning (ACP), there is a limited study focusing on ACP that concerns the willingness to promote ACP among palliative nurses in Indonesia. This issue needs to be investigated to determine the causative factors so that interventions for nurses can be arranged to improve ACP in Indonesia.
Purpose: This study aimed to identify predictors of the willingness to promote ACP among nurses in palliative care settings.
Methods: This study used a descriptive-analytical design with a cross-sectional approach. A total of 150 registered nurses with at least one year of experience were purposively recruited. Data were collected using the Indonesian version of the willingness to promote ACP instrument (I-WPACP) with a possible score range of 24 to 120; the higher the score, the higher the willingness to promote ACP. The descriptive statistic, independent t-test, Pearson correlation test, Spearman rank correlation test, and multiple linear regression test were used to analyze the data.
Results: The willingness to promote ACP showed a mean score of 84.73±9.36. The score indicates a high willingness to promote ACP. The experience of receiving palliative care education became a related factor as well as the most closely related factor to the willingness to promote ACP in the palliative care settings (β=0.184; p=0.028).
Conclusion: The willingness to promote ACP among nurses is high and closely related to their experience of receiving education about palliative care. Education about palliative care and training on ACP needs to be developed so that nurses can discuss ACP with patients and family caregivers.

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1. Introduction

In Indonesia, palliative care has been developing since 1992, with the Indonesian Ministry of Health launching a palliative care policy in 2007. Progress, on the other hand, has been slow and uneven across the country. Palliative care services are now only provided in a few major cities, where the majority of cancer treatment centers are located (Putranto et al., 2017). Palliative care has experienced a shift from its initial focus on patient's final stage of life to patients' onset early diagnosis (Connor & Bermendo, 2014). This approach aims to improve patient's and family's quality of life in facing a particular life-threatening illness through the prevention and discontinuation of suffering from earliest possible identification, conducting assessments, and optimal care to pain and other physical, psychological, social, and spiritual problems (Connor & Bermendo, 2014; World Health Organization [WHO], 2016). Palliative care is administered to patients with cardiovascular disease (38.5%), cancer (34%), chronic lung disease (10.3%), HIV/AIDS (5.7%), and diabetes (4.6%). Other medical conditions that require palliative nursing care are chronic kidney failure, chronic liver disease, rheumatoid arthritis, neurological disease, and dementia (Connor & Bermendo, 2014; Kelley & Meier, 2010). Attention is shifted to improving the quality of life rather than curing. "Good death" concept or died in good condition influenced patient's choices in maintaining their physical health status and decision making related to their end of life later (Dzeng et al., 2015).

In order to bridge palliative conditions, advance care planning (ACP) is considered as an appropriate approach to facilitate patients' health preference and end of life stage (Rietjens et al., 2017). ACP process is a communication procedure with patients, their loved ones, and health care

providers, in which they discuss the intended purpose and wish for care and treatment process (Rietjens et al., 2017). ACP can significantly increase the quality of life by focusing attention to hope at the end of life stage, reducing unwanted aggressive treatment (Robinson et al., 2012), and improving patient's and family's medical treatment satisfaction because it decreases anxiety and stress levels as well as depression from the family (Brinkman-Stoppelenburg et al., 2014; Institute of Medicine [IOM], 2015). ACP can also reduce the cost of health care (Yadav et al., 2017), reduce hospitalization rate, and lower unnecessary use of medical equipment and medicines (Dixon et al., 2015; O'Sulivan et al., 2016). However, in Indonesia, discussion about ACP is challenging. To discuss patients' health, preferred care, value and beliefs about patients' illness, expectations about treatment, and talking about death are still taboo. As a result, healthcare practitioners and caregivers in Indonesia must handle ACP especially about end-of-life topics with extreme sensitivity to avoid offending anyone (Silveira & Forman, 2012).

Nurses play a vital role in assessing patients' condition, initiator, information providers, educators, communicators, facilitators, advocators, and case managers in the ACP process (Ke et al., 2015). The willingness to promote ACP among nurses can be influenced by several factors such as knowledge about ACP, working experience, age, or education background (Tang et al., 2020). A study in China stated that nurses still have less than adequate knowledge of ACP. The result of the study showed that 60.1% of the total 293 nurses did not have exposure to education about palliative care, 89.1% did not have any experience in ACP training, and 72.7% did not have interest in the concept of ACP (Tang et al., 2020). Also, Izumi (2017) stated that 40% of nurses who had less knowledge on ACP reported that they had never or rarely been involved in ACP. Additionally, when they were involved, they were given obscure roles throughout the process.

Age and working experience were also linked with the willingness to promote ACP (Coffey et al., 2016). A study by Shepherd et al. (2018) and Hsieh et al. (2019) asserted that senior-aged nurses have more experience to participate in ACP. Senior-aged nurses who have long working experience possess better professionalism in managing patients, so they can be involved in the ACP process, discuss, and communicate with the patient confidently (Coffey et al., 2016; Hsieh et al., 2019; Shepherd et al., 2018). Senior nurses with a lot of experience are also better equipped to perform the termination of unnecessary medication at the patient's end-of-life stage in the palliative care setting (Coffey et al., 2016).

The previous study about willingness to promote ACP was conducted in China (Tang et al., 2020). The result showed that the oncology nurses were highly inclined to promote ACP, but limited by their knowledge about ACP. Studies focusing on ACP that are concerned with the willingness to promote ACP among palliative nurses in Indonesia are rarely conducted, especially in Yogyakarta. This matter needs to be investigated to determine the causative factors so that interventions for nurses can be properly arranged to improve ACP in Indonesia. These interventions can also be the following step to improve patients' and their family's quality of life. Accordingly, this study aimed to find out the predictors of the willingness to promote advance care planning among nurses in the palliative care settings.

2. Methods

2.1 Research design

This study was a descriptive-analytical study using a cross-sectional approach to determine the predictors of the willingness to promote advance care planning among nurses in the palliative care settings.

2.2 Setting and samples

This study was conducted among 150 nurses selected using a purposive sampling technique at two general hospitals in the Special Region of Yogyakarta, Indonesia. The calculation of the samples in this study was determined using a descriptive numerical axis with a 95% confidence level (Dahlan, 2016). The inclusion criteria were registered nurses in Indonesia with at least one year of experience of working in oncology care wards, palliative care units, or internal disease wards. Meanwhile, nurses who were off work or attending nursing training were excluded. Of the 150 distributed questionnaires, all respondents completed the questionnaire resulting 100% response rate.

2.3 Measurement and data collection

Because of the pandemic of the COVID-19 situation, all data were gathered utilizing Google Forms. Before data collection, orientation about the study was conducted to all respondents, including the purpose of the study, the risks and benefits, and the volunteerism in participation. The researchers personally conducted an orientation in each ward in the hospitals through head nurses. After that, the head nurses identified those nurses who met the inclusion and exclusion criteria and sent the Google form links. The nurses filled out the self-reported questionnaires, including the socio-demographic data, ACP knowledge, and willingness to promote ACP. The confidentiality of this study was guaranteed because the answers from the respondents through the Google form link were directly sent to the researcher's database. Data were collected on June 2021.

The self-reported questionnaires in this study consisted of three parts. First, there were the demographic characteristics, including age, gender, level of education, position title, and working experience. The second part was three questions to investigate the knowledge of ACP by Tang et al. (2020). The respondents were asked whether they had: (1) received palliative care education; (2) heard about ACP; and 3) received ACP training. The last part was the willingness to promote ACP (WPACP) instrument by Hsieh & Lin (2010). Permission to use the instruments was obtained from the original authors. The original version of WPACP was translated into Indonesian and re-named as the Indonesian version of WPACP (I-WPACP). The WPACP was translated using forward and back translation methods (Maneesriwongul & Dixon, 2004). Two translators translated the instruments from English into Indonesian language independently. The translation was reviewed by two bilingual nurses from Indonesia to fit the context and culture. The agreement resulted in the Indonesia version instruments that need to be back-translated. The back-translation process was done by a native English speaker. Furthermore, a discussion among the authors, native speaker, and Indonesian nurses was held to examine the similarities between the original and the back-translation versions. The result showed that the back-translation version was similar in meaning with the original one.

The next step was to do a construct validity on the 72 nurses. In this process, the nurses were recruited from the same hospital but were outside the research subjects. All the items in the I-WPACP instrument were confirmed to be valid and reliable, with Pearson-r values higher than 0.229 and a Cronbach's alpha coefficient of 0.743. I-WPACP consisted of 24 questions with five answer choices using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Item 1, 2, 3, 4, 6, and 9 should be forward scores because they are favorable items, whereas the remaining items should be reversed scores as they are unfavorable items. The possible score ranged from 24 to 120. A higher total score indicates a higher willingness to promote ACP.

2.4 Data analysis

The data entry and analysis in this study was conducted using the Statistical Package for Social Sciences (SPSS) version 21 (IBM SPSS, Chicago, IL, USA). Respondents' characteristics, knowledge about ACP, and willingness to promote ACP were analyzed using descriptive statistics. The normality of the numerical data was analyzed using the descriptive normality test. Mean values and Standard Deviation (SD) were used when symmetrical. Median values and Inter-Quartile Ranges (IQR) were used when skewed. In the bivariate analyses, an independent t-test was performed to analyze significant differences in willingness to promote ACP according to the demographic characteristics, such as gender, level of education, and position title, and the ACP knowledge such as experience to receive palliative care education, experience to hear about ACP, and experience to receive training about ACP. The Pearson correlation test was used to correlate the willingness to promote ACP with ages, and the Spearman rank correlation test was used to correlate the willingness to promote ACP with working experience. A multiple linear regression test was conducted to analyze the associated factors correlated with the willingness to promote ACP, with a *p*-value less than 0.05 was considered statistically significant.

2.5 Ethical considerations

This study received ethical approval from the Medical and Health Research Ethics Committee of the Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada Yogyakarta (Reference number: KE/FK/0313/EC/2021) and the Research Ethics Committee of PKU Muhammadiyah Yogyakarta Hospital (Reference number: 00165/KT.7.4/VI/2021). Prior to data

collection, the researchers ensured that each respondent had signed an e-informed consent form. Each respondent also had the ability to withdraw from the study at any time without penalty. Data confidentiality was also ensured.

3. Results

3.1 Demographic characteristics of the respondents

The respondents' characteristics are shown in Table 1. There were 150 consenting nurses included in the final analysis. The mean age was 36.47±9.36, while the median of the working experience was 11.00 years. The majority of nurses were female (80%), had a diploma's degree education (63.3%), and worked as associate nurses (78.7%).

Table 1. Demographic characteristics of the respondents (n=150)

Characteristics	f (%)	Mean±SD	Median (IQR)
Age (years)	-	36.47±9.36	
Working experience (years)	-		11.0 (3.0-21.0)
Gender		-	-
Male	30 (20)		
Female	120 (80)		
Level of Education		-	-
Diploma's degree	95 (63.3)		
Bachelor's degree	7 (4.7)		
Ners	46 (30.7)		
Master's degree	2 (1.3)		
Position title		-	-
Head of nurse	11 (7.3)		
Primary nurse	21 (14.0)		
Associate nurse	118 (78.7)		

SD=Standard Deviation; IQR=Inter Quartile Range

3.2 The knowledge of ACP

The knowledge of ACP is summarized in Table 2. Among the surveyed nurses working in two general hospitals, 66% had received palliative care education, 69.3% had ever heard about ACP, and 78.7% had never received ACP training.

Table 2. Knowledge of the ACP (n=150)

Variable	f (%)
Experience to receive palliative care education	
No	51 (34)
Yes	99 (66)
Experience to hear about ACP	
No	46 (30.7)
Yes	104 (69.3)
Experience to receive training about ACP	
No	118 (78.7)
Yes	32 (21.3)

ACP= Advance Care Planning

3.3 The willingness to promote ACP among nurses

The willingness to promote ACP among nurses is shown in Table 3. The mean score was 84.73±9.36 from possible score 24 to 120. That score indicates a high willingness to promote ACP among nurses.

Table 3. Willingness to promote ACP among nurses (n=150)

Variable	Possible score	Mean±SD
Willingness to promote ACP[a]	24-120	84.73±9.36

[a]Assessed using Indonesian version of Willingness to Promote Advance Care Planning Instrument; A higher total score indicates a higher willingness to promote Advance Care Planning; ACP=Advance Care Planning; SD=Standard Deviation

3.4 Predictors of the willingness to promote ACP among nurses

The willingness to promote ACP based on demographic characteristics and knowledge about ACP is summarized in Table 4. Four variables became the candidates for multivariable analysis because they had a *p*-value less than 0.25 (Dahlan, 2014). They were age (*p*=0.043), working experience (*p*=0.063), level of education (*p*=0.036), and experience to receive palliative care education (*p*=0.013).

Table 4. Willingness to promote ACP based on demographic characteristics and knowledge about ACP (n=150)

Variable	Mean±SD[a]	Correlation coefficient (*r*)[b]	*p*-value
Age (years)	-	0.597	0.043*
Working experience (years)	-		0.063
Gender		-	0.854
Male	84.47±10.37		
Female	84.80±8.43		
Level of Education		-	0.036*
Diploma's degree	83.59±8.95		
Bachelor's degree, Ners, and Master's degree	86.71±9.43		
Position title		-	0.411
Head of nurse	81.73±12.36		
Primary nurse and associate nurse	84.97±8.49		
Experience to receive palliative care education		-	0.013*
No	82.08±9.78		
Yes	86.10±7.98		
Experience to hear about ACP		-	0.585
No	85.33±7.31		
Yes	84.47±9.42		
Experience to receive training about ACP		-	0.410
No	84.42±8.65		
Yes	85.88±9.43		

[a]Independent t-test; [b]Pearson correlation or Spearman rank; *p-value <0.05 indicate statistically significant; SD=Standard Deviation; ACP=Advance Care Planning

Four candidate variables were analyzed together using a multiple linear regression test as shown in Table 5. The result showed that the experience of receiving palliative care education became a related factor as well as the most closely related factor to the willingness to promote advance care planning in the palliative care setting (β=0.184; *p*=0.028).

Table 5. Predictors of the willingness to promote ACP among nurses (n=150)

Variable	B	*B*	*p*-value	95% CI
Constant	75.517		<0.001**	66.288; 84.747
Age	-0.019	-0.020	0.865	-0.236; 0.199
Working experience	0.085	0.118	0.306	-0.079; 0.248
Level of Education	2.276	0.125	0.145	-0.793; 5.346
Experience to receive palliative care education	3.410	0.184	0.028*	0.371; 6.449

ACP=advance Care Planning; *β*=Standardized Coefficient; CI= Confident Interval; **p*-value <0,05 indicate statistically significant; ***p*-value <0,01 indicate statistically significant; Adjusted R Square=4.7%

4. Discussion

This study aimed to find out the predictors of the willingness to promote ACP among nurses in palliative care settings. The results indicated high willingness to promote ACP. In this study, the majority of respondents have had education on palliative care. This finding is in contrast with

a study by Tang et al. (2020) in China, which reported that the majority of nurses never received nursing education on palliative care. The majority of Indonesian nurses have received education on palliative care due to its inclusion in the nursing education curriculum, in which the topic of ACP is also covered. Nurses' knowledge of palliative care, especially about ACP, will influence their role and involvement in patients' end-of-life care (Coffey et al., 2016). In line with this research is a study by Coffey et al. (2016) which was conducted in five countries: Hong Kong, Ireland, Israel, Italy, and the United States, showing that nurses in the United States have better knowledge and experience on ACP than the other four countries. The high knowledge and experience of nurses in the United States resulted in a positive impact on the confidence and ease in the process of caring for patients in their final stage of life.

This study found that the majority of nurses have never had training on ACP. This result is in line with a study by Hsieh and Lin (2010) in Taiwan, which found that most nurses did not receive any training in communicating with patients about death and dying. Even though nurses receive education on palliative care and ACP, but when the skills in ACP are not further developed, it can cause disruption in the implementation of ACP in patients. The disruption can be in the form of a lack of communication skills concerning decisions in patients' end-of-life treatment (Montagnini et al., 2012). Also, nurses' lack of skills in ACP creates difficulty in caring for patients' daily care (Hsieh et al., 2019), and prevents them from participating in patients' ACP at their final stage of life (Izumi, 2017).

There is a need for comprehensive education and training in ACP for nurses in the palliative care system (Cohen & Nirenberg, 2011; Hsieh et al., 2019). The goal is to ensure that the nurses' knowledge can be utilized in ACP implementations. When that goal is achieved, it results in the appropriate communication process that can be well examined and support nurses in establishing discussion with patients and their families (Fan & Rhee, 2017; Shepherd et al., 2018; Tang et al., 2020). Training programs for skills on ACP, which are recommended for medical staff, can be in the form of audiovisual training using DVD, e-interactive simulation, workshop, and conventional training (Detering et al., 2014).

In this study, nurses' level of willingness to promote ACP in the palliative care setting is high. This result is also in line with a study on willingness to promote ACP conducted on health care providers, cancer patients, family caregivers, and the general population in South Korea (Park et al., 2019). Park et al.'s finding (2019) showed that among the four groups, the general population group had the lowest willingness. Meanwhile, the health care providers had the highest willingness to promote ACP. Nurses, as health care providers, who have a relatively close relationship with patients and family caregivers could be assumed as acquainted with their conditions and intention compared to other health care providers. With that closeness, ACP implementation is easier to achieve (Rietze et al., 2016). The low willingness to promote ACP is due to several factors: having different considerations when facing actual situations related to their illness, discomfort when thinking about terminal illness, and feeling uncertain whether their decision is appreciated at the due time (Park et al., 2019).

Factors that are related to the nurses' willingness to promote ACP in the palliative care setting in this research are the nurses' age, working experience, education level, and experience in receiving education on palliative care. However, when these four factors are linked to the willingness to develop ACP, the factor of experience in receiving education about palliative care is the strongest factor related to the nurses' willingness to promote ACP. It shares similarities and differences with a study by Tang et al. (2020), which was conducted on nurses in China and found that several factors determine nurses' willingness to perform ACP, including nurses with higher positions and have longer working experiences. Nurses who have heard about ACP, and those who have had an experience of training for ACP are also factors that are linked to their willingness to promote ACP (Tang et al., 2020). In Tang et al.'s study (2020), nurses who had received education on palliative care have a higher education background and have a higher nursing career level that allows them to get education on ACP. Nurses who have a higher position in their nursing career also have access to study and receive training on ACP.

This study found that the senior-aged nurses and the nurses who have long working experience possess higher willingness to promote ACP even though these two factors were not the strongest factors linked to the nurses' willingness to promote ACP. This result agrees with a study by Shepherd et al. (2018) among nurses in Australia and a study by Hsieh et al. (2019) in Taiwan. Both studies asserted that senior-aged nurses have more experience to participate in ACP. A study

by Coffey et al. (2016) that was carried out in five countries: Hong Kong, Ireland, Israel, Italia, and the United States, also showed similarity with this research. Senior-aged nurses who have long working experience possess better professionalism and confidence in managing patients' symptoms at their final stage of life and are better equipped to perform the termination of unnecessary medication at patient's end of life stage in the palliative care setting (Coffey et al., 2016).

