Nurse Media

JOURNAL OF NURSING

Volume 14 Number 1 , April 2024

Articles

- Assessment of Entrepreneurial Leadership among Undergraduate Nursing Students: The Case from Thailand
- "A life without a supervisor is like a seed that never grows": Students' Experiences of Undergraduate Nursing Research Supervision
- The Effect of Mindfulness-Based Stress Reduction on Restless Legs Syndrome in Hemodialysis Patients: A Randomized Clinical Trial
- Measures of Nursing Environment Multidimensionality and Patient Centricity Using Importance-Performance Map Analysis
- Triggers of Workplace Violence in Emergency Departments: A Qualitative Study
- Individual Characteristics, Adherence, and Barriers to Medication Adherence of Hypertensive Patients at the Indonesia - Timor Leste Border
- Perceived Stress, Sexual and Marital Satisfaction among Married Healthcare Workers in Nigeria
- The Effect of Pelvic Rocking Exercise with a Birth Ball and SP6 Acupressure on Duration of the First and Second Stage of Labor
- Non-comorbid Respiratory Factor and Work of Breathing in Pediatric COVID-19 Patient: How is Their Synergistic Correlation with the Level of Care?
- The Associated Factors of Quality of Life among Stroke Survivors: A Study in Indonesia
- Relationship between Nurses' Attitudes and Satisfaction with Bedside Shift Reports and Patient Safety Culture
- The Effect of Music Therapy on Adult Patients' Heart Rate: A Meta-Analysis
- Targeting Smoking Triggers: A Nurse-led Intervention for Tobacco Smoking Cessation
- Anatomical Points of Cupping Therapy for Musculoskeletal Pain: A Systematic Review

Accredited by the Ministry of Research and Technology/National Research and Innovation Agency, Republic of Indonesia, No. 148/M/KPT/2020

Published by

Department of Nursing
Faculty of Medicine Universitas Diponegoro
Semarang, Indonesia
Available online at https://medianers.undip.ac.id

NURSE MEDIA JOURNAL OF NURSING	VOLUME	NUMBER	YEAR	PAGES	ISSN
	14	1	2024	1-159	2087-7811

e-ISSN: 2406-8799
p-ISSN: 2087-7811

Nurse Media Journal of Nursing

Volume 14 Number 1, April 2024

Accredited by
Ministry of Research and Technology/National Research and Innovation Agency,
Republic of Indonesia (Decree No. 148/M/KPT/2020)

Editorial Office
Department of Nursing
Faculty of Medicine, Universitas Diponegoro
Jl. Prof. Soedarto, SH., Tembalang, Semarang, Indonesia, 50275
Email: media_ners@live.undip.ac.id
Website: https://medianers.undip.ac.id

EDITORIAL TEAM

1. **Editor-in-chief**
   Meira Erawati
   Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia

2. **Editorial board**
   - Andrew Cashin
     Southern Cross University, Australia
   - Rozzano C. Locsin
     Department of Nursing, Tokushima University, Japan
   - Yati Afiyanti
     Faculty of Nursing, Universitas Indonesia, Indonesia
   - Sri Warsini
     School of Nursing, Universitas Gadjah Mada, Indonesia
   - Jennieffer A Barr
     School of Nursing and Midwifery, Central Queensland University, Australia
   - Maarten M Kaaijk
     School of Nursing, Hanze University of Applied Sciences, Netherlands
   - Ferry Efendi
     Faculty of Nursing, Universitas Airlangga, Indonesia
   - Mardiyono Mardiyono
     Department of Nursing, Poltekkes Kemenkes Semarang, Indonesia
   - Faustino Jerome Gulle Babate
     Beta Nu Delta Nursing Society, Philippines
   - Tantut Susanto
     School of Nursing, Universitas Jember, Indonesia
   - Cyruz P. Tuppal
     St. Paul University Philippines System, Philippines
   - Suhartini Ismail
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia

3. **Associate editors**
   - Sri Padma Sari
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Nana Rochana
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Meidiana Dwidiyanti
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Fatikhu Yatuni Asmara
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia

4. **Managing/technical editors**
   - Asih Nurakhir
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Pradipta Ary Pamungkas
     Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Septi Harni Wahyuningtyas
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia

Copyright © 2022, NMJN, p-ISSN 2087-7811, e-ISSN

AIMS AND SCOPE

The Nurse Media Journal of Nursing (NMJN) is an international nursing journal which publishes scientific works of nurses, academics and practitioners. NMJN welcomes and invites original and relevant research articles in nursing as well as reviews (systematic and meta-analysis) and case reports.

This journal encompasses original research articles, reviews (systematic and meta-analysis), and case studies, including:
- Adult nursing
- Emergency nursing
- Gerontological nursing
- Community nursing
- Mental health nursing
- Pediatric nursing
- Maternity nursing
- Nursing leadership and management
- Complementary and Alternative Medicine (CAM) in nursing
- Education in nursing

PUBLICATION INFORMATION

The Nurse Media Journal of Nursing (NMJN) is published three time a year, every April, August and December.

For the year 2022, 3 issues (Volume 12, Number 1 (April), Number 2 (August), and Number 3 (December)) are scheduled for publication.

The journal is published by the Department of Nursing, Faculty of Medicine, Universitas Diponegoro and available at https://medianers.undip.ac.id.

JOURNAL CITATIONS

Scopus ID : 21101019708
CiteScore in Scopus : 0.4 (2021), 1.0 (2022)
SJR in Scimago : Q4
Google Scholar h-index / i10-index : 20/54
Total articles published in Google Scholar : 231
Total citations in Google Scholar (total) : 1830

INDEXING AND ABSTRACTING

The Nurse Media Journal of Nursing has been covered (indexed and abstracted) by the following indexing services:

- Scopus
  (https://www.scopus.com/sourceid/21101019708)
- Science and Technology Index (SINTA Score = S1)
  (*https://www.sinta.ristekbrin.go.id/journals/detail?id=914)*
- Directory of Open Access Journal (DOAJ).
  (*https://doaj.org/toc/2406-8799?*)
- Google Scholar;
  (*https://scholar.google.co.id/citations?user=Gs6nEgkAAAAJ&hl=en*)
- Portal Garuda/Indonesian Publication Index (IPI);
  (*http://id.portalgaruda.org/?ref=browse&mod=viewjournal&journal=1284*)
- Indonesian Scientific Journal Database (ISJD)
  (*http://isjd.pdii.lipi.go.id/index.php/Direktori-Jurnal.html*)
- ASEAN Citation Index
  (*https://www.asean-cites.org/index.php?r=contents%2Findex&id=9*)
- EBSCO
  (*https://atoz.ebsco.com*)
- Garba Rujukan Digital (GARUDA)
  (*http://garuda.ristekdikti.go.id/journal/view/1284*)
- SHERPA/ROMEO
  (*http://sherpa.ac.uk/romeo/search.php?issn=2087-7811*)
- WORLDCAT
  (*https://www.worldcat.org/search?q=so%3A%22NURSE+MEDIA%22&qt=results_page*)
- Microsoft Academic
  (*https://academic.microsoft.com/journal/2764736586*)
- Crossref
  (*https://search.crossref.org/?q=2406-8799*)
- BASE
  (*https://www.base-search.net*)

TABLE OF CONTENTS

Editorial Team ii
Aims and Scope, Publication Information, Journal Citation iii
Indexing and Abstracting iv
Table of Contents .... v-vi