This study also found that nurses who have higher education and have received education on palliative care possess a higher willingness to promote ACP. Among the two factors mentioned, receiving education on palliative care was the strongest factor linked to nurses' willingness to promote ACP. However, this finding differs from Tang et al.'s study (2020), which asserted that both factors were not linked to nurses' willingness to promote ACP in China. The assertion on the absence of correlation between the two factors and the nurses' willingness is due to nursing education curriculum differences in China that only lightly imposed subjects that are related to humanistic nursing, such as palliative care, but imposed more on clinical practice ability.Experience of getting an education on palliative care is the most closely related factor linked to nurses' willingness to promote ACP because of the nurses' perceptions and self-confidence in providing care. Nurses who adhered to the palliative concept, more precisely the ACP concept, were more confident and more at ease in communicating with patients when discussing ACP (Coffey et al., 2016). Education on palliative care, especially about ACP, needs to be given when nurses were still in both their undergraduate and postgraduate education (Shepherd et al., 2018), combined with ACP training when nurses were already assigned with their job in the clinic, especially in the palliative care setting. A previous study by A'la et al. (2018) asserted that there was a correlation between the experiences and student academic level and the students' attitudes in caring for dying patients. The experiences and academic level of the students play a major role in their views towards caring for dying patients. From this point of view, exposure during the education and developing it in the hospital system through training can help to strengthen consistent implementation of ACP (Gillan et al., 2014). In light of this phenomenon, it is appropriate to urge that undergraduate and postgraduate-levels include ACP education in all nursing study programs prior to legislation being enacted (Coffey et al., 2016). The education has to focus on the nurses' perception of palliative care aspects to assist patients and their families in understanding and participating in ACP. Also, the education is to facilitate decision making, symptom management, procedures for patients' comfort status, and psychological support (Chan et al., 2014).

5. Implications and limitations

ACP is a valuable process in which nurses are highly active and play a key role in the discussion. Approaching ACP with good education and training is an excellent opportunity to embed the process of ACP into practice. Given their critical role in assisting patients and acting as decision-makers, nurses require further training and assistance to ensure that they have a thorough understanding of ACP procedures, including how, when, and with whom wishes should be discussed and carried out. When establishing ACP education programs, take into account the higher levels of knowledge among older and more experienced nurses. Also, based on the result of this study, it is better to ensure that ACP education is accepted at the undergraduate and postgraduate levels in all nursing education programs in Indonesia. Also, training about ACP is needed to gain communication skills, so the nurses are confident to discuss with the patient and family in the clinical setting.

This study has two main limitations. First, this study was conducted in two general hospitals that did not specifically have a palliative care ward. There might be a different result on knowledge about ACP if the study takes place in the palliative ward. Second, this study only used a simplified questionnaire to measure the knowledge of ACP. However, this study has an appropriate sample size to capture the goal of this study.

6. Conclusion

This study concludes that the willingness to promote ACP among nurses is high and closely related to their experience of receiving education about palliative care. Education about palliative care, especially ACP, is vital to be given when nurses were still in their undergraduate or postgraduate education process. Aside from that, training about ACP needs to be developed

further to make nurses skilled in communicating and performing discussions about ACP with patients and family caregivers. Willingness to promote ACP, aside from being investigated on nurses, can also be explored further in patients and family caregivers. Thus, individuals who are involved in ACP can well discuss and communicate to achieve a better quality of life. Moreover, the I-WPACP measuring tool is very much recommended to be used in investigating nurses' willingness to promote ACP in the palliative care setting. The result of this measurement can be used as the foundation for ACP training for nurses in the palliative care setting.

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Author contribution

The authors IWWS and RWH, all contributed significantly to the study's conception and design. IWWS developed the study, participated in its design and coordination, gathered data, participated in the statistical analysis, and draft the manuscript. RWH participated in the design and coordination of the study and helped draft the manuscript. Furthermore, all authors give final approval of the final manuscript submitted in this journal.

Conflict of interest

There are none to declare.

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REVIEW

Assessment of Interprofessional Education (IPE) in Community Settings: A Systematic Review

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Abstract

Background: An assessment of methods and tools in interprofessional education (IPE) needs to be conducted to guarantee that the set learning objectives (LOs) or competencies are achieved, especially in community settings. This assessment is essential since in community settings, facilitators and students are not in the same frame, while direct observation is preferable in IPE. The implementation of methods and tools for assessment varies. Mostly, the assessment does not cover all competencies of IPE. Further identification of the way the assessment is conducted as well as the IPE competencies assessed is pivotal.
Purpose: This study aimed to review the implementation of IPE in community settings, especially the assessment conducted on the methods and tools used along with the assessors involved and the competencies achieved.
Methods: A systematic review was employed as a method in this study. Relevant articles from Science Direct, MEDLINE, CINAHL, and Scopus were screened based on the inclusion criteria: publication between 2010–2020, research and review articles, full-text articles, conducted in community settings, and involved assessment in acquiring the competencies. This review included 12 out of 1,273 screened articles. The articles were analyzed qualitatively by identifying the keywords, categories, and themes.
Results: The results showed the assessment conducted and the competencies achieved in IPE. The assessment included methods and tools as well as the assessors involved. Most existing studies used students' perceptions or reflections as the methods and involved less assessors such as supervisors or family members. Meanwhile, the assessment tools focused on certain competencies, such as roles and responsibilities, ethics and values, teamwork, and communication. However, no study assessed all competencies.
Conclusion: The analysis resulted in two large topics, i.e., the assessment, which includes the assessment methods and tools as well as assessors involved, and the competencies achieved. It is recommended to conduct further studies to develop objective assessment methods, comprehensive assessment tools, and generic competencies or learning outcomes.

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1. Introduction

Interprofessional Education (IPE) is increasingly viewed as essential to health care education and is associated with an increase in the quality of care through the improvement of the behaviors of the health care team in conducting collaboration (Riskiyana et al., 2018). IPE is a learning process in which students from various health disciplines collaborate to provide health care services to patients with the goal of enhancing the quality of care (Kelly, 2010). IPE is a form of collaboration which can be practiced by students in delivering health care services (Horder, 2004; McPherson et al., 2001; Perkin, 2011). Collaborations and teamwork should be introduced to the students in the academic phase before exposure in the clinic as they build a culture of collaboration and communication (Curran et al., 2010). Many studies show that IPE has a positive effect on students when it is implemented during the pregraduate phase. It contributes to improved teamwork (Wagner et al., 2011); collaboration, coordination, holistic intervention, patient management, and services (Opina-Tan, 2013); improved skills, knowledge, and attitudes toward collaboration (Claramita et al., 2014); strong confidence in communication (Carr, 2015); and understanding of roles and responsibilities (Hammick et al., 2007).

IPE is a learning approach, and thus, its outcomes or competencies need to be assessed. Interprofessional Education Collaborative (IPEC) issued details on IPE competencies, namely values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, and teams and teamwork (Schmitt et al., 2011). However, some studies stated that the competencies could be broader such as for teamwork, roles and responsibilities, communication, learning/reflection, patient, and ethics/attitudes (Thistlethwaite & Moran, 2010). Meanwhile, some studies only focus on specific competence, such as collaboration (Haruta et al., 2019; Findyartinia et al., 2019).

Furthermore, in the assessment, both methods and tools are employed to guarantee that the set learning objectives (LOs) or competencies of IPE are achieved. It can be conducted for formative and summative purposes. Formative assessment is conducted during IPE to give feedback to students so they can improve their performance while summative assessment gives a final score and decides the students' achievement of LOs (Oktay et al., 2017). For example, self-reported assessment and assessment based on students' reports can be applied in IPE (Allvin et al., 2020; Lapkin et al., 2013). However, the assessment needs to use objective measurement to identify the achievement of learning outcomes rather than just students' self-assessment (Shumway & Harden, 2003; Anderson & Kinnair, 2016). Furthermore, an integrative portfolio can be used as a formative assessment (Anderson & Kinnair, 2016) and mentoring for students (Mollahadi et al., 2018) because it invites feedback from peers and supervisors which can help improve students' performance (Bok et al., 2013; Driessen et al., 2007). However, IPE in the community needs specific attention because supervisors cannot stand by along with students as they would in the clinical setting. Thistlethwaite et al. (2014) stated that direct observation is the most preferable method in IPE assessment; however, the limited opportunities for students and facilitators make it hardly viable to commence. Some studies reported that IPE along with the assessment therefor has been implemented in hospitals. McCharty et al. (2014) implemented IPE in hospitals for maternal acute illness management. It involved students doing self-reflection in identifying the changing roles of health professionals (doctors, nurses, and midwives). Meanwhile, Walker et al. (2014) involved supervisors or trainers to assess teamwork improvement during the training of obstetric and neonatal emergencies. This is why IPE needs a comprehensive assessment that involves many sources to ensure that students master the competencies. Epstein (2007) and Oktay et al. (2017) stated that the involvement of many sources in IPE assessment renders the process more objective. It is also emphasized by Thistlethwaite (2012) that one of the biggest challenges for interprofessional educators is to develop assessment for IPE outcomes, particularly teamwork and skills for collaborative practice.

Knowledge about IPE assessment, especially its process and competencies in the community setting, is limited. Shrader et al (2017) investigated assessment tools used to evaluate IPE's learning outcomes in the pharmacy education setting, while Riskiyana et al. (2018) conducted a systematic review to investigate IPE outcomes. For that reason, this study is conducted to investigate the assessment for methods and tools applied as well as the assessors involved in the comprehensive assessment of IPE implementation particularly in the community setting. A suitable assessment method that involves many sources is preferable since it makes the process more objective (Almoghirah et al., 2021). It is important to investigate the assessment as there is a limited number of publications that covers a tool that can be used to assess all competencies (Almoghirah et al., 2021; Shrader et al., (2017). Finally, the assessment has considerable potential to drive learning (Wiliam, 2011). A validated and reliable assessment method and tool will encourage students to participate in a quality learning process and master competencies. Accordingly, this review aimed to investigate IPE implementation in the community settings, including assessment methods and tools used, assessors involved and competencies achieved. Two research questions were posed in this study, including: (1) How is the assessment of IPE (including the way the methods and tools are used and the way the stakeholders/assessors are involved) conducted? and (2) What are the competencies or learning outcomes achieved?

2. Methods

2.1 Research design

A systematic review was implemented as a method in this study. It helped to identify the existing studies on the same topic and to extract them to create a conclusion. Furthermore, it was

determined using PICO (Population, Intervention, Context, and Outcomes) following specific criteria as shown in Tabel 1.

Table 1. Description of PICO

Population	Health care students and facilitators exposed to IPE (nursing, medical, midwifery, nutrition)
Intervention	Assessment of IPE
Context	IPE program in the community setting
Outcomes	Reflection of IPE implementation including the assessment methods and tools used along with the assessors involved and the competences achieved

2.2 Search methods

The existing electronic databases were used to search the articles, including Science Direct, CINAHL, MEDLINE, and Scopus. They can be accessed in the digital library of the university. Articles were identified using Boolean operator 'and' and 'or' to combine the keywords;

1. interprofessional education$
2. health student$
3. nursing
4. medicine
5. midwive$
6. midwifery
7. Assessment
8. Method$
9. Tool$
10. competencies
11. community.

2.3 Inclusion and exclusion criteria

The relevant articles were selected by applying the inclusion and exclusion criteria. These articles were published between 2010–2020, were research and review articles, could be accessed as full texts, focused on the assessment methods and tools, and covered studies implemented in a community setting. Articles covering IPE implementation in clinical settings were excluded. The articles used were only those published within ten years to ensure their relevance. For articles screening, the PRISMA flowchart (Figure 1) was used. The process was broken down into four steps, namely identification, screening, eligibility validation, and inclusion (Page et al., 2021).

2.4 Screening for articles

Rayyan® software was used to screen the articles. Three authors (FYA, DNA, and DPD) identified the title, abstract, and keywords by applying the inclusion criteria after duplications were removed. The process was then continued with the identification of full articles. The review was conducted independently. Disagreement during the review was settled through consultation with the fourth author (TNK).

2.5 Data extraction

The articles selected (12 articles) were examined qualitatively through the identification process based on some information, i.e., title & author, objectives, setting, design, assessment methods, assessment tools, assessors, and competencies. Keywords and themes were extracted from the articles. Three authors (FYA, DNA, and DPD) identified all included articles based on the foregoing categories and summarized them in a table (Table 3, see Appendix 1).

2.6 Quality appraisal

Critical appraisal needed to be conducted in a systematic review as it identifies the quality of the studies covered therein (Aromataris et al., 2015). Table 2 shows the result of the critical appraisal conducted in this study. The process was conducted by two authors (FYA and TNK). Six studies were verified using a checklist of quasi-experiment studies; three studies were verified

using a checklist of qualitative studies; and three used mix-method studies. The answer of yes was scored 1, while the answer of no, unclear, and not applicable was scored 0. The scores were interpreted based on a study by Reilly et al. (2016), which indicates that studies are good if the total score is >80%, fair if the total score is 50–80%, and poor if the total score is <50%.

Table 2. Level of critical appraisal

No	Author, year	Critical appraisal
1	Opina-Tan (2013)	Good
2	Housley et al. (2018)	Good
3	Gallagher et al. (2015)	Fair
4	Soliman et al. (2012)	Fair
5	Haruta et al. (2018)	Fair
6	Haruta et al. (2019)	Good
7	Ryan et al. (2015)	Fair
8	Sullivan et al. (2015)	Good
9	Dressel et al. (2017)	Good
10	Randita et al. (2019)	Good
11	Findyartinia et al. (2019)	Fair
12	Walker et al. (2019)	Fair

2.7 Data analysis

Nine steps of synthesis without meta-analysis (SWiM) in a systematic review (Chambell et al., 2020) was used as guidance in data analysis. Step 1 is grouping the studies. The selected studies were grouped under several items namely author & year, objectives, setting, design, assessment methods, assessment tools, assessors, and competencies. Steps 2–6 were conducted to answer review questions. The similarities and differences especially related to the assessment methods, assessment tools, assessors involved, and competencies acquired were identified. The findings were formulated based on the keywords for the categories. The findings were categorized under two major themes namely assessment process and competencies acquired. The findings were then put in the table, indicating the groups of the studies and themes (step 7). The presentation and discussion of the results and identification of limitations made up the steps 8 and 9, respectively. Furthermore, the recommendation for further research or better IPE implementation was proposed.

3. Results

3.1 Characteristics of the selected studies

Twelve articles were selected in the screening process. These articles were identified based on certain criteria, such as author & year, objectives, setting, design, assessment methods, assessment tools, assessors, and competencies (Table 3). Nine of the 12 articles covered a study conducted in the community setting (Housley et al., 2018; Gallagher et al., 2015; Soliman et al., 2012; Haruta et al., 2018; Haruta et al., 2019; Ryan et al., 2015; Sullivan et al., 2015; Dressel et al., 2017; Randita et al., 2019; Findyartinia et al., 2019), two articles covered a study conducted in rural or community hospitals or clinics (Haruta et al., 2019; Walker et al., 2019), and one article covered a study conducted in a family setting (Opina Tan, 2013). Additionally, most studies were conducted using a quantitative method (Soliman et al., 2012; Haruta et al., 2019; Ryan et al., 2015; Sullivan et al., 2015; Dressel et al., 2017; Randita et al., 2019), while Opina-Tan (2013), Findyartinia et al. (2019), Walker et al. (2019) used mix method and Housley et al. (2018), Gallagher et al. (2015), and Haruta et al. (2018) applied qualitative research.

The PRISMA flowchart was applied to describe the process of article selection until their final inclusion (Figure 1).

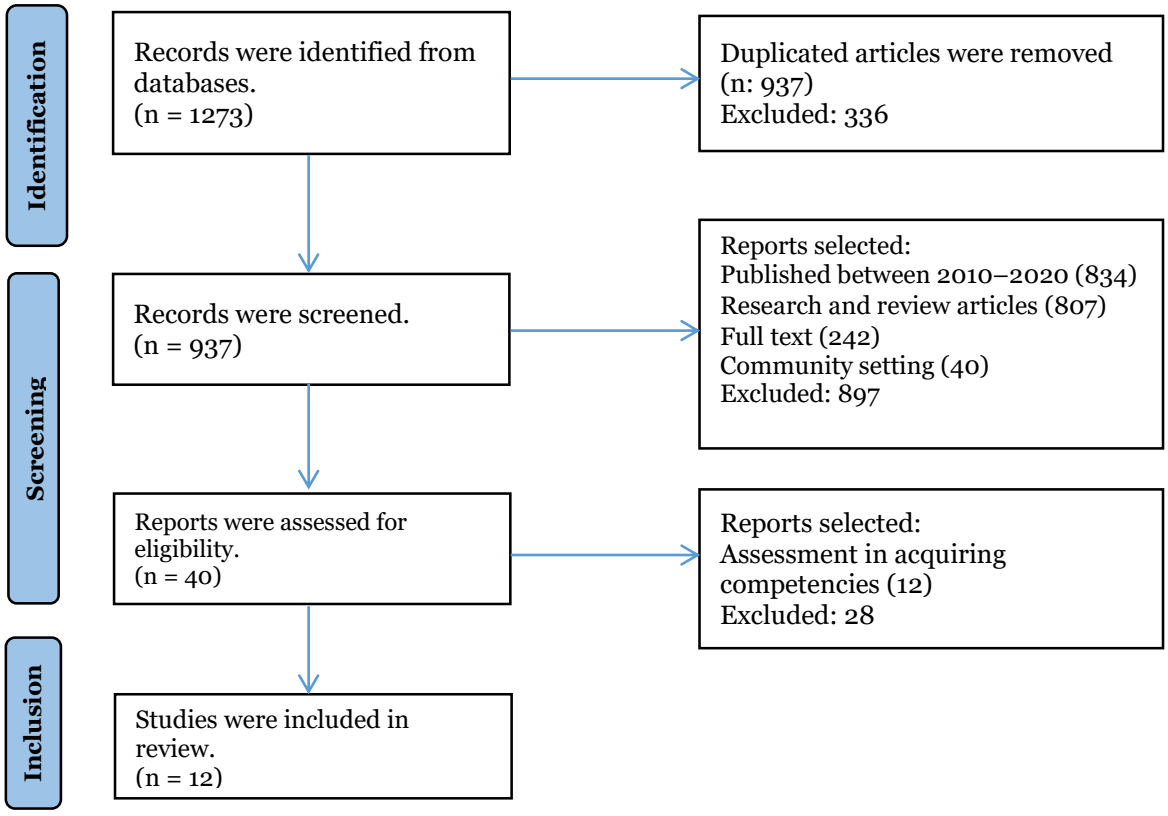

Figure 1. Study selection process

According to Figure 1, it can be seen that 1,273 articles were found during the identification process through the application of keywords (stage 2) using four electronic search engines (Science Direct, MEDLINE, CINAHL, and Scopus). Then, certain criteria were used to screen the articles. About 834 articles were published between 2010–2020, 807 articles were research or review articles, and 242 articles could be accessed as full texts. The next step was identifying the setting of the study; 40 studies were implemented in the community setting. The last step was the eligibility validation. Twelve out of 40 articles focusing on the assessment of the acquired competencies were included as final articles. Finally, the results were analyzed qualitatively through keywords, categories, and themes (Table 4).