1. Assessment of Entrepreneurial Leadership among Undergraduate Nursing Students: The Case from Thailand *(Chawapon Sarnkhaowkhom, Siriporn Santre, Payao Phonsuk, Nathatsanan Wongtawee, Siriwimol Piansamer, Ajjita Laohapisitpanich, Wiyada Suriyalerd, Natthakarn Supapote, Thunyathon Kaewmuean, Napakaed Hosangon, Siriphorn Mathaworn, Parichat Phikunthong)* 288-299
2. "A life without a supervisor is like a seed that never grows": Students' Experiences of Undergraduate Nursing Research Supervision *(Olufemi Oyebanji Oyediran, Olamide Hope Olafare, Ifeoluwapo Oluwafunke Kolawole, Emmanuel Olufemi Ayandiran, Iyanuoluwa, Oreofe Ojo, Boluwaji Reuben Fajemilehin)* 300-315
3. The Effect of Mindfulness-Based Stress Reduction on Restless Legs Syndrome in Hemodialysis Patients: A Randomized Clinical Trial *(Zahra Delshad, Mohammad Aghajani)* 316-324
4. Measures of Nursing Environment Multidimensionality and Patient Centricity Using Importance-Performance Map Analysis *(Andy Andy, Salsabilla Maula Zalfa El-Hamzah, Ferdi Antonio)* 325-339
5. Triggers of Workplace Violence in Emergency Departments: A Qualitative Study *(Ibrahim Ayasreh, Ferial Hayajneh, Rana Al Awamleh, Mohammed ALBashtawy, Abdullah Al-Khawaldeh)* 340-352
6. Individual Characteristics, Adherence, and Barriers to Medication Adherence of Hypertensive Patients at the Indonesia - Timor Leste Border *(Pius Almindu Leki Berek, Bambang Budi Siswanto, Dewi Irawati, Wisnu Jatmiko)* 353-366
7. Perceived Stress, Sexual and Marital Satisfaction among Married Healthcare Workers in Nigeria *(Matthew Idowu Olatubi, Olamide Olayinka, Olufemi Oyebanji Oyediran, Grace Oluwaranti Ademuyiwa, Taiwo Omotayo Dosunmu)* 367-379
8. The Effect of Pelvic Rocking Exercise with a Birth Ball and SP6 Acupressure on Duration of the First and Second Stage of Labor *(Karningsih Karningsih, Dwi Purwanti, Fauziah Yulfitria, Gita Nirmala Sari, Een Nuraenah)* 380-389
9. Non-comorbid Respiratory Factor and Work of Breathing in Pediatric COVID-19 Patient: How is Their Synergistic Correlation with the Level of Care? *(Defi Efendi, Maria Dyah Kurniasari, Mega Hasanul Huda, Raudha Ilmi Farid, Yohanes Andy Rias, Yogi Prawira, Nina Dwi Putri, Ayuni Rizka Utami, Titik Ambar Asmarini, Pande Lilik Lestari, Pricilia Mais, Abram Babakal)* 390-403
10. The Associated Factors of Quality of Life among Stroke Survivors: A Study in Indonesia *(Fitria Handayani, Reni Sulung Utami, Chandra Bagus Ropyanto, Niken Safitri Dyan Kusumaningrum, Yuni Dwi Hastuti)* 404-413
11. Relationship between Nurses' Attitudes and Satisfaction with Bedside Shift Reports and Patient Safety Culture *(Samara Jaber, Mirna Fawaz, Ahmad Rayan, Nisser Alhroub, Mohammad Suliman, Mohammed ALBashtawy, Rasmieh Al-Amer, Abdullah Alkhawaldeh)* 414-422

12. The Effect of Music Therapy on Adult Patients' Heart Rate: A Meta-Analysis *(Kamila Alammar, Omar Ghazi Baker, Areej Alotaiba, Amwar Alkhunaizi)* 423-436
13. Targeting Smoking Triggers: A Nurse-led Intervention for Tobacco Smoking Cessation *(Sadeq Al-Fayyadh, Ali Hussein Alek Al-Ganmi, Musaab Majid Abdulwahhab, Shaymaa Mohammed Hussein, Linda Cook, Abdulellah Al-Solais, Mayada Sabri)* 437-451
14. Anatomical Points of Cupping Therapy for Musculoskeletal Pain: A Systematic Review *(Aris Setyawan, Isma Nur Hikmah, Eka Oktavianto, I Made Moh. Yanuar Saifudin)* 452-465

Author Guidelines App.1-9
Copyright Transfer Agreement App.10
Copyright Transfer Agreement Form........ App.11
Publication Ethics and Malpractice Statement........ App.12-14
Reviewer Acknowledgment........ App 15
Submission Information App.16
Subscription Information........ App.17

[This page is intentionally left blank]

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):1-15, April 2024
https://doi.org/10.14710/nmjn.v14i1.53987

ORIGINAL RESEARCH

Stressors and Coping Strategies as Perceived among Nursing Students during Related Learning Experience (RLE)

Geraldine S. Ridad[1], Haniya S. Angintaopan[1], Princess Haniefa Mae K. Ayunan[1], Saipoden M. Manalocon[1]

[1]*College of Health Sciences, Mindanao State University (MSU) - Iligan Institute of Technology, Iligan City, Philippines*

Article Info

Article History:
Received: 29 April 2023
Revised: 13 March 2024
Accepted: 19 March 2024
Online: 30 April 2024

Keywords: Curriculum; nurses; nursing students; psychological adaptation

Corresponding Author:
Geraldine S. Ridad
College of Health Sciences, Mindanao State University (MSU) - Iligan Institute of Technology, Iligan City, Philippines
Email:
geraldine.ridad@g.msuiit.edu.ph

Abstract

Background: Stress in relation to academic studies is identified to be one of the reasons behind suicide cases in higher education institutions around the world. Locally, there is none to less studies that explored this area among nursing students. As stress is inevitable in nursing students' Related Learning Experience (RLE), recognizing the stressors that affect their quality of RLE is necessary.
Purpose: This study aimed to investigate the stressors and coping strategies that nursing students commonly use in managing stress during their RLE and their relationship to each other.
Methods: A descriptive correlational research design with total enumeration sampling was employed. A pilot-tested questionnaire was used to gather data from 191 junior and senior nursing students from two nursing schools in Iligan City. Weighted mean, standard deviation, percentages, and Spearman rho were used to analyze the data.
Results: The findings show that the "Clinical Instructor" (Mean=3.01) is perceived to cause higher stress among all the intrapersonal and interpersonal stressors identified. Students highly utilize both intrapersonal (Self-Concept Mean=3.75) and interpersonal strategies (Role Function Mean=4.13, Interdependence Mean=3.46) to cope with stress. When students' clinical "skill confusion" increases, they tend to work less with others (r=-0.259, *p*=0.000). When "staff nurses" cause them less stress, their use of positive "self-concept" decreases as well (r=0.152, *p*=0.035). Furthermore, when students are stressed with their "Duty-mates," they rely more on "physiological" coping mechanisms (r=0.160, *p*=0.027). When their "clinical instructor" causes them stress, they cope less with "physiological" (r=-0.237, *p*=0.001) and "interdependence" strategies (r=-0.317, *p*=0.000).
Conclusion: Among all the stressors, clinical instructor causes more stress to the students. The students' perceived stressors affect their effective use of intra and interpersonal coping strategies. Nurse educators, nursing schools and regulating bodies can consider these results in designing a holistic curriculum and helping students manage stress healthily.

How to cite: Ridad, G. S., Angintaopan, H. S., Ayunan, P. H. M. K., & Manalocon, S. M. (2024). Stressors and coping strategies as perceived among nursing students during related learning experience (RLE). *Nurse Media Journal of Nursing, 14*(1), 1-15. https://doi.org/10.14710/nmjn.v14i1.53987