3.2 Assessment process

Based on the results, the assessment process was divided into three components, namely assessment tools, assessment methods, and assessors or persons who assess the students. There were two types of assessment tools namely quantitative standardized assessment tool (Opina Tan, 2013; Haruta et al., 2019; Sullivan et al., 2015; Dressel et al., 2017; Findyartinia et al., 2019; Randita et al., 2019; Ryan et al., 2015) and qualitative tools (Housley et al., 2018; Gallagher et al., 2015; Haruta et al., 2018; Findyartinia et al., 2019; Walker et al., 2019). Ten of the twelve studies involved students in doing the assessment, while the rest invited health care providers as assessors (Haruta et al., 2018; Findyartinia et al., 2019). In addition to assessment tools, assessment methods were implemented in two ways namely self-reflection or self-assessment and discussion through Focus Group Discussion (FGD).

Table 4. Synthesis of findings

Finding 1 (keywords)	Finding 2 (Categories)	Finding 3 (Themes)
Family Case Management Questionnaires (FCMQ)	Assessment tools	Assessment process
Written reflective statements		
Questionnaires for survey		
Assessment of Interprofessional Team Collaboration Scale (AITCS)		
Students Attitudes Toward Community Service Survey		
Readiness for Interprofessional Learning Scale (RIPLS)		
Questionnaires for values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, and teams and teamwork		
Intercollaborator Assessment Rubric		
Collaborative Practice Assessment Tool (CPAT)		
Readiness for Interprofessional Learning Scale (RIPLS)		
IEPS		
Self-reflection	Assessment methods	
Self-administered		
Group discussion		
Observation		
Personal interviews		
Students	Assessor	
Supervisor		
Community provider		
Health professions		
Learning about collaboration	Collaboration	Competencies assessed
Collaborative practice in the rural IPE program		
Working in interprofessional teams		
Collaboration		
Collaborative practice		
Appreciation of roles	Roles and responsibilities	
Holistic care		
Service to the community		
Living with and learning from each other		
Skill teaching		
Knowledge sharing		
Self discovery		
Role discovery		
health is a holistic concept		
Patient-/client-/family-/community-centered		
Role contribution		
A nursing profession		
Incorporating patients' beliefs and personal beliefs into medical care		
To explain the roles and responsibilities of other care providers		
Works together to provide care		
Roles and responsibilities		
Collaborative patient-centered approach		
patient-involvement		
The roles of other professions		
Communicating with patients	Ethics and values	
Sensitivy to diversity		
Barriers to healthcare		
Greater job satisfaction		

Table 4. Continued

Finding 1 (keywords)	Finding 2 (Categories)	Finding 3 (Themes)
To place the interests of patients and populations at the center of interprofessional healthcare delivery.		
Socio-cultural factors such as uncertainty, avoidance tendency, power differentials, and collectivist culture		
Teamwork building	Team and teamwork	
Facilitation of relationships		
Better relationships with neighboring facilities		
Working with diverse communities and patients,		
Interprofessional teamwork		
Integrating the knowledge and experience of other professions		
Appropriate to the specific care situation		
To inform care decisions		
Respecting patient and community values and priorities/preferences for care.		
Team functioning		
Leadership and vision–mission–aims		
Decision-making		
Enhanced interprofessional engagement		
Interprofessional communication	Communication	
Reflection		
Understanding of others		
Skill in listening actively		
Encouraging ideas and opinions of other team members		
Conflict management		
Communication		
Unique learning experience	Learning experience	
Learning in the workplace		
Quality of a positive learning ambiance for students		
Observing role modeling in the workplace		

3.3 Competencies acquired

All studies investigated the competencies acquired during the implementation of the IPE program. The competencies achieved varied. According to Table 4, there were mostly five competencies investigated, namely collaboration (Opina Tan, 2013; Soliman et al., 2012; Randita et al., 2019; Walker et al., 2019); ethics and values (Housley et al., 2018; Haruta et al., 2019; Findyartinia et al., 2019); roles and responsibilities (Opina Tan, 2013; Gallagher et al., 2015; Housley et al., 2018; Haruta et al., 2018; Haruta et al., 2019; Ryan et al., 2015; Randita et al., 2019; Walker et al., 2019); team and teamwork (Housley et al., 2018; Haruta et al., 2018; Haruta et al., 2019, Sullivan et al., 2015; Dressel et al., 2017; Randita et al., 2019; Findyartinia et al., 2019; Walker et al., 2019); communication (Housley et al., 2018; Haruta et al., 2018; Randita et al., 2019); and learning experience (Opina Tan, 2013; Gallagher et al., 2015; Walker et al., 2019). Some studies covered several competencies. No study covered all competencies in its assessment.

4. Discussion

This study aimed to review the implementation of IPE in community settings, especially related to the IPE assessment and competencies achieved. Two general themes were resulted, namely assessment and competencies that are further discussed in this section. The assessment involves assessment method, assessment tool, and assessors, while the competencies consist of six elements, i.e., collaboration, roles and responsibilities, ethics and values, communication, team and teamwork, and learning experiences.

4. 1 Assessment

The assessment is concluded as a theme based on the assessment methods, assessment tools, and assessor categories (Table 3). Mostly, the assessment method involves students as the individual participant who gives response during assessment such as self-assessment or self-administered assessment (Opina Tan, 2013; Soliman et al., 2012; Haruta et al., 2019; Ryan et al., 2015; Dressel et al., 2017) and group discussion about students' reflection on IPE implementation (Housley et al., 2018; Gallagher et al., 2015; Haruta et al., 2018; Sullivan et al., 2015; Findyartinia et al., 2019; Walker et al., 2019). Further, there are two studies which involved supervisors to do an assessment (Haruta et al., 2018; Findyartinia et al., 2019). Self-assessment and group discussions make up a single assessment method which engages students as a subject of assessment. However, this method needs to involve more than one assessment subject to ensure a higher level of objectivity in the process (Epstein, 2007). It is recommended to involve many assessors in the assessment of IPE.

Multisource Feedback (MSF) is a method that can be applied to ensure the objective assessment of IPE as it involves students, peers, and patients to give feedback (Epstein, 2007; Riveros et al., 2016). Furthermore, MSF can be applied in formative and summative assessments (Davis et al., 2009; Kiessling et al., 2017). When applied in formative assessment, students will be given feedback so they can improve their performance (Oktay et al., 2017). However, some studies stated that MSF is applied for a single profession. For instance, Davies and Archer (2005) stated that doctors who lacked self-confidence could be helped by MSF and were then able to develop communication with patients and colleagues (Kiessling et al., 2017). Meanwhile, Asmara and Santoso (2015) stated that MSF is an effective assessment method to improve the professional behavior of nursing students. Considering the benefits of MSF and its feasibility, it is suggested to implement MSF as an assessment method for IPE implementation. This initiative is echoed by McKenzie et al. (2014), who noted that MSF not only prompts the students but also program designers, such as faculty members and supervisors to reflect on their collaboration process.

This review also showed that the assessment tools used in the existing studies vary. They used questionnaires or a set of questions to assess IPE learning outcomes or competencies. For instance, Haruto et al. (2019) used questionnaires of Assessment of Interprofessional Team Collaboration Scale (AITCS) and Findyartinia et al. (2019) used the Collaborative Practice Assessment Tool (CPAT) to assess collaborative competencies, whereas Ryan et al. (2015) used questionnaires of the Students Attitudes toward Community Service survey to gather data on the students' experience related to interprofessional competencies. On the other hand, open-ended questions were used to encourage students to give descriptive responses. This type of question was used by Dressel et al. (2017) to assess students' achievement on IPE competencies. Meanwhile, Housley et al. (2018) applied written reflective statements to describe learning outcomes in interprofessional practice. A questionnaire is more precise to assess the achievement of LOs or competencies because it is more valid and reliable than qualitative tools. Even though open-ended questions used as guidance during the group discussion can elaborate on students' reflection, this type of question has a lower degree of validity and reliability. Some studies used a combination of two tools, namely questionnaires and open-ended questions; however, this combination only identified one of the IPE competency domains (Opina-Tan, 2013; Findyartinia et al., 2019; Walker et al., 2019).

The majority of the existing studies assessed only a single competence. For instance, Haruta et al. (2019), Randita et al. (2019), and Findyartinia et al. (2019) assessed collaboration as an achieved IPE competence, while Walker et al. (2019) and Sullivan et al. (2015) used the Readiness for Interprofessional Learning Scale (RIPLS) to assess students' readiness to join IPE program. However, Dressel et al. (2017) assessed four competencies according to IPEC (2011).

Developing an assessment tool that is applicable for all IPE competencies in the community setting or primary health care is important (Vyt, 2017). A comprehensive assessment tool containing all IPE competencies will help both students and supervisors to identify the achievement.

4. 2 Competencies

As shown in Table 4, competencies are divided into collaboration, roles and responsibilities, ethics and values, communication, team and teamwork, and learning experience. The existing studies used competencies by IPEC (2011) in their assessment namely Values/Ethics for

Interprofessional Practice, Roles/Responsibilities, Interprofessional Communication, and Teams and Teamwork (Housley et al., 2018; Dressel et al., 2017). Shannon et al. (2017) and Dole et al. (2021) supported the finding that communication and teamwork are important in a team of people across health professions. Furthermore, Taekman et al. (2017) stated that roles and responsibilities of each health profession could be learnt through IPE. It was elaborated by Schmitt et al. (2011) that Values/Ethics for Interprofessional Practice is the ability to work with other professions to build a climate of mutual respect and shared values, while Roles and Responsibilities means giving health services based on patients and the community's needs using the knowledge of single profession's roles and other professions. Furthermore, communication with patients, families, communities, and people of other health professions as a team in the attempt to help patients solve their health problems is the focus of Interprofessional Communication, while implementation of values and principles of the team to assess, plan, and deliver treatment to patients, families, and communities is the focus of Teams and Teamwork competencies. Some studies covered broader competencies. For instance, Randita et al. (2019) added team functioning and conflict management as competencies of the IPE program in the community setting. However, other studies only focused on certain competencies. For instance, collaboration was the main competency of the IPE program in the study by Haruta et al. (2019) and Findyartinia et al. (2019), while Walker et al. (2019) added observing role model as a learning experience, and Opina-Tan (2013) stated gaining unique learning experience as an IPE competency.

Competencies of the IPE program in a community setting need to be set to be more specific and generic, so they can be used in all IPE implementations. Generic LOs will be a guide for students and supervisors in IPE implementation. Perron et al. (2014) stated that clinical skills needed in IPE implementation in the community setting, more specific in the gathering and assessment of information, cover performing a physical examination using clinical reasoning and judgment. Clinical reasoning and interprofessional behavior, which are parts of interprofessional attitudes and perceptions, have also been recommended to be included in IPE competencies by Seif et al. (2014). Furthermore, Oelke et al. (2013) argued that cultural competencies can be included as competencies in Interprofessional Collaboration Practice in the relationship between health care providers and patients or community or among them. It will support the competencies in interprofessional communication.

IPE is a learning process in which students from various health disciplines collaborate to provide health care services to patients and its goal is to increase the quality of care. Many studies have shown that IPE has a positive effect on students when it is implemented during undergraduate training. IPE contributes to improved collaboration, coordination, patient management, holistic intervention, and services (Opina-Tan, 2013). It is also associated with better skills, knowledge, and attitudes in collaboration (Claramita et al., 2017), strong confidence in communication (Carr, 2015), and understanding of roles and responsibilities (Hammick et al., 2007). Therefore, IPE needs to be implemented in the academic phase before students join an internship.

However, it is important to set the ideal IPE assessment components. They are assessment and competencies. Generic and specific competencies or learning objectives need to be defined, so they can be used widely in the community setting. Then, the assessment, including assessment methods and tools, needs to be improved. Objective assessment methods are preferable to evaluate students' achievement on IPE competencies, while a comprehensive assessment tool is needed to realize a better assessment.

5. Implications and limitations

The result of this review implies on the assessment of the learning process, especially IPE. There are varieties of methods and tools offered to assess students' achievement on IPE competencies. Faculty members can develop and modify the program based on the results. Furthermore, the assessment process, including methods, tools, and assessors, can be implemented in other subjects, for instance, nursing. However, competencies are specifics for each subject. Therefore, it needs to adjust to the learning objectives.

This review has limitations. The included articles were limited to those published in English to accommodate the language competencies of the authors. Further reviews may consider articles that are published in other languages, since researchers can publish studies in languages other

than English. Furthermore, the identification of the included studies was focused on research and review articles. In the future, grey articles can be included as some reports of IPE programs may not be published in journals.

6. Conclusion

This review concludes that IPE assessment involves several factors, namely assessment and competencies. Methods, tools, and assessors make up the assessment part while collaboration, roles, and responsibilities, ethics and values, communication, team and teamwork, and learning experience make up the competencies acquired by the students who join the IPE program. Even though the assessment methods used varies, it is recommended to use more than one method in order to render the assessment more objective. Furthermore, assessors should include teachers or facilitators to give scores. Self-assessment is a preferable method to encourage students to do self-reflection. In addition, students can also observe a role model in clinical practice to enrich their learning experience.

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Author contribution

FYA: Screening and analysis of the articles, manuscript preparation, manuscript revision; DNA: Analysis of the articles, DPD: Analysis of the articles, TNK: Analysis of the articles, manuscript preparation.

Conflict of interest

All authors stated that there is no conflict of interest while conducting and publishing the study.

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Appendix 1.

Table 3. The summary of the reviewed studies

No	Author & Year	Objective	Setting	Design	Assessment Method	Assessment Tools	Participants	Competencies
1	Opina-Tan (2013)	Identifying the students' perception on the implementation of IPE in the Family Case Management	Family	Mix method (quantitative and qualitative)	Self-reflection Focus Group Discussion (FGD)	Family Case Management Questionnaires (FCMQ) Questions for FGD	Students (medicine, nursing, occupational therapy, physical therapy and speech pathology)	(1) Learning about collaboration, (2) Appreciating roles, (3) Realizing holistic care, (4) Providing service to the community, and (5) Realizing a unique learning experience
2	Housley et al. (2018)	Describing the learning outcomes in an interprofessional practice environment	Community	Qualitative method Written reflective statements were analyzed by 3 researchers as coders	Self-reflection	Written reflective statements	Students (medicine, nursing, dentistry, physiotherapy, pharmacy, and dietetics)	Mastering IPE competencies: roles and responsibilities (skill teaching, knowledge sharing, self-discovery, role discovery), ethics and values (communicating with patients, sensitivity to diversity, barriers to health care), interprofessional communication (teamwork building), team and team works (teamwork building)
3	Gallagher et al. (2015)	Exploring participants' response to IPE	Community	Qualitative method	Focus Group Discussion (FGD) and personal interview	Questions for FGD and personal interview	75 students and 12 community providers	Identifying the importance of learning in the work place, identifying the impact of students living with and learning from each other, enabling health as a holistic concept, and identifying the influence of the quality of a positive learning ambiance for students.

Table 3. Continued

No	Author & Year	Objective	Setting	Design	Assessment Method	Assessment Tools	Participants	Competencies
4	Soliman et al. (2012)	Developing, implementing, and assessing an interprofessional rural health professions program for pharmacy and medical students	Rural communities	Quantitative method	Self-administered	Questionnaires for survey	Year 1: 22 students (6 pharmacy and 16 medical) Year 2: 26 students (8 pharmacy and 18 medical)	Realizing collaborative practice in the rural IPE program
5	Haruta et al. (2018)	Developing an interprofessional competency framework for Japanese health care professionals	Community	Qualitative method	Group discussion	Questions for group discussion Prototype to be developed	Health care providers	Mastering two core domains of competencies namely "patient-/client-/family-/community-centered approach" and "Interprofessional communication", and four peripheral domains of "role contribution", "facilitation of relationships", "reflection" and "understanding of others".
6	Haruta et al. (2019)	Exploring the factors associated with self-assessment score of interprofessional collaboration in community hospitals	Community hospital	Cross sectional method	Self-assessment	Assessment of Interprofessional Team Collaboration Scale (AITCS).	325 of 630 students	Understanding the factors affecting IPC namely younger age, mastering nursing profession, building better relationships with neighboring facilities, and realizing greater job satisfaction

Table 3. Continued

No	Author & Year	Objective	Setting	Design	Assessment Method	Assessment Tools	Participants	Competencies
7	Ryan et al. (2015)	Gathering student perceptions about their interprofessional experience	Community	A pre/post intervention design	Students' retrospective assessments	The Students Attitudes Toward Community Service survey	17 of 50 students	Ensuring students can be more comfortable in working with diverse communities and patients as well as in interprofessional teams and incorporating patients' beliefs and personal beliefs into medical care
8	Sullivan et al. (2015)	Developing an IPE opportunity through a community fall prevention event and assessing changes in students' attitudes toward IPE after participation in the event	Community	A pre–post intervention	reflective activity	Readiness for Interprofessional Learning Scale	46 of 63 (73% response rate) (16 pharmacy, 17 physical therapy, 12 nursing, and 18 physician assistants) students	Realizing positive improvement toward greater receptiveness of IPE and interprofessional teamwork
9	Dressel et al. (2017)	Assessing how the students achieve the interprofessional collaborative practice core competencies	Community	A quasi-experimental pre/post-intervention study design	Self-administered	Questionnaires consisting of questions that refer to values/ethics for interprofessional practice, roles/ responsibilities, interprofessional communication, and teams and teamwork	10 participating students	Realizing improvement on values/ethics for interprofessional practice, roles/responsibilities, and teams and teamwork, not only in the interprofessional communication

Table 3. Continued

No	Author & Year	Objective	Setting	Design	Assessment Method	Assessment Tools	Participants	Competencies
10	Randita et al. (2019)	Conducting a pilot study of Interprofessional Education-Community (IPE-COM) for medical and midwifery students	Community	A one-group pre-experimental study with a pre- and post-test	Assessment from supervisor	Intercollaborator Assessment Rubric	15 medical students and 19 midwifery students	Ensuring six IPE competence are measured during the assessment: (1) communication, (2) collaboration, (3) roles and responsibilities, (4) team functioning, (5) collaborative patient-centered approach, and (6) conflict management
11	Findyartinia et al. (2019)	Identifying the perceptions of IPCP implementation and exploring the challenges and barriers associated with socio-cultural values and other factors that could potentially affect the implementation of IPCP	Community	Mix method	Self-administered Group discussion	Collaborative Practice Assessment Tool (CPAT) for quantitative data and Focus Group Discussion for qualitative data	290 of 303 health professionals (61.8% response rate) Nine focus group discussions involving 73 health professionals	Assessing the mastery of competencies namely leadership and vision–mission–aims decision-making and patient-involvement, identifying socio-cultural factors such as uncertainty avoidance tendency, power differentials, and collectivist culture. Themes for FGD: structures, supporting factors, inhibiting factors, perceived benefits, and challenges of IPCP.
12	Walker et al. (2019)	Identifying students' perceptions toward and readiness for	Rural clinical	Mix method Survey for IPE questions	Self-administered	RIPLS, IEPS for survey	60 undergraduate health care students from allied health,	Observing role modelling in the workplace and learning about collaborative practice and the roles of other professions, and identifying

Table 3. Continued

No	Author & Year	Objective	Setting	Design	Assessment Method	Assessment Tools	Participants	Competencies
		interprofessional education in the rural clinical learning environment in one region of Australia			Group discussion	Focused IPE questions for FGD	medicine, nursing and midwifery.	professions, and identifying activities that enhance interprofessional engagement

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ORIGINAL RESEARCH

Barriers and Challenges in Managing Hypertension in Belitung, Indonesia: A Qualitative Study

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Abstract

Background: The Government of Indonesia has provided a Chronic Disease Management Program, better known as PROLANIS, to reduce the incidence of hypertension; however, the prevalence of hypertension remains high in the community, especially in Belitung, Indonesia, which warrants further investigation. One of the strategies to decrease the number of hypertensions is by addressing barriers and challenges in hypertension management according to patients' points of view, which has become a lack of focus in previous studies.
Purpose: This study aimed to explore the barriers and challenges of patients in managing hypertension in Belitung, Indonesia.
Methods: This research employed a qualitative descriptive study design with 20 hypertensive patients who had access to the PROLANIS program in public health centers. Focus group discussions were conducted for data collection. The content analysis was used for data analysis.
Results: Six themes were developed from the data, including (1) Dietary habits: the role of salt, (2) Nonadherence to medication due to the use of traditional medicine, (3) Shopping habit on nonprescription medication, (4) Confusion of anti-hypertensive drugs, (5) Barriers to physical exercise, and (6) Health monitoring and education.
Conclusion: This study serves as an input for nurses and healthcare providers to improve the PROLANIS program, especially in hypertension management, as well as to develop new nursing interventions according to the barriers and challenges.