1. Introduction

The rate and level of stress and depression among students in different academic fields is alarming (El Ansari et al., 2014; Monteiro et al., 2014). For the past two years, there were approximately three completed suicide cases in a higher education institution in Southern Philippines, with one of the primary causes identified to be stress in relation to their academic studies (Mindanao State University-Iligan Institute of Technology Clinic, 2018). At present, World Health Organization (WHO) claims that more than 700,000 adolescents die to suicide yearly. For many years, it has become a serious public health concern (World Health Organization, 2023). In India, academic stress is identified to be one of the reasons behind suicide cases among students in higher education institutions (Hindustan Times, 2023). In fact, many studies associate stress to increased adolescents' risk for suicidal behavior. In the presence of stress, factors that are biologic and cognitive in nature, including personality factors, such as being perfectionist, increase suicidal ideation and behavior (O'Connor et al., 2020; Stewart et al., 2019).

Stress is defined as a particular relationship between the person and the environment appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being (Hutmacher, 2021). However, it may be defined differently by people depending on the situation they are in (Fink, 2016). In the life of nursing students, juggling academic classes, clinical and community duties, and other responsibilities or workload, stress is inevitable. In fact, globally, nursing is considered the most challenging and stress-provoking among all other professions (Ching et al., 2020; Rayan, 2019). Many studies claimed that nursing students endure more stress from various sources than other non-nursing students (Ching et al., 2020; Tharani et al., 2017).

Several studies identified various sources of stress for students under the nursing program (Alghamdi et al., 2019; Lavoie-Tremblay et al., 2022; Milton-Wildey et al., 2014). They are summarized into academic, clinical, social, and personal stressors. Some of them claimed that academic stressors cause higher stress than all other sources which involves large bulk of workload, demanding schedules for different course subjects, exhausting course requirements that entail long hours of studying (Alghamdi et al., 2019; Lavoie-Tremblay et al., 2022; Milton-Wildey et al., 2014). Other studies include the lack of time for rest and leisure, tests, or exams in varying mode, low or failing grades, meeting deadlines and expectations (Chaabane et al., 2021; McCarthy et al., 2018).

On the contrary, several studies also claimed that students' clinical training is the highest source of stress among students (Admi et al., 2018; Ching et al., 2020; Aljohani et al., 2021; Chaabane et al., 2021). The students' clinical training or Related Learning Experience (RLE) is the core component of nursing education, as it is basically skills or practice-based, which makes nursing unique among all other professions. In the Philippines, according to the Commission on Higher Education Memorandum Order No. 14, 2009, a nursing student is required to complete 2,346 hours of RLE. This is composed of teaching-learning opportunities designed to develop the competencies of students utilizing processes in various health situations (Commission on Higher Education, 2009). However, this requirement can be stressful to the students. Their clinical training might even impact how they perceive stress on their future nursing career (Aljohani et al., 2021; Chaabane et al., 2021; Lavoie-Tremblay et al., 2022). Clinical stressors include lack of confidence in one's skills, unfamiliarity with the clinical setting, technology or equipment, fear of committing errors, patient care itself and harming the patients (Admi et al., 2018; Aljohani et al., 2021; Chaabane et al., 2021; Ching et al., 2020). Other studies include witnessing death and suffering of patients, negative relationships with clinical instructor and hospital staff, disconnection of theory from actual clinical practice, as well as the noise, smell, and crowdedness of hospitals (Al-Gamal et al., 2018; Bam et al., 2014).

Regrettably, stress can have numerous negative effects on student nurses. Stress can affect health and memory, decrease concentration or ability to focus and motivation leading to poor academic performance. Successively, decreased academic performance can lead to higher stress levels, catching the student in an unhealthy cycle of distress. It adversely affects the students' well-being and quality of life (Ching et al., 2020; Durgun Ozan et al., 2020; Lavoie-Tremblay et al., 2022; Ribeiro et al., 2018). As increased stress in the clinical area affects memory and attention, it also increases the risk of committing errors especially in drug administration, as well as decreases one's capacity to promptly recognize and address critical needs of the patients (Alvarez et al., 2019).