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1. Introduction

Hypertension is often called a silent killer condition without obvious symptoms in its early stages, which influences the lives of patients (Franklin et al., 2017) and causes comorbidities such as cerebrovascular disease, heart failure, and chronic renal failure (Hakim & Bagheri, 2014; Kurnia et al., 2018). In addition, hypertension also has an effect on psychological aspects, such as anxiety and depression (Shamsi et al., 2017). A review of trends in hypertension shows that 1.13 billion people living with hypertension in 2015 will be increased to more than 1.56 billion in 2025 worldwide (World Health Organization, 2019).

A high prevalence of hypertension and its close relationship with cardiovascular diseases has become one of the most critical challenges globally, especially in developing countries, such as India, South Africa, Brazil, and Indonesia (Ibrahim & Damasceno, 2012; Shi et al., 2016). The burden of cardiovascular disease in Indonesia is significant, in which stroke and coronary heart diseases account for more than a third (0.5 million) of all deaths annually, with hypertension being one of the leading causes of mortality (Ministry of Health Republic of Indonesia, 2013; WHO & UN Partners, 2015).

From the total of 34 provinces in Indonesia, based on Basic Health Research or a community-based national scale research implemented by the Agency of Health Research and Development, Ministry of Health Republic of Indonesia, Bangka Belitung province has the highest prevalence of hypertension than the other provinces, in terms of the absolute number of people, with a total of 1,380,762 (30.9%) (Ministry of Health Republic of Indonesia, 2013, 2018).

One of the efforts conducted by the Government of Indonesia in reducing hypertension is by providing a Chronic Disease Management Program, better known as PROLANIS (or *Program Pengelolaan Penyakit Kronis*). It was started in 2010 by the Health Insurance Company (or called ASKES, national social insurance covering government employees and military of nearly 20% of the population of Indonesia) as a proactive approach in reducing chronic diseases, especially diabetes mellitus (DM) type 2 and hypertension (Soewondo et al., 2013). The program is designed to improve quality of life and empower beneficiaries to manage chronic health problems, especially hypertension, diabetes mellitus, cardiovascular diseases, and chronic renal disease. The PROLANIS is continued by the National Social Insurance Administration Organization (or called BPJS) and spearheaded by primary care physicians (BPJS Health, 2014).

There are five activities of PROLANIS mainly conducted in public health centers or called *Puskesmas*, namely: 1) Consultation of PROLANIS participants: a scheduled consultation mutually agreed between participants and health care providers, 2) Education of PROLANIS participant groups to increase health knowledge in an effort for the treatment and prevention of recurrences of the disease as well to improve the health status of participants, 3) Reminder via Short Message Service (SMS) gateway to motivate participants to do regular visits to health care providers through a schedule reminder consultation, 4) Home visit, a service activity visits to PROLANIS participants' homes for the provision of information, self-health education and environment, and 5) PROLANIS gymnastics, an effort to improve health maintenance and increase physical activity through sport or gymnastics activities conducted with a frequency of once per week (BPJS Health, 2014). However, the PROLANIS activities are expected to effectively reduce the number of patients with hypertension and diabetes mellitus.

Most of the PROLANIS activities are conducted in public health centers. Our literature review with a date range between 2017 and 2021 indicated that numerous studies discussed PROLANIS and hypertension in Indonesia. The local studies have revealed that the PROLANIS program had a significant effect on lowering hypertension, as the study results of pre-experimental studies (Arsyad, 2017; Ningsih, 2017; Sidiq, 2019; Syamson et al., 2020; Herwati & Delima, 2021; Rani & Farhan, 2021), quasi-experiments (Armawati & Eha, 2018; Fahlevi et al., 2019), and a case-control study (Dyanneza & Tamtomo, 2017). But, although the impacts of PROLANIS sound promising, hypertension remains the problem in the community. To the best of our knowledge, in terms of a quantitative strand, none of the recent studies have employed a true-experimental design in examining the effect of PROLANIS on hypertension. Instead, most of the studies used a pre-experimental method in limited settings that might not be sufficient to conclude the findings. Also, most existing studies mainly focused on specific PROLANIS activity, especially PROLANIS exercise or gymnastics on hypertension (Lumempouw et al., 2016; Armawati & Eha, 2018; Sidiq, 2019) rather than the PROLANIS program as a whole.

In addition, local studies using a qualitative design have been identified in the literature, which aimed to evaluate the PROLANIS implementation in the healthcare centers. The results have revealed that the PROLANIS programs were not yet optimal. Several issues were found, which can be grouped into lack of funding for PROLANIS activities (Manalu, 2017; Firdaus, 2018; Silitonga, 2020; Wardani, 2020; Rachmawati, 2021; Syafitri, 2021), no standard procedures for PROLANIS implementation (Manalu, 2017; Firdaus, 2018; Silitonga, 2020; Wardani, 2020; Isnadia et al., 2021; Rachmawati, 2021), lack of staff (Silitonga, 2020; Wardani, 2020; Syafitri, 2021), lack of socialization (Rachmawati, 2021), inconsistent schedule for the activities (Syafitri, 2021), poor facilitation (Silitonga, 2020; Rachmawati, 2021), unclear job description among staff (Ilahi, 2019; Silitonga, 2020), bureaucracy (Ilahi, 2019; Silitonga, 2020), communication (Ilahi, 2019; Silitonga, 2020), low participations and adherence from the participants (Manalu, 2017). These are significant issues that need to be solved for the successful implementation of the PROLANIS program.

However, the existing qualitative studies mentioned above most likely focused on PROLANIS management rather than hypertension management, although it is closely related. In addition, the findings were mostly according to healthcare staff perceptions rather than the patients' perspectives in addressing their barriers and challenges in managing hypertension. As a matter of fact, understanding the patients' views is a necessity to see a different angle point of the problems, which may also be related to their cultural contexts/issues. In addition, to our knowledge, none of the studies have been conducted in Belitung, Indonesia, on the barriers and challenges in hypertension management among patients, which limit the presentation of other

cultural and managerial problems in Indonesia. Therefore, this study aimed to explore the barriers and challenges in managing hypertension among patients who had access to the PROLANIS program in public health centers in Indonesia. The findings of our study are expected to be an input for the PROLANIS program, particularly for developing an effective nurse intervention in order to decrease the prevalence of hypertension, as well as for a basis for an experimental study that should fit with the patients' context.

2. Methods

2.1 Research design

This study used a qualitative descriptive design phenomenological outlined by Lambert and Lambert (2012) to explore the barriers and challenges in managing hypertension in patients who had access to the PROLANIS program in Indonesia. To report the results of this study, the Consolidated criteria for Reporting Qualitative Research (COREQ) checklist (Tong et al., 2007) was used.

2.2 Setting and participants

Public health centers were selected as the primary sources of revenue for local governments of Indonesia and are considered agents for carrying community health programs (Hull, 2015). There are nine public health centers in Belitung region, and three public health centers were selected in this study, which were located in different settings, both in the central city of Belitung and rural area of Belitung. This study was conducted in April 2018. Twenty patients were selected using a purposive sampling method. The inclusion criteria of the respondents were adult patients with hypertension, having access to the PROLANIS program, and having uncontrolled or poorly managed hypertension. The uncontrolled or poorly managed hypertension is determined when blood pressure starts from 140 (systole) and/or 90 mmHg and more (diastole). According to Wang and Vasan (2005), a criterion for control is defined as blood pressure <140/90 mm Hg at >75% of visits.

2.3 Data collection

Data were collected using Focus Group Discussions (FGDs) among patients with hypertension in April 2018. Prior to data collection, the researchers sent a letter to each public health center to inform the objective and procedure of the study after being given study approval. Once the directors of public health centers had permitted collecting data, the researchers were asked to contact the in-charge nurses responsible for the hypertension program. The nurses then checked the schedule, availability, and willingness of each patient and made an appointment for FGDs.

FGDs among patients were used to provide an interactive setting with open and enjoyable discussion to gather the patients' opinions, experiences, and beliefs related to hypertension. Another reason was that most patients felt shy (prior to data collection) talking with the investigators through a private and direct interview, and they preferred to discuss their perspectives among their friends (other patients), so they could freely express their thoughts and experiences.

FGDs were done three times in three different groups in different public health centers, with 20 patients. The first group consisted of seven persons, the second group comprised seven persons, and the third group consisted of six persons. The FGD ranged from 50 to 100 minutes. The FGDs were conducted after each participant signed informed consent. There was no one refused to participate in this study.

Bahasa Indonesia or Belitung language was used during the FGDs. Two researchers conducted FGDs, namely, J.G and N.N. During FGDS, N.N also acted as an interpreter for the other researchers for clarity and further discussions. The informants in this study were initially asked an open-ended question. All questions in Table 1 were just examples; more questions were asked following the answers from the respondents and continued until the data reached saturation, especially when the researchers heard the same comments repeatedly.

The FGDS were audio-recorded, transcribed verbatim, and validated by re-listening to the recording by researchers. In addition, all researchers analyzed, reviewed, and discussed each interview and transcript collaboratively. The participants were coded from P1 to P20.

Table 1. Question guidelines

Questions to ask patients
• Please tell me how you manage your hypertension? • What kind of strategies do you use at home to manage your symptoms? • Do you have a diet program to control hypertension and DM? • How do you manage your food with your family? • What kind of food do you like? • Do you join the exercise program at the public health center? Are you also doing exercises at home? • Do nurses explain about your diet and program to decrease your blood pressure? Do you follow them? If not, why? • What are the barriers and challenges to managing your diet, exercise, and lifestyle? • Do you take medicine following the order of health practitioners? • When the drugs run out, do you come to public health centers again to control or just buy the pills yourself? • How often do you control your blood pressure? How and where?

2.4 Data analysis

The data were analyzed using a content analysis approach outlined by Vaismoradi et al. (2013), which consists of transcribing each interview, reading the transcripts repeatedly to get to the themes by highlighting the codes in the significant excerpts to grasp the meaning units, and organizing the meaning units under subthemes and themes (Vaismoradi et al., 2013). All textual data, including themes or findings, were translated from the Indonesian language into English in the text for data analysis. It was necessary because the other researchers (Y.A., R.P., S.A., and S.P) are non-Indonesians. The translation decisions were guided by the framework of Abfalter et al. (2020), which the translation was done in all stages of the research.

2.5 Trustworthiness

Internal member checking (in the form of thematic results, not a full report) was done after the FGDs by the principal investigators to ensure trustworthiness. Member checking is considered the most critical technique to establish the credibility of a qualitative study (Gunawan, 2015). Comparing and contrasting the findings with experienced researchers were also done to prevent personal bias and ensure the quality of data. It is also noted all methodological issues and decisions were documented. This audit trail was made for almost four weeks.

2.6 Ethical considerations

The study approval was obtained from the Local Research Ethics Committee of the Department of Health of Tanjung Pandan, Belitung, Indonesia (reference number: 440/1325/ DINKES). The study permission was also obtained from the Public Health Centers where the study took place. All participants were informed of and signed written informed consent for their participation in this study. They were informed about the objective of the research, and their participation was voluntary. All data remained confidential and would be published anonymously.

3. Results

3.1 Characteristics of participants

The majority of the participants in this study were females, with an average age of 56.6 years. Most of them had a low educational background, and all were married. Fifty percent of the participants had hypertension for five to ten years, with an average of 6.33 years. Forty-five percent had comorbidities such as heart disease, diabetes mellitus, and stroke (Table 2).

Table 1. Characteristics of patients with hypertension (n=20)

Characteristics	Mean±SD	f	%
Gender			
Male		1	5
Female		19	95
Age (year)	56.6±10.29		
Education			
Elementary school		10	50
Junior high school		3	15
Senior high school		7	35
Marital status			
Married		20	100
Single		0	0
Duration of hypertension	6.33±2.95		
<5 years		8	40
5-10 years		11	50
>10 years		1	5
Other diseases			
No		11	55
Yes (Heart disease, diabetes mellitus, stroke)		9	45

3.2 Analytical findings

There were six themes developed from the data, including (1) Dietary habits: the role of salt, (2) Nonadherence to medication due to the use of traditional medicine, (3) Shopping habit on nonprescription medication, (4) Confusion of antihypertensive drugs, (5) Barriers to physical exercise, and (6) Health monitoring and education. The themes represent new challenges and barriers in hypertension management according to the patients' perspectives. Those themes are described with exemplars from the participants' quotes.

3.2.1 Theme 1: Dietary habit: The role of salt

The majority of the patients knew that controlling diet, such as not eating salty, fatty, and unhealthy food, was very important, but it was hard for them to follow. This has become a dietary habit among the patients in this study. They prefer not to follow the restrictive diet, making them uncomfortable. Unhealthy foods are described as foods with less nutritional value and high in fat, sugar, and calories, mostly included in snacks, fats, "fast" foods, cream-based sauces, and others.

The participants expressed their dietary habits in the following statements: *If I eat an instant noodle, I just add salt inside it. If not salty, it does not taste good. I know it is dangerous, but I love it* (p1, FGD 1), AND *I still cannot control my food; although I know I cannot eat salty and fatty foods, I still eat them, but not every day* (B6, FGD 3).

Most of the participants were able to cook and prepare their meals. Still, no one was able to avoid salt in their food. The participants said: *It is difficult to manage hypertension, especially to handle not eating salty food although we cook by ourselves. It is not delicious without salt* (p2, p3, FGD 2).

3.2.2 Theme 2: Nonadherence to medication due to the use of traditional medicine

The participants mostly used traditional medicine to manage hypertension, either combined with or replacing prescribed medications. For example, the participant expressed that she used traditional leaves mixed with water for a daily drink: *I eat "Daun Suji" (Dracaena Angustifolia leave) when my blood pressure is high. Seven leaves are pounded, mixed with water, and drink two times per day for three days. It is how Sensei from Chinese medicine told me* (p1, FGD 1). And, she also said: *I use this traditional medicine in combination with the medication given by the public health center* (p1, FGD 1).

The other participant used traditional medicine by combining fruits, leaves, and beans for the treatment. She said: *cucumber, star fruit, three celery, three yardlong beans, and eat them*

together at night for hypertension (p5, FGD 1). She also expressed: *I do not drink the prescribed drugs if I use this medicine. Yeah, I cannot mix them* (p5, FGD 1).

3.2.3 Theme 3: Shopping habit on nonprescription medication

Some patients had a shopping habit of using nonprescription drugs other than those prescribed by medical doctors in public health centers. This indicates self-medication, in which they bought the drugs directly in the pharmacy following the previous prescription of the physicians with the exact dosage without any assessments. A participant expressed this: *I have an available antihypertensive drug (captopril) at my home; I bought it myself from a pharmacy. I showed the drug to the pharmacist, and he gave me those* (p2, FGD 1).

Besides, another participant preferred to buy a drug in public shops instead of the kind of drugs given by physicians: *If I feel headache, I eat Bodrex (name of the antihypertensive drug in public shops, e.g., Alphamart)* (p2, FGD 1).

This self-medication habit is made through generations of the people in Belitung. It is difficult to find those who directly go to public health centers or hospitals without having self-treatment at first. Besides, it is also closely related to the following theme (confusion of antihypertensive drugs) and barriers, such as access to the health centers.

3.2.4 Theme 4: Confusion of antihypertensive drugs

Additionally, there was confusion among the patients in taking antihypertensive drugs. Some patients only took the drugs when they knew their blood pressure was elevated, while the others took the medication every day. This confusion is expressed in the following statements: *I will have an antihypertensive drug if my blood pressure is high only. If it is not high, I will stop having it* (p1, FGD 1); *I always consume antihypertensive drugs every time without knowing the symptoms. I just have it* (p2, FGD 1); AND *which one is true? Taking medicine if high blood pressure or every day without considering how high your blood pressure is?* (P1, FGD 1).

Interestingly, this confusion is related to different treatments among public health centers for patients with hypertension, as indicated in this study. One public health center gave antihypertensive medications for three days and asked the patients to return to the center for evaluation. In another public center, the antihypertensive drugs were provided for one month, and there was no drug given to the patients if the blood pressure was not elevated (for those who had hypertension at a previous visit). The participants said: *We have antihypertensive drugs from the health center for one week and sometimes one month* (B2, FGD 3); *when I had myself checked for hypertension, I got antihypertensive drugs for one month in this public health center* (A3, FGD 2); AND *in this health center if my blood pressure was not high, the drug was not given* (p1, FGD 1).

3.2.5 Theme 5: Barriers to physical exercise

Although most patients were happy joining the PROLANIS program and were aware that exercise is essential for their health, some could not attend. Several barriers were identified: First, difficult access to the public health center, which is expressed by the participant. *I want to go to exercise, but I don't have a motorbike, and no one sent me* (B2, FGD 3).

Second, unsuitable exercise for the elderly. This is expressed in the following statement: *I am too old to exercise, and the exercise that is conducted every Friday is for young people only* (A4, FGD 2); *I rarely join the exercise in this public health center, just walking in the morning, but not routine* (A2, FGD 2).

Third, it is related to the participants' motivation. Not all individuals like to do exercise, and some might feel lazy and need some supports. The participant expresses this: *I am a bit lazy and bored to exercise. But nurses always call me to join the exercise* (B1, FGD 3).

3.2.6 Theme 6: Health monitoring and education

There was a lack of health monitoring and education for hypertension in public health centers. From the three public health centers in this study, only one public health center has done the health monitoring and education for hypertension in the community. They work closely with elderly integrated health posts or *Posbindu lansia*.

Regarding health monitoring, the participants expected that the nurses would regularly come to their homes to check their conditions. Participants expressed this: *Sometimes, there is a nurse*

who comes to my home to check my blood pressure (pick-up program) (P3, FGD 1); *Today, no one from the health center comes to our home* (P4, FGD 2). *I think it is good if a nurse comes to our house to control* (A3, FGD 2); *we expect nurses to visit us and check our health routinely* (B2, FGD 3).