In general, students cannot eradicate stress, but they can reduce it, and so coping strategies is an element that helps to preserve their psychosocial well-being. It is the deliberate use of cognitive and behavioral strategies to manage internal or external demands or any stressful events. It aimed to preserve mental health by overcoming stress instead of avoiding it. These coping strategies could either be helpful or less helpful. It could bring out good results when used successfully, and psychological distress when used unsuccessfully (Lavoie-Tremblay et al., 2022; Mahomed et al., 2019).

Indeed, stress is recognized to affect the physical and psychological well-being and quality of life of nursing students. Current studies that explore stressors among nursing students were of international origin which involve diverse social, cultural, and environmental factors (Aljohani et al., 2021; Alvarez et al., 2019; Cheng et al., 2023). Internationally, a lot of studies (Admi et al., 2018; Aedh et al., 2015; Alghamdi et al., 2019; Bam et al., 2014; Ching et al., 2020; Hirsch et al., 2018; Ismaile, 2017; Lavoie-Tremblay et al., 2022; Msiska et al., 2019; Shdaifat et al., 2018; Toqan et al., 2023) and systematic reviews (Chaabane et al., 2021; Labrague et al., 2017; McCarthy et al., 2018; Ribeiro et al., 2018) explore the various sources and levels of stress and coping mechanisms among nursing students in the many facets of their nursing education, especially in their academic and clinical trainings. Locally, only one study (Labrague et al., 2018) was found that explored stressors and coping strategies among 153 nursing students in the Northern Philippines but none in the Southern Philippines. Two other studies (Labrague, 2021; Labrague, 2022) from the same author explore stress and nursing students' coping skills during the Covid-19 pandemic in the Central Philippines. Moreover, most of the studies (Monteiro et al., 2014; Rayan, 2019) explored the influence of various factors such as demographics (age, gender, and emotion), mindfulness and self-efficacy on students' coping and stress, but none explores how stressors influence their utilization of coping strategies. Lastly, there is an increased need and urgency to conduct the study, as stress was being identified as one of the causes of completed suicides in a university in Southern Philippines. Hence, this study aimed to investigate the stressors and coping strategies that nursing students commonly used during their RLE and their relationship to each other.

2. Methods

2.1. Research design

This study used a descriptive correlational research design to describe the common clinical stressors of the selected nursing students during their RLE and their coping strategies. It is deemed to be the most appropriate design (Polit & Beck, 2022) to determine any significant relationship between the independent variable, stressors and the dependent, students' coping strategies.

2.2. Setting and samples

This study employed total enumeration sampling with a total of one hundred ninety-one (191) junior and senior nursing students. Two out of the four nursing schools in Iligan City, Southern Philippines, consented to participate in the study. One school is a government institution, while the other is a private one. The names of the participating schools would not be divulged to uphold confidentiality as per their request. The return rate was 100% from the two selected schools. The transition of the new educational system which is the K-12 curriculum resulted to the lack of second year college students. Thus, the selection of the respondents was delimited to the third- and fourth-year nursing students who were known to already have clinical exposures. They were officially enrolled during the second semester of school year 2019. These nursing students were exposed to related learning experience for an estimated 153 hours for the whole semester having four rotations each for three weeks and eight hours per day of duty. They were also at least 18 years old. First year students were excluded from the study. Students who did not complete at least four clinical rotations during the second semester of school year 2019 were also excluded.