The participants also expected that health education could be conducted regularly. Only one public health center provided health education, but it was only performed once per month, while the other public health centers did not offer any. This is expressed by the participants. *I do not think there is a problem in the health center, we do exercise and check for their hypertension, but there is no health education and seminar* (p3, FGD 1); AND *lack of health education in this health center, only one time per month* (p3, p4 FGD 1).

4. Discussion

This study explored the barriers and challenges of managing hypertension among patients who had access to PROLANIS in Belitung, Indonesia. Six themes were developed from the data analyzed based on the qualitative descriptive approach. The themes include dietary habits: the role of salt, nonadherence to medication due to traditional medicine use, shopping habit on nonprescription medication, the confusion of antihypertensive drugs, physical exercise barriers, and health monitoring and education.

The theme "dietary habit: the role of salt" reflects that the patients with hypertension in Belitung, Indonesia, did not adhere to the restrictive diet although they had knowledge about hypertension and were aware of the impact of an unhealthy diet on their condition. The restrictive diets can place individuals outside of a culture for which salty foods are commonplace. In fact, Belitung, the setting of this study, has a unique and popular culinary food called *gangan* (yellow fish soup with pineapples) and *taoge ikan asin* (stir-fried bean sprouts with salted fish) (Aprionis, 2020), which are typically consumed by the participants in this study. In addition, food that is normal and familiar can be a much easier choice and a much more comfortable way of being in the world and fitting in, despite the risks. Having hypertension focuses on salty food, changing the meaning of experiences related to food/eating. This is similar to another part of Indonesia, at Minangkabau Payakumbuh, where people like to eat salty and high-fat food; thus, it serves as a barrier to managing hypertension (Kurnia et al., 2018). Also, in a study in Bangladesh, the patients with hypertension were aware that they should restrict salt intake, but most failed to practice it (Jahan et al., 2020).

Additionally, this finding was in line with a previous study that implied that adherence might not be affected by knowledge (Jolles et al., 2013), or perhaps, it is just to a limited extent of behavioral change (Mooney & Franks, 2011). Besides, the PROLANIS program provided by the Government of Indonesia does not provide the diet program, as mentioned in the background. The program only focuses on exercise, which might limit the effectiveness of prevention and controlling hypertension. Therefore, according to the study findings, it is recommended for the public health centers to provide a diet program, which may be related to healthy food consumption, nutrition, and healthy cooking. It is noteworthy that the diet program must be planned and monitored, not only limited to the diet education and eating plan. This is an additional suggestion for the studies that just recommended diet education according to DASH (Dietary Approach to Stop Hypertension) eating plan (Dyanneza & Tamtomo, 2017; Herwati & Delima, 2021).

The second theme "nonadherence to medication due to the use of traditional medicine" indicates the poor medication adherence or compliance of the community, either they combine with or replace the prescribed medicines, which reflects another barrier in managing hypertension. It is similar to a previous study, which revealed that nonadherence to medication because of the use of traditional medicine is one of the barriers in hypertension management (Gebrezgi et al., 2017). It is undeniable that people in Indonesia not only believe in conventional medicine (Ritonga et al., 2017) but also in shaman for the medication (Sherliawati, 2014). It is in line with a study in rural Yogyakarta, Indonesia, which also found that the patients with hypertension tend to have the preference to manage hypertension on their own, especially to use traditional or alternative medicines and herbs, such as cucumber, avocado leaves (Rahmawati & Bajorek, 2018), aloe vera (Yuliawati et al., 2021), celery leaves (Isnainy et al., 2021), cupping therapy (Darmawan et al., 2017), acupuncture (Hidayah et al., 2021), and others to replace the prescribed medication. Therefore, during the assessment of patients with hypertension, nurses

need to ask whether the patients use traditional medicine or combine it with the prescribed drugs before visiting public health centers to improve shared understanding and decision-making.

The third theme is related to the shopping habits on nonprescription drugs, which is common among people in Belitung, Indonesia. They most likely follow a previous dosage of the antihypertensive medications without further evaluation. This shopping habit is not only for the treatment of hypertension but also for all treatments of diseases. The community prefers to try self-treatment first or follow the medication from their friends or family members' experience before directly going to the public health centers. Another reason to do this is most likely related to the next theme (confusion of antihypertensive medicine). However, this will lead to ineffective medication, adverse events, and, in some cases, death. In addition, nonprescription drugs can be misused or abused and can be intentional or unintentional. From these patients' perspectives, health practitioners in public health centers, especially pharmacists, are in an ideal position to help deter misuse and abuse (Ferreri, 2016).

The theme "confusion of antihypertensive drugs" reflects the lack of understanding about the "chronicity" of hypertension and lack of communication about medications between health care providers and patients. The majority of patients were confused about how to take hypertensive medicines. Some of the patients took pills regularly, and some took them only when the symptoms occurred. This is in line with findings from a previous study that, at the same time, every day the patients did not take medication (Cazorla & Rodríguez, 2013), and most of these patients had stopped taking the medication without consulting their doctor when the blood pressure was in the normal range or when the symptoms of hypertension were reduced (Marshall et al., 2012; Shamsi et al., 2017). It is suggested that nurses need to give the information that medication adherence is the key success of hypertension management, and they need to point out that symptoms are not a key indicator of high blood pressure (Kronish et al., 2012). In addition, the confusion of patients is related to the meaning of "normal" blood pressure, which may be defined as "cured" and cause patients to modify or stop medication (Kronish et al., 2012). Therefore, the use of "controlled" should be more accurate for patients with chronic illnesses like hypertension (Kronish et al., 2012). In addition, this confusion is closely related to the different treatments among public health centers, which has become a new topic or unique findings among patients in treating hypertension. The health practitioners need to emphasize that the medication for hypertension is seen on an individual basis, different from one patient to another, considering comorbid conditions in each patient (Passarella et al., 2018). However, based on the patients' perspectives, there is a need for the health practitioners to discuss with each other to address this issue to avoid misunderstanding and mistreatment of their patients.

The theme "barriers to physical exercise" indicates a need for public health centers to reconsider and remake the exercise program to be "fit" and attractive to all generations. As the patients in this study indicated, the exercise program might not be suitable for the elderly. In addition, nurses need to assess the low and high risks of patients doing physical activity. However, physical exercise can reduce their blood pressure (Diaz & Shimbo, 2013). In addition, access to public health centers should be considered, especially for the elderly who cannot go to the public health centers on their own. Therefore, the public health centers may need to provide a "pick-up" program to encourage and motivate the patients to join the program. Also, nurses need to provide education to family members to support the patients considering their physical disabilities. Lagu et al. (2015) said that patients with disabilities have physical barriers to access health care. However, family support plays a pivotal role in access to care, exercise, diet, and medication (Shima et al., 2014).

The last theme was developed based on the patients' expectations on health monitoring and education. Only one public health center has a monitoring system for detecting patients with hypertension. In contrast, other two public health centers only have the monitoring system inside the public health center based on those who come to the public centers directly, which might be due to a lack of human resources. In this situation, the public health centers need to set another strategy, such as utilizing cadres from the elderly-integrated health service post or *Posbindu lansia* to do screening or health visits under the supervision of nurses. Cadre is the village volunteer selected from community members (Nazri et al., 2016). However, training for cadres is needed because health visits require effective communication between patients and health professionals to build trust and increase the knowledge and understanding of patients regarding their conditions and medication regimen (Nazri et al., 2016).

Besides, the lack of health education was seen from the number of the health education program only provided once per month, which might not be enough to increase the knowledge of patients regarding the disease and its treatment, side effects, and lifestyle behavior. Another strategy for health education should be made, such as health education while the patients are waiting for their treatment. It is unarguable that long waiting is one barrier for the patients to come to the public health centers. The long queue would not be wasting their time with attractive health education but instead giving more knowledge about their disease and treatment. However, it does not mean that long waiting is good for patients; redesigning the queue system is also needed to reduce waiting time.

5. Implications and limitations

The findings of this study provide new insight for the management of hypertension for nurses and other healthcare workers and the new inputs for PROLANIS in Indonesia from the patients' perspectives: 1) the study results indicated that the PROLANIS, as well as hypertension management programs worldwide, need to mainly provide and focus on diet practice, diet management, and control. It is known that many patients failed to follow the diet recommendations; 2) from the study findings, it is also suggested for nurses and other healthcare professionals to conduct a patient's assessment regarding the use of traditional medicine in the self-treatment of hypertension. It is necessary because many patients still use, combine, and believe in conventional medicine, which may influence the treatment or nonadherence to the medication. In addition, developing an assessment that focuses explicitly on traditional medicine is needed if the form does not exist; 3) nurses and other healthcare practitioners need to pay attention to the shopping habits of the patients on nonprescription drugs. This is the homework for all health professionals to increase patient awareness to avoid drug misuse and abuse. Besides, the findings of this study also indicated that a discussion among health practitioners is needed to deal with the patients' confusion regarding the treatment. It needs to emphasize that the treatment is done on an individual basis; one medicine or treatment cannot fit all; 4) every healthcare center is demanded to provide an attractive exercise program that includes all generations. It can be one for all, or each population group has its own exercise program. The elderly may not be able to do an aerobic exercise, cardio workout, or fat burning program. This has to be a program for an elderly group; 5) it is recommended for healthcare centers to provide a pick-up service for those who do not have easy access. Sometimes we cannot wait for the patients to come to the centers; we need to see them directly or pick them up to join the healthy program and check-up health. However, human resource strategy needs to be well managed. Utilizing cadres is recommended; 6) health education should be regularly conducted because knowledge changes over time. Updated knowledge and information need to be disseminated to avoid hoaxes and misinformation.

This study has limitations. The findings of this study might not represent the whole Indonesian context because another part of the country may provide other cultural and managerial contexts, which may influence hypertension management. However, it is noteworthy that culture cannot be separated from the treatment. In addition, patients' perspectives might not provide a holistic understanding of PROLANIS management, but their views remain essential as they are the recipients of the healthcare services.

6. Conclusion

As hypertension has become a significant public health problem, understanding the patients' perspectives is necessary to provide comprehensive hypertension management. Our findings underscore the barriers and challenges in managing hypertension in one of Indonesia's health care system contexts. Differences and similarities from the patients' views were analyzed and resulted in six themes – dietary habit, use of traditional medicine, shopping habit on nonprescription medication, the confusion of antihypertensive drugs, barriers to physical exercise, and health screening, which should be addressed and solved by healthcare providers, especially healthcare practitioners including community nurses in public health centers in Indonesia and beyond. However, future studies need to address various settings to understand holistically the management of hypertension considering multi-cultures in Indonesia. In addition, an interventional study is also necessary to determine the effect of the combination of diet, exercise, and medication programs on hypertension.

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Author's contribution

All authors contributed to substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data. JG and NN contributed to data coders. All authors are also involved in drafting the manuscript or revising it critically for important intellectual content and given final approval of the version to be published. Each author has participated sufficiently in work to take public responsibility for appropriate portions of the content and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of interest

The authors declared that there is no conflict of interest in this study.

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ORIGINAL RESEARCH

Workplace Assertiveness of Filipino Hospital Staff Nurses: A Cross-sectional Study

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Abstract

Background: Several studies have demonstrated the significance of assertiveness in the nursing profession. However, there is a lacuna in the literature regarding the level of workplace assertiveness of Filipino nurses.
Purpose: This study determined the workplace assertiveness towards nursing colleagues, nursing management personnel, medical doctors, and other members of the health team among hospital staff nurses.
Methods: The data in this cross-sectional study were collected from randomly selected staff nurses (n=223) involving two tertiary hospitals in the Philippines using the Workplace Assertive Behavior Questionnaire. Descriptive statistics and tests for differences were used to analyze the data.
Results: Results showed that staff nurses had moderate workplace assertiveness. They were less assertive towards the nursing management personnel, and were less likely to provide constructive criticisms and say no to requests. Assertiveness significantly varied based on employment status (p=.001), age (p=.046), years of nursing work experience (p=.037), and years in the present organization (p=.022). A sense of responsibility to patients was the main facilitator while reprimand and fear of repercussions from the nursing management personnel were the major barriers to assertive behaviors.
Conclusion: Personal and work environmental factors can inhibit or support assertiveness. This study highlighted some gaps in Filipino staff nurses' assertiveness at work. Nursing management plays a pivotal role in nurses' assertiveness. Efforts should be made to address the barriers and improve the assertiveness of staff nurses.

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1. Introduction

Assertiveness or the ability to freely express feelings, thoughts, beliefs, and opinions that do not violate the rights of others is a desirable trait or skill nurses need to develop and possess in the workplace (Alberti & Emmons, 2008; Oducado, 2021a, 2021b). Assertive individuals are able to present suggestions directly and comfortably, respond and express their positive and negative feelings without undue anxiety and anger, give and take criticisms, and stand up, speak out, and act in their own best interest (Amicone & Miller, 2015; Larijani et al., 2017; Ames et al., 2017). As a learned communication skill or behavior (Timmins & McCabe, 2015), communicating assertively has been acknowledged as instrumental to ensuring patient safety and preventing adverse incidents in health care settings (Amicone & Miller, 2015; Omura et al., 2019). Moreover, the nursing profession cannot achieve full autonomy, empowerment, and good professional standing when nurses are not assertive (Arslan et al., 2013; Timmins & McCabe, 2015).

Acquiring knowledge on the effective use of assertive behavior and becoming more assertive in the workplace are important for professional nurses to effectively establish good teamwork, manage complex human situations, deal with the challenges in their workplace, and aid in the development of confidence (Ilyas et al., 2018; Mansour et al., 2020). Thus, assertive communication is considered an effective form of communication, a middle ground between passive and aggressive types of communication (Ames et al., 2017; Bulut et al., 2018). However, behaving assertively can be challenging for nurses (Okuyama et al., 2014).

Meanwhile, there are already studies conducted on assertiveness among nurses and nursing students in other countries like South Africa (Rasetsoke, 2012), Eqypt (Ibrahim, 2011), Iran (Hadavi & Nejad, 2018; Hamooleh et al. 2018; Larijani et al., 2017), Pakistan (Ilyas et al., 2018), Turkey (Bulut et al., 2018), and India (Kaur et al., 2018; Sabatina et al., 2018; Sreedevi et al.,

2018). Prior researchers commonly used the Rathus Assertiveness Schedule (Ibrahim, 2011; Sreedevi et al., 2018; Kaur et al., 2018; Sabatina et al., 2018; Bulut et al., 2018) to assess the level of assertiveness. Moreover, there are also review studies conducted on assertiveness (Lyndon, 2006; Okuyama et al., 2014; Lee et al., 2021). Interestingly, the earlier work of Lyndon (2006) disclosed that the findings regarding nurses' assertiveness were mixed. The literature review of Okuyama et al. (2014) found that nurses still experience some difficulties asserting themselves. In addition, most of the studies reviewed by Okuyama et al. (2014) came from the United States of America, and the remaining originated from countries like Japan, Australia, Canada, and Ireland. A more recent systematic review of Lee et al. (2021) about factors influencing the speaking up behavior of nurses included studies conducted in Taiwan, South Korea, Japan, and Hong Kong. It has been argued that nurses' assertiveness in other countries with different cultural backgrounds can work differently (Okuyama et al., 2014). Maheshwari and Gill (2015) recommended investigating the socio-cultural circumstances or factors that may enhance or prevent assertiveness.

Moreover, prior studies have shown a number of determinants of nurses' assertiveness. For instance, Maheshwari and Gill (2015) found that age, nature of job, type of school in basic nursing education, type of hospital where nurses are working, and self-esteem affect nurses' assertiveness. Abed et al., (2015) noted that age, experience, and self-esteem are linked with assertiveness while Abdel-Aleem et al., (2009) disclosed that leadership style and job satisfaction positively influence nurses' assertiveness. The study of Oducado (2021a) reported that empowering behavior of leaders, psychological empowerment, and self-esteem were variables associated with assertiveness of staff nurses. Furthermore, Binuja and Nagarajaiah (2020) described intrinsic (e.g., gender, personality, knowledge, skill, confidence) and extrinsic (e.g., culture, religion, peer groups) factors influencing assertiveness in nursing.

Despite the significance of assertiveness, to the best of our knowledge, there is minimal evidence on nurses' assertiveness in the workplace in the Philippines. Also, there is not much attention in the literature exploring nurses' assertiveness from a generally collectivist society (Chan & Rowe, 2014). Whereas the Western culture tends to be individualistic and value assertiveness (Ma & Jaeger, 2010), the Philippines tends to be a collective-oriented society (Broomhall & Phillips, 2020). As local traditions and values provide a framework on how people behave and communicate, some Filipino values may not be supportive of assertiveness (Oducado, 2021a; Ordonez & Gandeza, 2004). Hence, a better understanding of assertiveness among Filipino nurses is deemed necessary so that measures can be done to improve assertive behaviors. This research was conducted to examine Filipino staff nurses' level of assertiveness towards their nursing colleagues, the nursing management personnel, medical doctors, and other members of the hospital team. This study also determined significant variations in staff nurses' assertiveness levels classified according to personal and work-related characteristics. In addition, staff nurses' reasons, facilitators, and barriers to workplace assertiveness were also investigated.

2. Methods

2.1 Research design

A cross-sectional research design was employed in this study. Data collection was done at one point in time giving a snapshot picture (Sapar & Oducado, 2021) of the assertiveness level of Filipino staff nurses.

2.2 Setting and samples

The participants of this study were Filipino staff nurses. The sample size was computed using the formula $n = N/(1+Ne^2)$. The sample size computation resulted in a minimum required sample size of 201. However, 230 questionnaires were distributed and proportionally allocated in one public and one private tertiary hospital in the Philippines. More than the required sample size was included to increase the diversity of nurses per hospital unit and to address refusal and nonresponse rates. A total of 223 staff nurses randomly selected through lottery technique participated in the study. The response rate was 97%. Only staff nurses in the two selected tertiary hospitals were included, while nurses who were 65 years old and above, and with supervisory positions, volunteers, and trainees, were not included in the study. Tertiary hospitals were selected because they are bigger and had more number of nurses. Moreover, only two tertiary

hospitals were chosen since the number of nurses in these hospitals were already adequate based on the priori power analysis.

2.3 Measurement and data collection

The Workplace Assertive Behavior Questionnaire by Timmins and McCabe (2005a, 2005b) was adopted in this study. Eight items assessing eight assertive behaviors were presented to assess workplace assertiveness. Nurses were asked to respond on a Likert scale (1 = never to 5 = always) how often they use these behaviors towards their nursing colleagues, the nursing management, and the medical personnel. Sample items include "I express my disagreement with my nursing colleague's opinions where appropriate.", "I provide constructive criticism to nursing management personnel.", "I say no assertively to medical colleagues requests where appropriate." Higher scores indicate higher assertiveness level. For this study, the 5-point scale was equally divided into three categories and the following arbitrary mean scale to interpret the results was used: High = 3.67-5.00, Moderate = 2.33-3.66, Low = 1.00-2.33. The cultural appropriateness of the instrument was examined by a panel of seven local experts in nursing using the survey instrument validation rating scale (Oducado, 2020). Pilot testing with 30 staff nurses in another hospital revealed a reliability of $\alpha = 0.95$ (Oducado, 2021a). The participants were also asked how assertive they are towards other healthcare team members: nursing attendants or nursing aides, institutional workers or orderly, midwives, physical or occupational therapists, dieticians or nutritionists, medical technologists, pharmacists, administrative staff (e.g., office clerks), and chaplain or priest. Response options for this section of the questionnaire was in the form of Likert scale (1 = never to 5 = always). A multiple response question to allow numerous answer alternatives and let the participants select more than just one option was used to inquire staff nurses about their reasons (11 items), facilitators (15 items), and barriers (24 items) towards behaving assertively in the workplace. Participants were also made to specify other options they deemed applicable. Staff nurses' personal and work-related characteristics were also collected which include age, sex, highest educational attainment, type of school graduated, employment status, type of hospital, years of nursing work experience, years in the present organization, present unit of assignment, and if they had pre-service education or training and in-service attendance to seminars and training on assertiveness.