2.3. Data collection

The researchers categorized the stressors into interpersonal and intrapersonal based on Betty Neuman's System Model (McEwen & Wills, 2019). Coping strategies were also categorized into self-concept, physiological, role function, and interdependence according to Roy's Adaptation Model (Roy, 2009). However, existing research instruments do not gather the data necessary to address the objectives of the study, which are the stressors and coping strategies of nursing students during RLE based on the two models. Hence, a researcher-made questionnaire, a Likert scale type questionnaire was used. Questions were constructed from related literatures, various books, journals, and personal experience of the authors themselves. The crafted instrument was checked by seven experts in the field for content validity. Selected subject matter experts (SMEs) in the field of study were three guidance counsellors and four nurses. The three guidance counselors have worked in the university for at least 15 years. They have conducted several studies related to stress and coping strategies of university students in general. Two nurses were Clinical Instructors and two were staff nurses who have also worked for at least 15 years in their respective fields. All of them have conducted studies related to stress and coping. The seven SMEs evaluated each item of the constructed questionnaire with content validity ratio that ranges from 0.84 to 1. Five items that did not reach at least 0.99 or above the critical value were removed. The final questionnaire has 55 items with two parts: the first part is the identified clinical stressors, which is divided into two subsections: interpersonal and intrapersonal; and the second part is the identified coping strategies, which is also divided in another two subsections: interpersonal and intrapersonal. The students' perceived interpersonal and intrapersonal stressors and effective coping strategies were determined using a 5-point Likert Scale; 1-Never, 2-Almost Never, 3-Sometimes, 4-Most of the time, 5-Always. The respondents' answers relating to their perceptions regarding the stressors were scored as: Highly Stressor (4.25-5.00), Quite a bit of Stressor (3.43-4.24), Moderately Stressor (2.82-3.42), Some Stressor (1.81-2.81), and Low Stressor (1.00-1.80). Whereas responses regarding the coping strategies utilized by the respondents were interpreted as: Very High Coping Strategy (4.25-5.00), High Coping Strategy (3.43-4.24), Moderate Coping Strategy (2.82-3.42), Low Coping Strategy (1.81-2.81), Poor Coping Strategy (1.00-1.80). The instrument was also pilot tested to determine the questionnaire's reliability. The Cronbach's Alpha of .854 with 35 items for the clinical stressors and .840 with 20 items for coping strategies indicated that the instrument had high reliability. Demographic data on age and sex were also obtained using the instrument. Data were gathered for three months from February 18 to May 18, 2019.

2.4. Data analysis

The researchers tallied, organized, and analyzed the actual data from the respondents using the SPSS software version 19. Weighted mean, standard deviation, and percentages were used to describe the clinical stressors and coping strategies of the selected nursing students. Spearman correlation coefficient was used to determine the degree of correlation between the two variables, the stressors, and coping strategies. P-value was used to determine the significance of relationships between the independent variable and the dependent variable.

2.5. Ethical considerations

Permission was sought from the College of Nursing Research Ethics Committee to conduct the study. This is to ensure that the study was conducted as thoroughly and ethically as possible. This study was granted ethical clearance and approved by the College of Nursing Research Ethics Committee, MSU-IIT (02/16/2019). Proper communication and coordination were done with and through the Deans of the selected Nursing Schools in Iligan City, the Clinical Coordinators, and College Evaluators. After the study was approved, the respondents were informed about the study in complete detail before obtaining their consent. They were assured that they would have full confidentiality throughout the study and data obtained would not be disclosed elsewhere, except for the intended study and certainly would not be used against them. The respondents were provided an opportunity and enough time to ask questions, which have been answered to the best of the researchers' ability. Therefore, the individuals have not been forced to give consent. It was freely given by the students who volunteered to participate in the study.

3. Results

3.1. Demographic characteristics of the respondents

A total of 191 nursing students completed the questionnaire with 100% return rate. As portrayed on Table 1, the majority of them are females, which accounts 76%, while males comprise only 24%. The respondents were at least 19 years of age; more than half (61%) of them were 21-22 years old while the rest (39%) were 19-20 years old.

Table 1. Frequency distribution of the respondents according to age and gender

Characteristics	Frequency (f)	Percentage (%)
Gender		
Female	146	76.4
Male	45	23.56
Age (year)		
19-20	70	36.65
21-22	121	63.35

3.2. Perceived intrapersonal stressors of nursing students during RLE

Table 2 portrays the intrapersonal stressors that commonly caused or increased nursing students' stress level during their RLE subcategorized into knowledge insufficiency, fear of clinical area, and skills confusion. As depicted in the table, intrapersonal stressors are considered by the respondents as some stressor or rarely caused them stress. Most students revealed that being not certain with the protocols in the clinical area and the etiology and disease condition of the patient causes them some stress under Knowledge Insufficiency category. Under Fear of the Clinical Area, the handwritings in the patient's chart that are difficult to read and understand give them moderate stress. Being unable to systematically perform a certain procedure as presented in the book or following the procedures manual also give them moderate stress, under Skills Confusion.