The self-completion pen-and-paper questionnaire was administered in 2019 between the months of June to July. The researchers obtained ethical and administrative clearances prior to data gathering. Proper coordination with the Nursing Service Office was made in the distribution of the survey questionnaires. The questionnaires that were placed inside sealed long brown envelopes were distributed by one of the researchers and two trained data gatherers to the participants who were assigned in the different units of the hospitals either before or after their shift or during their break time. The staff nurses were asked if they would be willing to participate in the study and informed consent was obtained. The participants were oriented with the purpose of the study, the benefits that they could get from participating, risks involved, and questions were entertained thereafter. The participants were allowed to answer the questionnaire at their preferred time and place. The survey forms were retrieved after sufficient time was given to the participants to fill-out the questionnaire. The completeness of the data entry was checked before each participant submitted the accomplished questionnaire. The data collected were coded and entered into the Microsoft Excel and the Statistical Package for Social Sciences (SPSS) version 23.

2.4 Data analysis

The data were described using frequency (f), percentage (%), mean (M), and standard deviation (SD). The t-test and ANOVA with Scheffe post hoc test assessed differences in assertiveness between categories after normality of data distribution was determined. Test of normality revealed that data does not deviate from normal distribution. The alpha level of significance was set at 0.05.

2.5 Ethical considerations

The Ethics Review Committee of the West Visayas State University approved this study with Protocol No. WVSU.UBRERC-2019.GS-I_003. The participants were informed and consented to participate in the study. This research report is part of a larger research project on the

assertiveness of Filipino nurses. Other components of the research project are published elsewhere.

3. Results

3.1 Personal and work-related characteristics

Table 1 shows that the average age of nurses was 32.34 years (SD=8.14). More than half were females (68.6%), single (66.4%), Bachelor of Science in Nursing (BSN) degree holders (67.3%), graduates of private nursing schools (89.7%), and permanently employed nurses (78.9%). An almost equal proportion of participants from the public (50.7%) and private (49.3%) hospitals participated in the survey. The average number of years of nursing work experience and years in the present organization were 7.36 years (SD=6.41) and 5.40 years (SD=5.43), respectively. The majority were currently assigned in the medical and surgical units (43.5%). Most did not receive education and training on assertiveness in the undergraduate nursing program (90.1%). A little over half have not attended in-service seminars or conferences (52%) and trainings or workshops (54.3%) on assertiveness.

Table 1. Personal and work-related characteristics

Profile	Categories	*f*	%
Age (years)	≥ 32	89	39.9
M ± SD = 32.34±8.14	27-31	89	39.9
	21-26	45	20.2
Sex	Male	70	31.4
	Female	153	68.6
Marital status	Single	148	66.4
	Married	75	33.6
Educational attainment	BSN	150	67.3
	BSN with Masteral units	73	32.7
Type of school graduated	Public	27	12.1
	Private	196	89.7
Employment status	Permanent	176	78.9
	Casual/Contracted	47	21.1
Type of hospital	Public	113	50.7
	Private	110	49.3
Years of nursing work experience	11 and above	54	24.2
M ± SD = 7.36 ±6.41	6 to 10	59	26.5
	5 and below	110	49.3
Years in the present organization	11 and above	35	15.7
M ± SD = 5.40±5.43	6 to 10	42	18.8
	5 and below	146	65.5
Unit of assignment	Medicine/Surgery	97	43.5
	Emergency/Out-Patient	20	9.0
	Intensive/Critical	33	14.8
	Dialysis	11	4.9
	Operating Room Theater	35	15.7
	Gynecology/Obstetrics/Pediatrics	27	12.1
Pre-service education or training	Yes	22	9.9
	No	201	90.1
In-service attendance to seminars	Yes	107	48
	No	116	52
In-service attendance to trainings	Yes	102	45.7
	No	121	54.3

3.2 Level of workplace assertiveness staff nurses towards nursing colleagues, nursing management personnel, and medical doctors

Table 2 shows that nurses had a general assertiveness score of 3.61 (SD=.55). Nurses' assertiveness scores towards their nursing colleagues, the nursing management personnel, and medical personnel were 3.78 (SD=.55), 3.40 (SD=.68), and 3.65 (SD=.65), respectively. Nurses were most likely to give compliments (M=3.95, SD=.68) and allow others to express opinions

(M=3.86, SD=.70) but were less likely to provide constructive criticisms (M=3.35, SD=.73) and say no to requests (M=3.27, SD=.90).

Table 2. Level of workplace assertiveness towards colleagues, management and doctors

Assertive Behaviors	Nursing Colleagues			Nursing Management			Medical Doctors			General		
	M ± SD	I	R	M ± SD	I	R	M ± SD	I	R	M ± SD	I	R
Overall	3.78±.55	Hi		3.40±.68	Mo		3.65±.65	Mo		3.61±.55	Mo	
Giving compliments	4.27±.72	Hi	1	3.62±.97	Mo	2	3.96±.95	Hi	1	3.95±.68	Hi	1
Allowing others to express opinions	4.01±.76	Hi	2	3.76±..90	Hi	1	3.81±.90	Hi	3	3.86±.70	Hi	2
Placing requests	3.95±.74	Hi	3.5	3.62±.86	Mo	3	3.82±.77	Hi	2	3.79±.64	Hi	3
Making suggestions	3.95±.78	Hi	3.5	3.42±.94	Mo	4	3.74±.81	Hi	4	3.70±.69	Hi	4
Resolving conflicts	3.74±.91	Hi	5	3.23±.1.06	Mo	6	3.52±.97	Mo	5	3.50±.82	Mo	5
Expressing disagreement	3.57±.83	Mo	6	3.25±.93	Mo	5	3.51±.96	Mo	6	3.44±.74	Mo	6
Providing constructive criticisms	3.49±.87	Mo	7	3.15±.97	Mo	7	3.43±.94	Mo	7	3.35±.73	Mo	7
Saying no to requests	3.27±1.09	Mo	8	3.12±.1.06	Mo	8	3.42±.1.04	Mo	8	3.27±.90	Mo	8

Note: I (Interpretation), Hi (High), Mo (Moderate), Lo (Low), R (Rank)

3.3 Level of workplace assertiveness with other hospital team members

Table 3 shows that nurses were most assertive towards the institutional workers (M=3.93, SD=.93, Rank 1) and nursing aides (M=3.91, SD=.94, Rank 2) and were least assertive towards hospital chaplain or priests (M=3.16; SD=1.24, Rank 8).

Table 3. Level of workplace assertiveness with other hospital team members

Hospital Team Members	Never	Seldom	Sometimes	Usually	Always	M±SD	Rank
	Percentage (%)						
Institutional workers	2.7	4.0	18.4	47.1	27.8	3.93±.93	1
Nursing aides	3.1	3.6	18.4	48.0	26.9	3.91±.94	2
Medical Technologists	4.0	8.1	21.5	47.5	18.8	3.69±1.00	3.5
Pharmacists	4.0	7.2	24.7	44.4	19.7	3.69±1.00	3.5
Midwives	8.1	9.4	20.6	42.2	19.7	3.56±1.15	4
Administrative staff	4.0	9.9	29.1	43.9	13.0	3.52±.98	5
Physical therapists	7.6	14.3	28.7	37.2	12.1	3.31±1.10	6
Nutritionists	6.7	14.8	31.8	34.5	12.1	3.30±1.08	7
Chaplain	14.3	13.9	26.0	32.7	13.0	3.16±1.24	8

3.4 Differences in staff nurses' workplace assertiveness according to personal and work-related characteristics

Table 4 shows that staff nurses with permanent employment status had higher assertiveness than nurses with contractual employment status (t=3.240, p=.001). We also noted significant differences in the workplace assertiveness of nurses according to age (F=3.119, p=.046), years of nursing work experience (F=3.343; p=.037), and years in the present organization (F=3.881; p=.022). On the other hand, comparing nurses' assertiveness based other personal and work-related characteristics showed no significant differences (p>.05).

Table 4. Differences in workplace assertiveness based on nurses' characteristics

Independent variables	M ± SD	Test Statistics	*p*-value
Sex†		1.227	.222
Male	3.68 ± 0.55		
Female	3.58 ± 0.54		
Marital status†		-.892	.373
Single	3.59 ± 0.56		
Married	3.66 ± 0.5		
Educational attainment†		-1.150	.251
BSN	3.58 ± 0.54		
BSN with MA units	3.67 ± 0.56		
Type of school graduated†		.119	.905
Public	3.62 ± 0.46		
Private	3.60 ± 0.56		
Employment status†		3.240*	.001
Permanent	3.67 ± 0.53		
Casual/Contracted	3.39 ± 0.57		
Type of hospital†		.352	.725
Public	3.62 ± 0.53		
Private	3.58 ± 0.56		
Pre-service education or training†		-.024	.981
Yes	3.61 ± 0.52		
No	3.61 ± 0.55		
In-service seminars†		1.341	.181
Yes	3.67 ± 0.50		
No	3.56 ± 0.59		
In-service trainings†		1.256	.210
Yes	3.66 ± 0.49		
No	3.57 ± 0.59		
Age‡		3.119*	.046
32 and above	3.70 ± 0.60		
27-31	3.61 ± 0.51		
26 and below	3.45 ± 0.55		
Years of nursing work experience‡		3.343*	.037
11 and above	3.64 ± 0.52		
6 to 10	3.75 ± 0.49		
5 and below	3.52 ± 0.58		
Years in present organization‡		3.881*	.022
11 and above	3.55 ± 0.58		
6 to 10	3.82 ± 0.42		
5 and below	3.56 ± 0.56		
Unit of assignment‡		1.191	.315
Medicine/Surgery	3.58 ± 0.58		
Emergency/Out-Patient	3.84 ± 0.50		
Intensive/Critical	3.68 ± 0.42		
Dialysis	3.47 ± 0.59		
Operating Theater	3.62 ± 0.62		
Gynecology/Obstetrics/Pediatric	3.52 ± 0.48		

†t-test for independent group, ‡ANOVA with Scheffe post hoc test, *$p < 0.01$

3.5 Reasons, facilitators, and barriers to workplace assertiveness

The primary reasons, facilitators, and barriers of workplace assertiveness among staff nurses are shown in Table 5. The foremost reason of staff nurses for behaving assertively was to defend personal rights (87.9%). The number one facilitator of assertive behaviors was a sense of responsibility to patients under their care (88.8%) while the main barriers to nurses' assertiveness identified by more than half of the surveyed nurses were reprimand from nursing management personnel (57.4%) and fear of repercussions from nursing management personnel (55.6%).

Table 5. Top five reasons, facilitators, and barriers to workplace assertiveness

Reasons, Facilitators, and Barriers to Workplace Assertiveness	*f*	%	Rank
Reasons for Assertive Behaviors			
To defend personal rights	196	87.9	1
To work better with the healthcare team	187	83.9	2
To safeguard patient safety	182	81.6	3
To speak on behalf or advocate for patient's rights	180	80.7	4.5
To communicate effectively	180	80.7	4.5
Facilitators of Assertive Behaviors			
A sense of responsibility to patients in your care	198	88.8	1
A sense of respect for the patients in your care	173	77.6	2
Personal values and beliefs	172	77.1	3
Personal confidence	170	76.2	4
Personal experience and skills in assertiveness	164	73.5	5
Barriers to Assertive Behaviors			
Reprimand from nursing management personnel	128	57.4	1
Fear of repercussions from nursing management personnel	124	55.6	2
Reprimand from medical personnel	101	45.3	3
Fear of repercussions from nursing colleagues	95	42.6	5
Fear of repercussions from medical personnel	95	42.6	5
The organizational culture, climate, or work atmosphere of the hospital	95	42.6	5

Note: Multiple Response Item

4. Discussion

This study examined the level of assertive behaviors of staff nurses in two large tertiary hospitals in the Philippines. In this study, it was demonstrated that Filipino staff nurses were moderately assertive in the workplace. Filipino nurses may not be highly assertive given the generally collectivist culture in the Philippines (Oducado, 2021a). Collectivistic cultures place more value on maintaining harmonious working relationships and group identities (Lee et al., 2021). Causing disharmony and tension among teams or concerns about upsetting a colleague restrict assertiveness (Omura et al., 2018). As traditions and values provide a framework for communication and behavioral patterns of Filipinos (Ordonez & Gandeza, 2004), Filipinos are likely to be nonconfrontational and have high regard for the age-based seniority and authority (Ordonez & Gandeza, 2004). Nevertheless, it is argued that too little or too much assertiveness can be problematic (Ames et al., 2017). Similarly, a moderate or average level of assertiveness was noted in the majority of samples in a study conducted in India before assertiveness training (Kaur et al., 2018), and in a study conducted in Iran (Hamooleh et al. 2018). Limited assertiveness was reported among nurses and nursing students in another study in Iran (Larijani et al., 2017; Hadavi & Abdorrazagh Nejad, 2018). Some other nurses in South Africa admitted being lacking of assertiveness skills (Rasetsoke, 2012). Additionally, the majority of the samples of studies conducted in India among nursing students were non-assertive (Sabatina et al., 2018; Sreedevi et al., 2018). A low level of assertiveness was also noted among 50.6 percent of nursing students in Turkey (Bulut et al., 2018).

Moreover, this study found that staff nurses were less assertive towards the nursing management personnel. At the same time, reprimand and fear of repercussions from the nursing management personnel were the primary barriers to assertiveness. Nurses may be less assertive towards those in higher positions in the organization's hierarchical structure. Similarly, nurses in Malta were more assertive in their behavior with their colleagues than with medical officers and the least with the nursing management (Brincat, 2012). Nurses also reported the least barriers towards their nursing colleagues (Brincat, 2012). It has been reported that nurses encounter barriers in asserting themselves when they have to assert up in the hierarchical system found within hospitals (Thrasher et al., 2017). Power and dominance in an organizational structure are chief barriers for nurses to showcase assertive behavior (Brincat, 2012). The power differentials evident in traditional healthcare cultures and the hierarchical structure of healthcare environments can render it difficult for nurses to be assertive (Omura et al., 2018; Reese et al., 2016). On the other hand, nurse managers play a pivotal role in creating a work environment and communication culture that will allow nurses to practice assertiveness (Garon, 2012). Another

study also noted that supportive working culture facilitates nurses' willingness and ability to speak up about their concerns (Mansour et al., 2020). Hospital administrative support, positive team culture, hierarchy, and power differential were also identified in a systematic review as factors influencing East Asian nurses' willingness to voice their concerns regarding patient safety (Lee et al., 2021). Furthermore, the findings of this study disclosed nurses behaved more assertively towards those who are under their supervision, such as nursing aides and institutional workers. This result is consistent with Timmins and McCabe's (2005b) and Brincat's (2012) findings. The result of this study may also indicate that nurses may be more assertive to hospital team members they frequently interact with (Brincat, 2012).

Meanwhile, being assertive means acting as a patient advocate to safeguard their rights and the rights of their patients (Mushtaq, 2018; Oducado, 2021a). The current study's findings suggest that reasons for behaving assertively among nurses demonstrate recognition of personal rights and responsibility to patients under their care. Moreover, the present research revealed that nurses' sense of responsibility to their patients, their knowledge, skills, and confidence facilitate assertive behaviors at work. Similarly, Timmins and McCabe (2005b) found that responsibility to patients appeared as a key supporting factor for behaving assertively in the workplace. Motivation toward patient safety also promoted nurses' willingness to speak up as reported in other studies (Omura et al., 2018; Lee et al., 2021).

Interestingly, nurses in this study seemed to practice more affirmative assertive behaviors like giving compliments, allowing others to express their opinions, making suggestions, and placing requests than saying no, providing constructive criticisms, expressing disagreements, and resolving conflict. Likewise, the findings of Timmins and McCabe (2005ab) noted that nurses were more frequent in giving compliments and allowing others to express their opinion. However, nurses were less frequent in expressing their own needs, such as expressing their disagreement, giving constructive criticism, and saying no, which is the core of assertive behavior. Brincat (2012) also found that nurses were more assertive in giving compliments.

It is also remarkable that most staff nurses in this study had limited pre-service and in-service education and training on assertiveness. Almost a similar proportion of nurses in Malta indicated that they received some form of training on assertive behavior (Brincat, 2012). A study also noted gaps in the theory and practice of assertiveness (Mansour et al., 2020). While undergraduate nursing education emphasizes the need to acquire assertiveness skills, it failed to deal with some important and critical operational skills which would aid nurses in translating theory into practice (Mansour et al., 2020).

The post hoc test on this study showed that staff nurses aged 26 years old and below, with five years and below nursing work experience and years in the present organization, were significantly less assertive in the workplace. Possibly, in this study, age, years of experience, and length of service coincided with each other, wherein those who had lesser years of experience and length of service tended to be generally younger. The result of this study is similar to the findings of Maheshwari and Gill (2015), wherein nurses in India who were on regular job and greater than 50 years old were reportedly more assertive. Earlier research also noted a significant positive correlation between age and experience with assertiveness skills in a sample of psychiatric nurses in Eqypt (Abed et al., 2015). Correspondingly, novice nurses' perception of having limited knowledge and experience and age-based seniority were explained factors affecting the assertiveness of Japanese nurses (Omura et al., 2018).

5. Implications and limitations

This study provided insights on the assertiveness of Filipino nurses and the result of this research has important implications to nursing practice and education. Recognizing the relevance of assertiveness in the nursing profession, assertiveness in the workplace must be improved, supported and reinforced. Nurse managers and leaders have a pivotal role in promoting or hindering assertiveness of staff, thus are encouraged to create a work environment that will permit nurses to practice assertive behaviors. Additionally, the results of this study may be valuable towards the development of assertiveness training for staff nurses, giving priority to novice, inexperienced, and contracted staff nurses. Training of assertiveness may be started in the undergraduate program so that nurses can showcase assertiveness at the start or as they begin practicing their profession.

This study has certain limitations. This study is limited to the two tertiary hospitals among staff nurses in the Philippines. Generalization to all Filipino nurses is not possible at this point. Data were gathered at a single point in time (cross-sectional design), and our research design did not measure changes in assertiveness over time. There is also a potential for self-reported bias because of the use of a self-administered questionnaire. Future research may be conducted with larger cohort samples of nurses and among nurses in other fields of specialization. Research involving a qualitative research design may be done, and other factors relating to the assertiveness of nurses may be explored. Nevertheless, this study contributed to the body of knowledge and a better understanding of nurses' assertiveness.

6. Conclusion

Filipino staff nurses are moderately assertive in the workplace. Our study underscores that personal and work environment factors can inhibit or support assertive behaviors. The findings of this study also highlight some gaps in the assertiveness of Filipino staff nurses at work. Nurses are less assertive towards those in the higher levels of the nursing hierarchy, and the influence of the nursing management appears to be a great factor for nurses to behave assertively. Moreover, nurses have some problems in giving constructive criticism and in saying no. It is also noteworthy that pre-service and in-service assertiveness education and training have not been given much attention in the Philippines. Efforts should be made to address the barriers identified in this study to improve nurses' assertiveness. It may also be worth introducing assertion training in the undergraduate nursing program and continuing professional development of nurses. And while training for assertiveness may be beneficial to all nurses, particular attention must be given to novice or young nurses who are just starting their career.

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Author contribution

RMFO: Involved in the study conception and design, data collection and analysis, and writing the draft and final version of the manuscript. HCM: Provided guidance and supervision for the entire study and provided significant inputs and critically revised the manuscript for important intellectual content. All authors read and approved the final version of the manuscript

Conflict of interest

The authors declare that they have no conflict of interest.

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ORIGINAL RESEARCH

Nursing Students' Experiences on Clinical Competency Assessment in Ghana

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Abstract

Background: More countries are establishing licensing examination systems for nursing education, including clinical competency assessment. In Ghana, clinical competency assessment forms part of the nursing licensing examination and is perceived as the benchmark for nursing licensing examination in the sub-region. The nationalised assessment system is established with some ad hoc changes over the last decade which requires continual evaluation. It is essential to find out how students experience this assessment system.
Purpose: This study aimed to explore nursing students' experiences of the clinical competency assessment in Ghana.
Methods: An exploratory descriptive qualitative design was used in this study. Eight focus group discussions (FGDs) were conducted with 68 final year students purposively selected from eight nursing education programs. The FGDs lasted between 90 to 120 minutes. Content analysis was used to analyze the data.
Results: Although the pre-examination conference between students and examiners helped lessen students' anxiety, limited resources, incongruence in teaching, practice and assessment, inherent biases due to the unstandardised assessment system, and a financial burden compromised the quality of the assessment.
Conclusion: Clinical competency assessment is central to nursing licensing examinations; hence the ability of the system to discriminate competent and incompetent nurses otherwise cannot be overemphasised. Standardisation, training of the examiners and continuous evaluation of the assessment system are imperative for quality improvement in clinical competency assessment.

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1. Introduction

Nurses are a critical component of the health workforce globally due to the proportion of the care they provide compared to other health professions (World Health Organization, 2020). All countries need to ensure that the nurses being trained and recruited into healthcare systems are competent to provide quality and safe healthcare to the population they serve (World Health Organization, 2020). The United States of America (USA), Canada, the United Kingdom, Australia, China, South Korea, the Philippines, Japan and Ghana conduct national nursing licensing examinations to ensure that only competent nurses are licensed to provide quality and safe healthcare for patients (Amilia & Nurmalia, 2020; Christmals & Gross, 2019; Hou et al., 2019; Kim et al., 2014; Park et al., 2016; Shin et al., 2017). Other countries, such as Brazil and South Africa, are introducing such forms of assessment (Silva & Cabral, 2018). Registration of nurses is varied in different countries in terms of fees, application processes and the examination (Silva & Cabral, 2018).

Countries that use examinations to license nurses need to ensure that the content of the examination meets the quality assessment criteria (Norcini et al., 2011; Oducado et al., 2020; Tsai & Kramer, 2014). Regular research on and reviews of the assessment system, process and outcomes are necessary to keep it consistent with current trends in nursing practice and in alignment with the curriculum of Nursing Education Institutions (NEIs) (Gorham et al., 2012; Nurakhir et al., 2020; Woo & Dragan, 2012). The National Council of State Boards of Nursing of the USA, which is used as a benchmark for many countries, regularly calls for institutions to research the National Council Licensure Examination (NCLEX) for quality improvement

(National Council of State Boards of Nursing, 2020). Many studies (Gorham et al., 2012; McGibbon et al., 2014; Shin et al., 2017; Woo et al., 2009; Woo & Dragan, 2012) have been conducted and published on the licensing examinations in the USA, Canada, United Kingdom, Australia China, North Korea, South Korea, Philippines and Japan. This is important in building public confidence in nursing councils. The Council on Licensure, Enforcement and Regulation (CLEAR), an organisation dedicated to supporting nursing councils globally in the performance of the regulatory function, has a bi-annual journal that publishes studies on licensing examinations globally (Council on Licensure Enforcement and Regulation, 2020). If processes are not interrogated through research and regular reviews, quality will be compromised. Additionally, lack of stakeholder consultation can also affect the outcomes of the examination. An example was a very low pass rate (69%) in Canada when the NCLEX was adopted from the United States of America without proper stakeholder consultation (McGillis Hall et al., 2018).

A major weakness in the NCLEX was the exclusion of a clinical competency assessment. A study conducted in Korea recommended the inclusion of a clinical competency assessment, which will, in turn, lead to quality clinical performance among licensed nurses. However, the participants in the study stated that a clinical competency assessment tends to cause more stress than knowledge-oriented examinations (Shin et al., 2017). A few studies conducted on clinical competency assessment in nursing cited training of examiners and mentors, availability of resources, access to assessment tool and criteria, appropriate and prompt feedback and support form nursing educators as important factor for effective clinical competency assessment (Bifftu et al., 2016; Bradshaw et al., 2012; Immonen et al., 2019; Levett-Jones et al., 2011). Immonen et al. (2019) stressed the need for a valid and reliable clinical assessment rubrics with a clear assessment criteria as critical in clinical competency assessment systems.

Registered Nurses (RN), synonymous with professional nurses, are either trained on a three-year Diploma in Nursing programme or a four-year Bachelor of Nursing programme at the study site. The examination is in three parts: a clinical examination, a viva (oral examination) on a patient and family care study and a paper and pen examination that covers three areas, namely surgical nursing, medical nursing and a general paper (covering nursing ethics, communication, psychiatric nursing, obstetric nursing, community health nursing) (Christmals & Gross, 2019). Successful candidates are required to complete a mandatory supervised one-year internship (national service) to be licensed as a nurse.

Candidates are assigned both basic and advanced nursing skills during the examination. Basic skills include checking vital signs, bed making, bed bath, washing patients' hair, documentation, and record-keeping. Advanced nursing procedures include care of wounds, blood transfusion, intravenous infusions and medications, preparing patients for laboratory and radiological tests. These procedures and others are included in the logbook for students. They are supposed to indicate when they are taught each procedure in class, demonstrate at the clinical laboratories, and perform it at the clinical facilities (Nursing and Midwifery Council of Ghana, 1971, 2016). Although the assessment system is nationalised and centralised, there has been some ad hoc changes that have been made over the last decade. As a result, students complained that they were not uniformly evaluated, resulting in an unfair and unreliable system. There is a high risk of competent students failing and vice versa.

Students are assigned to patients randomly by the examiners and have 30 minutes to do an assessment, identify the patient's health problems and plan care. Students are subsequently assigned two clinical competency skills identified in the care plan to perform and are graded by two examiners. The examiners assign live patients; therefore, the procedures performed can vary for each candidate. Students complain that they are not uniformly evaluated, resulting in an unfair and unreliable system. Complaints include biases in the allocation of patients, examiners and procedures/tasks during clinical examinations in Ghana; no determination of interrater reliability of examiners; selection of patients for the examination is based purely on convenience. The final grade is the summation of scores for the care plan prepared by the student and the two clinical competency skills assessed.

Nursing education institutions are expected to support the licensing examination by hosting the examiners, including accommodation, meals and transportation. Most of the schools are financially constrained, so nursing students are expected to contribute financially to support the examiners. The students also bear the cost of consumables used at the examination centres. A study conducted by the regulatory body in 2013 to investigate factors that contribute to nurse and

midwife trainees' poor performance in the licensing examination focused more on the written examinations (Wilmot et al., 2013). This current study focusses on issues with the clinical competency assessment component of the licensing examination from the perspective of nursing students. Accordingly, this study explored nursing students' experiences of clinical competency assessment that forms part of the nursing licensing examination in Ghana. The study indents to identify current issues with the assessment system and how some of these issues can be solved for quality improvement.

2. Methods

2.1 Research design

A qualitative, exploratory, descriptive design was used to explore final-year nursing students' views on the assessment of clinical competency in Ghana, a sub-Saharan African country. This method was selected for the study as it enabled the participants to express their views (Creswell, 2014).

2.2 Setting and participants

Final-year nursing students from public and private nursing colleges and universities registered for the licensing examination in the study site were included in the study. The study site is geographically divided into three zones (northern, middle and southern). Two regions from each zone were chosen from which eight Nursing Education Institutions (NEIs) were selected using a quota sampling technique. Only NEIs that had successfully enrolled students for the licensing examination for at least five years were included. Three public training colleges, three public universities, one private training college and one private university, participated in this study.

After the institutions granted permission, the researcher organised information sessions with the final year students who had registered for the licensing examination. Students who were willing were asked to see a student representative and gave their names. The student representative managed the consent process. On the day of the examination, the first 8-10 candidates who came to the venue selected were included in the study as explained to the students by the representative. A total of sixty-eight (68) candidates were included in this study. They were final year student nurses who had registered to write the licensing examination.

2.3 Data collection

Data were collected after students had completed the clinical competency examination. Data collection lasted from July 2019 to September 2019. Those who consented to participate in the study were organised and seated around a table in a classroom. Students were allowed to share their experiences on the clinical competence examination before the researcher asked questions from the semi-structured interview guide.

The guiding questions were designed from the World Health Organization (WHO) Framework for building an effective assessment system (Clarke, 2011) and considered the enabling context, system alignment and assessment quality. Some of the questions asked were: Please can you share your experience about the clinical competency examination? What recommendations can you give to improve the assessment? Participants were allocated numbers to ensure confidentiality. The eight focus group discussions lasted between 90 to 120 minutes. The focus group discussions were audio-recorded with prior consent from participants. Saturation was reached when new information was provided by participants after the eight discussion.

2.4 Data analysis

Thematic content analysis was used to analyse the collected data (Hsieh & Shannon, 2005). All the audio-recorded interviews were transcribed verbatim. The transcripts were read several times to familiarise the researcher with the scripts. Two transcripts were inductively coded by two of the authors independently. A meeting was organised with all three authors to review the initial codes. Consensus was reached on the codes, which were imported into MAXQDA version 20 to manage the other seven transcripts. Similar codes were categorised under a subtheme supported by verbatim quotes from participants. Related subthemes were then clustered under three themes as presented.

2.5 Trustworthiness

The principles of credibility, transferability, dependability, and confirmability were addressed (Lincoln & Guba, 1985). Two of the authors trained, practised and taught clinical practice programmes in both public and private nursing education institutions in the study setting. This ensured an accurate representation of the context in this study. Only students who had taken the clinical competency examination were included in the study to ensure the credibility of the data collected. To ensure dependability, a semi-structured discussion guide and probes were developed using the World Bank framework concepts for building an effective assessment system (Clarke, 2011). The questions elicited information about policies guiding the examination, planning for the examination, financial implications, sections of the examination, grading of the examination, the attitude of assessors, and then recommendations to improve the quality of the assessment system. Confirmability was ensured as focus group discussions were recorded and transcribed verbatim and were used in the analysis and presentation. The opportunity was given to all participants to confirm or disconfirm comments that they have made through member checking (Lincoln & Guba, 1985). Transferability was ensured by presenting a thick description of the setting, methodology and participants in the study to aid in replication of the study. To ensure that the study sample was as representative and diverse as possible, NEIs selected included both Diploma and Bachelor degree-awarding, private and public. All four categories of NEIs have peculiar issues with the assessment of clinical competency.

2.6 Ethical considerations

Ethical approval (M190433; GHS-ERC 008/04/19) was obtained for the study. Principles of confidentiality and anonymity were upheld. Only the research team had access to the audio recordings, the transcripts and the field notes. The research team ensured trustworthiness.

3. Results

3.1 Characteristics of the participants

Eight (8) NEIs were included in the study: three public universities, three public nursing colleges, one private university and one private nursing college. Sixty-eight (68) nursing students participated in the focus group discussion, of whom 38 were females and 30 were males. Their ages ranged from 21 to 30 years, with an average age of 24 years (Table 1).

Table 1. Demographic characteristics of the participants (n=68)

Characteristics	Mean±SD	f	%
Gender			
Male		30	44.12
Female		38	55.88
Age (year)	23.99±2.83		
Studentship			
University		32	47.06
College		36	52.94

3.2 Themes

Three themes emerged from the inductive content analysis (Figure 1): the examination systems, the clinical competency assessment process and outcomes and proposals for quality improvement of the clinical competency assessment system. The themes are described and supported by verbatim quotes in this section.

3.2.1 Examination system

This theme refers to the systemic issues that affect students' performance in the clinical competency assessment. Subthemes that constitute this theme include the relationship between teaching, practice and assessment, attitudes of the examiner and the effects of limited resources.

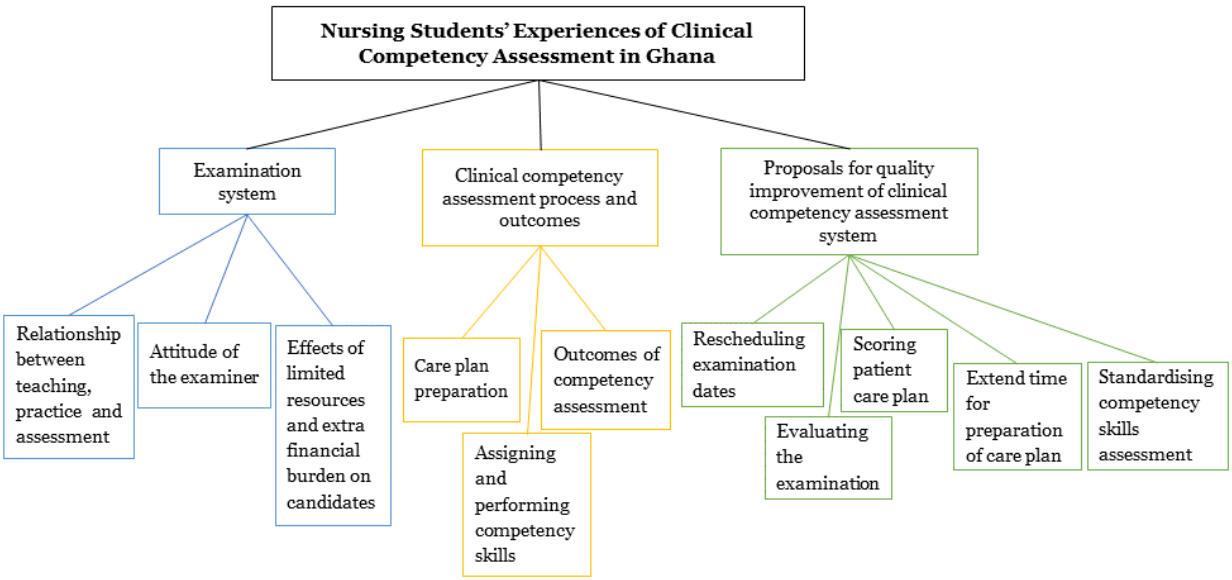

Figure 1. The major themes and sub-themes

3.2.1.1 Relationship between teaching, practice and assessment

Participants had knowledge of the policies guiding the clinical competency assessment system, which included the curriculum, number of procedures assigned to each student and the composition of the clinical examination team:

> "Clinical skills are indicated in the curriculum. Nurse educators also relay information on the competency skills that are examinable to the students so we are aware that we will be examined on both major and minor tasks."- P60

Sixteen participants mentioned the incongruence among teaching, practice and assessment. Four participants (P9, P10, P51, P67) stated that the nursing council developed the nursing procedure manual in 1995, which serves as the clinical education portfolio in the NEIs. This manual had not been updated since then. The participants stated that there was anecdotal information that the manual was being reviewed by the nursing council. The NEIs use the procedure manual in combination with other books, which makes the teaching of clinical competency skills varied from institution to institution.

> "Mostly what we have is online and then a lecturer brought a book on Basic Nursing which had some procedures, requirements and tasks. We have soft copies and some component tasks but do not know if it is revised or not. I don't have any book."- P41

> "We use manuals that were used maybe ten years ago when it is updated, we are not updated and so we continue to still use the old materials that might not be applicable now. So, what I advise we do is that, after coming out successfully with updates in the manual, students must be informed." - P10

> "I also think that the whole practical session went on well but one challenge I had was that I think we don't really practice what we are being taught so during exams we now have to look for component task and then start "chewing" the procedures and go and perform on the ward. P42

Nine participants asserted that the clinical assessment rubrics (tools) are classified documents of the regulatory body and are not available to the NEIs or the students. Students are aware that the assessment rubrics (tools) are updated by the regulatory body regularly. Still, they

only get to know some of these updates during the examination when assessors prompt them. This sometimes confuses the students. Therefore, the clinical instructors try to keep the student up to date with the expected changes in clinical procedures by sourcing information from other books and the internet to teach them so that they are able to cope with the updates in the assessment rubrics from the nursing council.

> "Frankly speaking I was found wanting because what the examiner had (assessment rubrics) was different from what was in the component task, so it was through God that I was able to do something."- P39

> "During our last period session, we heard that we had to add some things and change some things, so imagine within that short while you are supposed to forget all … you know already what you felt was right and have been doing that since first year…"- P57

There is a shortage of clinical staff, leading to a competition between teaching and actual health care duties of nurses, according to six participants (P2, P21, P38, P47, P51, P54). Also, the large number of students placed in the clinical facility makes it difficult for the clinical staff to cope with their clinical teaching roles. Much of the equipment used for the clinical competency assessment is not available in the clinical facility for students to practice with. Additionally, because of the workload, nurses do not follow the protocols as prescribed. Hence students in clinical practice get lost between what they are taught in the clinical simulation laboratories in the NEI and what is practised in the health facilities. Students believe that if the assessment tools are made accessible to the nurse educators and students, it would be helpful in their training, preparation for the competency assessment and practice:

> "… we do not have hands-on experience all the time, and even when it happens at the wards, we do not go by what is in the books they only teach us what they know or they do, they do not take us through the steps as it should be, then when you are given advance procedure sometimes you find yourself wanting."- P54

3.2.1.2 Attitudes of examiners

Fourteen participants contributed information on the challenges they experience in the examination environment. Participants were comfortable with the clinical facilities that were used for the examination because it was where they normally had their clinical placement. Eight participants stated that they had pre-examination meetings with the examination teams, which helped them relieve some of their anxiety due to fear of failure in the examination.

> "I like the that fact that we had a pre-conference, pre- exams conference with the examiners. It in a way brought us to establish some level of familiarity or relationship with them way before the exams, and in a way, for me, it reduces some tension as well." - P54

Six candidates, however, reported they were sometimes abused and traumatised by examiners when they made mistakes during the examination leading to confusion and sometimes a complete shutdown during the examination process.

> "Some of the examiners are quick-tempered so when a student is performing a task and omits something, they will just be screaming at the person causing more anxiety. Yes, and the student will become confused and when they assign another task the student cannot do it properly because he or she is totally confused." - P4

3.2.1.3 Effects of limited resources and extra financial burden on candidates

Although books and manuals were available for learning the competency skills, physical resources, equipment and the financial resources necessary for conducting a clinical competency assessment for nursing students were limited, and therefore the success of the examination was affected. Nineteen participants touched on the effects of limited resources and extra financial burden the examination exerts on candidates. According to seven participants, their preparation for the clinical competency assessment was challenging because some clinical facilities lacked the

necessary resources. Students had to contribute towards the purchase of consumables for the examination to have all the resources they needed. One participant (P64) stated: *"What I will say is that we were not having all the items we would need for the exams."*

> "The nature of the facility will determine the kind of procedures you will be given there. Regional hospitals have limited resources. There are some procedures there you need to know them but because of the nature of the hospital we abandon them because the resources are not there for us to undertake those procedures, so it limits our learning, it makes us lazier and lazier."- P2

> "Okay, when we were admitted into this school, we met books; that is procedures manual and that is what we go through or we when we go for practical session and then some say they don't understand we also go through the book and follow the procedures or the steps in carrying out such practice or procedures in the ward." -P9

Fifteen participants stated that they had numerous financial obligations during the clinical competency examination. Firstly, they paid the registration fees for the examination to the nursing council. Then they paid revision/preparation fees to the NEIs for the examination. Since the examination was organised when the NEI's students-in-training were on campus, candidates had to rent accommodation and feed themselves throughout the revision and examination period. Students also contributed to the purchase of consumables for the examination and were expected to accommodate and feed all the examiners assigned for the whole duration of the examination. One participant (P10) explained that sometimes they could not contribute enough to host the examiners due to their small class size. According to another participant (P62), some examiners complained about the quality of the accommodation and food provided for them, which, the students believed, might affect the outcome of the examination;

> "With everything you mentioned, accommodation, feeding and caring for their needs until they are done, the whole week the students have to take up, we are few in the class and we contributed a specific amount. We had to look for a good place they can stay for the week. We had to go and pay someone to feed them breakfast, snack, lunch and supper and also when they are going, they expect us also to give them something, so we also do that for them"- P62

> "Some people were making comments that the snacks take too much time. Meanwhile, we serve it at 9:30 in the morning, which is not far from breakfast, and their lunch goes at 12:30, and their supper goes at 5:00 and is like this is examination if you don't make them comfortable it will go against you." - P60

3.2.2 Clinical competency assessment process and outcomes

Process issues refer to activities that constitute the clinical competence assessment. Subthemes that emerged from the data were care plan preparation, competency skills assessment and outcomes of the clinical competency assessment.

3.2.2.1 Care plan preparation

Thirty-three participants explained their experiences of the care plan preparation. Twenty stated that some examiners welcomed them and then planned on the patients to use for the examination. However, some examiners allocated patients randomly without prior consent from the patients, which resulted in the patients not cooperating with the students during their assessment and preparation of individualised patient care plans. This affected the time students were assigned to elicit information from a patient. Seventeen participants said that, due to inadequate time allotted for the preparation of the care plan, they could not assess their assigned patients effectively and so they "cooked" (falsified) patient problems so they could finish on time and obtained the total marks for the care plan. Five participants (P2, P3, P5, P8, P9) concluded that falsifying patient problems meant that their health needs were not met:

> "During our practical examination, when we get to the ward in the morning, the examiners will come around and introduce themselves to us. After that, they will go inside the ward and then check the patients that they would want to give."- P30

> "The environment was friendly as the chief examiner herself came with a smile and treated us like a mother, so we felt so easy, and I think it was lovely (Laughs lightly)."- P12

> "Yesterday, at the male medical, the patient I was assigned to me woke him up several times, but this man won't mind me. I was being timed, 30minutes for my care plan. He wasn't talking, I would just open his eyes and sleep. I saw him having tubes and other things. I didn't know what to do so although he didn't tell me his problem, I was able to fish out some for him. So, looking at that, I will write my cooked diagnosis for the care plan."- P27

> "So in case you falsify something in order to pass the examination, without taking into consideration what the patient is facing, it will go against the patient because the person came to the hospital for his or her problem to be solved so if his or her needs are not attended to, then I don't think you are doing good to them."- P9

3.2.2.2 Assigning and performance of competency skills

Thirty-eight participants commented on the assigning of competency skills to perform. After the students have prepared the care plan, the examiners assigned a task based on the patient's problems and interventions in the care plan. Twenty-five participants stated that although they were assigned interventions they proposed, some were asked to perform the task on different patients. In contrast, others were assigned procedures they did not propose in the patient care plan. Other factors that determined the choice of competency skills that were assigned to students were favouritism (P5, P25, P38, P45), the gender of the student (P6, P10), the energy level of the examiners (P6, P9, P10, P30), assessment rubrics available (P4, P5, P11, P22, P36, P39, P41), sympathy from the examiner (P5, P38), limited facilities and time of the day (P4, P5, P11, P22, P36, P39, P41). Additionally, some students were only asked to verbally describe the competency skill and were awarded marks.

Sixteen participants asserted that some examiners shouted at students and showed their dislike for students pursuing degree programmes, while others received telephone calls during the examination process. Students also complained that they were not allowed to seek clarifications and were even compared with other students on various occasions during the competency assessment process:

> "A student had to manage patients with underwater sealed drainage and lumbar puncture. That day when the guy came out, he looked worried and when we enquired how the examination went, he was really hurt because of the choice of procedures that were assigned to him, because some of us had our normal routine procedures and we were very happy even though it was difficult." - P50

An example of the issue of the effect of the time of day on the examination was explained by P6, who said, "Assessors are always energetic at that moment in the morning, so they can examine you very well and that is the time they will be on you, they will be strict on everything but getting to the latter part, everything is comfortable and you will get it "falaa" (meaning very easy)."

The issue of oral explanations of a procedure was discussed by P67, who said, "..., but some of the procedures given to us were the examiners asked us to say it orally, so if you don't keep it in mind like how you write the written paper, you wouldn't be able to deliver... that is the aspect that I am not happy with."

P25 raised the issue of receiving calls during the examination, saying, "So they come there when you start the procedure, they receive a call, walk out and they expect you to pause when they return whatever you have done on the patient, they say they haven't seen it."

The discriminatory practices over the degree students were mentioned by P25, who said, "... one of the things they kept repeating is that "a degree nurse you've finished university, and you have come and you are a nursing officer, a diplomat has to work eight years before they achieve

this stand, so every mistake is not pardonable. You people must be sensible" I mean it moves into another form of insults."

3.2.2.3 Outcomes of the competency assessment

Five participants (P22, P23, P25, P29, P60) complained about the subjectivity of the grading of some aspects of the clinical assessment. They wondered why most examiners refuse to score the maximum mark even though they have performed a task that warrants total marks. A student (P22) stated that she overheard the examiners arguing over which mark to allocate to her on an item on the rubrics that demands privacy, which she did and was not sure why they would not have awarded total mark but instead argued about what to score. Another participant requested that the results of the clinical assessment be released as early as possible for students to know their performance:

> "I think that the subjectivity of the marking should be reduced. There should be a way to check it objectively. Most of us are victims of an examiner who gave a certain mark because of how he or she was feeling at a particular time."- P25

> "Sometimes, the examiners disagree with each other and sometimes argue inform of us." - P22

According to three participants (P22, P25, P32), they needed to provide feedback as early as possible to guide candidates who failed in their remedial examination. Additionally, one participant explained that although fabricating problems for the care plan may make the students pass, patients may be affected since their real problems may not be dealt with:

> "As for me, after our practical, I expect our examiners to communicate our results to us." - P32

> "What we tend to see is that whether you are doing it wrong or not, when you do it wrong, they will shout at you to discourage you, but when you do it right, they can't commend you for you to feel you are on the right track. … that also contributes to a poor outcome of the exams."- P23

3.2.3 Proposals for quality improvement of the clinical competency assessment system

The students proposed ways in which the quality of the clinical competence assessment system could be improved. These were clustered under six subthemes: rescheduling examination dates, evaluating the examiners, scoring patient care plan, extending the time for preparing the care plan and standardising competency skills assessment.

3.2.3.1 Rescheduling examination dates

Five participants (P22, P23, P25, P27, P60) stated that the examinations were conducted when the NEI's students-in-training were still in school. Hence, they struggled to find a place to stay during the examination. Rescheduling the licensing examination to a time when schools are on vacation could enable them to use the NEI's accommodation, thereby reducing the accommodation and financial challenges:

> "…I think they should reschedule so that the exams period will be within the normal academic calendar so that when we in the last semester for us to complete they can make or give us some time for us to write the exams together with the continuing students and just leave without the need for us to stay behind."- P22

> "In our situation right now, the first timetable that came out we are supposed to go for graduation before we come and write our written papers which is not fare. You are doing graduation and you don't know whether you will write well or not. So, I think that they should find a way to bring the licensing period in the school academic calendar so that we all fit and finish with our colleagues. Your friends have finished, and they are in their homes enjoying and you are here studying for licensure."-P23

3.2.3.2 Evaluating examination system

Eleven participants stated that the regulatory body needs to allow the students to evaluate their examiners to help the council in their appointment of examiners for subsequent examinations to improve the assessment system:

> ".. so there should be a post-examination forum where students will also voice out their problems and the challenges they went through and then with that they get to know that, okay so it is this side we are defaulting then we go according to that."- P61

> "Most often, that is what will help. You get feedback from us, we tell you what went wrong, we'll tell you the experiences we had with examiners, we will tell you each examiner per our experience she had with them and then from there probably you would know how to improve on them or avoid them."- P24

3.2.3.3 Scoring patient care plan

Nine participants noted that scoring students while planning care for patients could reduce the fabrication of patient's problems. Additionally, students could then be assessed on how they communicate with the patient and elicit information to plan care. Also, students would then be encouraged to do a systematic assessment of patients:

> "I think it is a good strategy (examiners assessing students during the patient assessment) that will go a long way to help students that are coming up and we the staffs on the ward because if that thing is brought in place (implemented), then nurses on the ward are going to learn how to assess patients and then when students come on the ward, they can do it like this, do it like that."- P38

> "I think observing the student is very okay. We have been doing it, yes, you have to assess the patient then you see some of the things between your eyes, then the patient will also have to tell you some of the things then you can write."- P1

3.2.3.4 Extend the time for preparing the patient care plan

Six participants stated that the time for preparing the patient care plan should be extended so they could assess patients properly and document their needs:

> "The 30 minutes timing for the care plan is too short, so I'm thinking it should be extended to maybe 45 minutes or something so that at least you can be able to formulate enough problems and interact with your patient well."- P37

> "So, if we get time for the assessment it will help. At least 5 or 10 minutes for the assessment and 25 minutes for the care plan. It will help us to know how to establish good rapport or good interpersonal relationship with the patient."- P50

3.2.3.5 Standardising competence assessment

Due to the challenges of assigning clinical competency skills of equal magnitude, twelve participants called for the standardisation of the competency skills to make the assessment consistent and fair. That may also increase the objectivity of the examination and result in students learning effectively. However, seven participants thought every patient has peculiar problems that need to be managed on an individual basis. Participants recommended that setting some skills such as 'intravenous cannulation and infusion', 'feeding of a patient', 'tepid sponging', 'catheter care', 'tracheostomy', 'handwashing', 'administration of medication', 'vital signs', 'wound dressing', 'oxygen therapy', 'blood transfusion', 'monitoring intake and output', 'bed making', 'admission of a patient', 'communication', 'bed bath', 'taking up and handing over', and 'educating a patient on condition' should be included in the standardised examination.

> "Let's say compulsory for that you are given 6 tasks, everybody is performing these six tasks so then we are all being rated according to that, then that one we can know that this one was able to do it, this one was not able to do it then we know it."- P60

"Someone in the medical ward who has not prepared her mind for preparing a patient to the theatre and you tell her to prepare a patient to the theatre meanwhile she has been to the surgical ward already."-P27

4. Discussion

The study sought to explored nursing students' experiences of the clinical competency assessment that forms part of the nursing licensing examination in Ghana. Eight focus group discussions were conducted with a total of 68 candidates from various nursing education institutions in Ghana. It was discovered that although the nursing regulator intended the clinical competency assessment to serve as a means of ensuring only competent nurses were registered to practice in Ghana, there were some inherent weaknesses in the assessment process that compromises the purpose (Fahy et al., 2011). First, there exist significant gap and variations between teaching and assessment which creates difficulties to students. Also, although some of the students are placed in health facilities where they are treated professionally, others had to cope with limited resources and bad behaviours of the examiners during the clinical assessment which may ultimately affect the outcomes of the assessment. Second, there are biases that exist in the management of the assessment process coupled with some technical issues such as the time available for patient assessment that the candidates think creates the complicates the validity and reliability of the assessment process. Last, the candidates recommend standardization of the teaching and assessment processes, rescheduling of the assessment period to a convenient time when some resources are available, an evaluation of the assessment system for quality improvement and apportioning enough time for patient assessment during the examination.

An assessment system is expected to possess certain quality criteria to achieve the purpose for which it was designed. Assessment is of good quality if it is valid, fair, transparent, reliable, feasible, discriminate, practicable and have an educational impact (Gulikers et al., 2004; Hudges & Quinn, 2013; Norcini et al., 2011; Tsai & Kramer, 2014). The unstandardised nature of the assessment and the biases reported by the students compromises the quality of the assessment system despite the contrary perspectives of the Nursing Council that the current assessment system has been a success and served as a benchmark for other countries within the sub-region; however, they will strengthen the gaps.

Regarding time assigned to students to perform their clinical assessment, our findings corroborate a mixed method study conducted by Fahy et al. (2011) to evaluate clinical competency assessment from the perspectives of students an preceptors. Fahy et al. (2011) reported that students find time available for their clinical assessment as opposed to what is reported by the preceptors.

We also found that although the curriculum is available for teaching and practice, educators and clinicians do not have access to the assessment rubrics, making it difficult for them to monitor continuous updates in the rubrics. Fahy et al. (2011) also reported that that students could not fully comprehend the language used in the assessment rubrics. Having the rubrics and not understanding the language is similar to not having it at all. Unfortunately for the students in our study, they currently use the outdated manual and augment it with books from other sources to guide the teaching of future nurses. Evidence-based practice demands that nursing practice protocols be updated regularly (at least five-yearly) as nursing practice and patient needs are continually changing (Committee on Patient Safety and Quality Improvement, 2015). Though the nursing council indicated that they are updating the clinical teaching manual, the current clinical protocols or the procedure manual which is the main source of clinical learning has outlived its usefulness (Burke et al., 2016; Meier et al., 2014; Oermann et al., 2016). Not making the clinical competency assessment rubrics available to guide teaching, learning and practice is not a good educational practice and may not be fair to teachers or students. Burke et al. (2016) found that being familiar with the assessment tool led to accuracy in the assessment. Educators and clinicians are well-positioned to identify gaps and strengthen the assessment rubrics to make them valid and reliable.

Certain practices implemented during the planning of the clinical competency assessment may introduce some form of bias during the examination process, which may affect the examination outcome. Students contributing money to buy consumables, host their examiners and give them gifts during the licensing examination may compromise the quality of the

examination as it provides an avenue for bias (Hughes et al., 2016; Millett, 2016). It is important for the council, as an accreditation body, to ensure that the necessary resources are available to facilitate teaching and learning. The nursing council stated that they have not permitted any NEIs to charge students any monies to host and provide gift for examiners. However, the Ministry of Health in consultation with heads of the NEIs have given approval for final year students to be billed for an amount which the NEIs use to support the examination.

Empirical evidence shows that biases (Daly et al., 2017; Numminen et al., 2014; Oermann et al., 2016) in the examination process through the allocation of the patient to students, inter-rater reliability issues, allocation of specific nursing procedures, leniency towards the female gender, time and performance of the procedures could be reduced through the introduction of a standardised method of assessment (Nyoni & Botma, 2017) to ensure the reliability of the assessment system. The Nursing Council was not in support of any standardised examination such as OSCE (Objective Structured Clinical Examination) but reiterated that students are expected to have been taught all the clinical competencies and therefore, they must be able to perform any clinical skills that is assigned to them.

The essence of feedback in the assessment of clinical competency skills in nursing has been researched extensively as it helps to develop practice, identifies areas for further development, notes patterns of performance, leads to improvement of skills, creates learning situations and supports the assessment system (Burke et al., 2016; Gurková et al., 2018; Imanipour & Jalili, 2016; Lai, 2016; Meier et al., 2014; Oermann et al., 2016; Solheim et al., 2017; Zasadny & Bull, 2015). Notwithstanding these advantages of providing feedback, the Nursing Council reiterated that providing feedback at the examination centre may be impossible since examiners are not mandated to release the examination outcome to students. Additionally, granting students the opportunity to evaluate the clinical competency assessment may help improve the assessment system (Farahani et al., 2015; Márquez-Hernández et al., 2019). Students, who are at the receiving end of the actions and inactions of the examiners and the examination process, must have the opportunity to assess the examination process/system or give feedback to the Nursing Council regarding the quality and challenges of the examination process. This is necessary for quality improvement and ensuring that the assessment system's educational impact is achieved.

5. Implication and limitations

The findings from the study outlines some implications for student nurses, examiners and the nursing council. The fact that student nurses are examined on varying clinical skills shows that some of the student may be luckier than others when it come to the allocation of clinical competency skills for licensing examination. Inadequate training of nurse educators and clinicians may decrease the confidence and expertise of examiners to assess student nurses effectively. Examiners who are lenient with students may overlook some mistake while those who are stringent will be very critical of students' performance. This therefore makes the examination unfair. Although the examination system is established, students use the challenges of the system to their benefit. This therefore affect the credibility of the assessment system.

Globally, there are many countries that are about introducing the licensing examination for nurses. Some of the new licensing examination systems include clinical competency assessment. The authors are of the view that nursing is practice-based, therefore, clinical competency assessment is essential for determining the competency levels of nursing graduates before registration.

This study has limitations. Even though the researchers selected institutions from all the geographical zones of the country under study, only eight out of 106 nursing education institutions were included in the study. The researchers cannot confirm if the results might differ when all the institutions were included. Although students outlined some positives about the assessment system, they focused more on the gaps in the assessment system that need to be addressed.

6. Conclusion

Thus study sought to describe the assessment of clinical competency of student nurses in in Ghana. The study illuminated the design, administration and assessment of clinical competency assessment. Although the intention of the regulatory body is to ensure that only competent nurses are licensed to practice, inherent challenges and weaknesses in the assessment systems

compromise the quality of the process. While some students experienced a congenial environment during the assessment process, others were vocal about the unprofessional behaviour of examiners, financial burden inflicted by the examination process, unstandardised nature of the examination and its associated biases. Students resolved that the assessment rubrics need to be made available to students, nurse educators and clinicians to guide teaching, formative assessment and preparation for the summative assessment. Continuous quality improvement studies should also be instituted to feed the council with data for evidence-based continuous improvement.

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Author's contribution

The first author (OAB) conducted the study under the guidance of the second author (CDC) and third author (SJA). All the authors (OAB, CDC, SJA) were involved in the conceptualisation, data collection, analysis and manuscript writing.

Conflict of interest

There is no conflict of interest to declare in this study.

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