Table 2. Perceived intrapersonal stressors of nursing students during RLE

Stressors	Mean	(SD)	Interpretation
Intrapersonal			
Knowledge Insufficiency	*2.43*	*.846*	*Some Stressor*
Not certain with the protocols in the clinical area.	2.57	.830	Some Stressor
Not certain with the procedures I'll be performing to my patient.	2.53	.839	Some Stressor
Not certain with the etiology and disease condition of my patient.	2.57	.764	Some Stressor
Not certain with the drugs of my patient	2.52	.863	Some Stressor
Not certain with my general and specific objectives before going to duty	1.97	.934	Some Stressor
Fear of Clinical Area	*2.73*	*0.984*	*Some Stressor*
Worried with certain protocols of the hospital	2.79	1.055	Some Stressor
Worried with the location of equipment and drugs in the clinical setting	2.69	.965	Some Stressor
Worried with the location of the respective wards or departments of the hospital	2.39	.898	Some Stressor
Worried that the institution is not conducive for learning.	2.37	.953	Some Stressor
Worried that the handwritings in the patient's chart are difficult to read and understand	3.41	1.047	Moderately Stressor
Skills Confusion	*2.66*	*0.902*	*Some Stressor*
Not able to systematically perform a certain procedure as presented in the book or manual.	2.91	.907	Moderately Stressor
Not able to follow the prioritization of the problems identified in my nursing care plans.	2.77	.888	Some Stressor
Not able to apply and perform all the interventions listed on my nursing care plans.	2.57	.797	Some Stressor
Not able to check and evaluate my patient's condition adequately after doing nursing interventions and medications are given.	2.50	.945	Some Stressor
Not able to anticipate the need of my patient in accordance with his/her situation	2.54	.972	Some Stressor

3.3. Perceived interpersonal stressors of nursing students during RLE

Table 3 shows the interpersonal stressors that caused or increased students' stress level during their clinical exposure subdivided into staff nurses, duty-mates, clinical instructor, patients, and significant other/s. Similar with intrapersonal, these interpersonal stressors caused students some stress. It can also be noted that the Clinical Instructor factor is considered a moderately stressor, which causes students higher stress among all the other identified stressors with the highest mean of 3.01. One of the circumstances that very often gives them stress is when their clinical instructor converse or scolds them in a loud tone of voice. Under Staff Nurses factor, students identified that situations like when the staff nurses offer them an opportunity to perform a procedure without their clinical instructor knowing it give them moderate stress. Likewise, unable to answer or satisfy patient and/ or their SOs on any of their queries caused moderate stress.

3.4. Perceived intrapersonal and interpersonal coping strategies during RLE

Table 4 depicts the coping strategies that the respondents commonly used to manage stress during their clinical exposures, categorized into intra- and interpersonal. Students recognized coping strategies involving Self-Concept, Physiological care, Role Function, and Interdependence to be effective and helpful in managing and dealing stress during their RLE. They very often employ all the identified strategies or consider them High Coping strategy, except for Physiological which they only consider a Moderate Coping strategy.

Table 3. Perceived interpersonal stressors of nursing students during RLE

Stressors	Mean	(SD)	Interpretation
Interpersonal			
Staff Nurses	*2.70*	*0.941*	*Some Stressor*
To establish rapport to the staff nurses	2.59	.859	Some Stressor
To approach the staff nurses	2.51	.876	Some Stressor
When my concerns and queries are not entertained by the staff nurses	2.77	.917	Some Stressor
When I do not know who the staff nurses on-duty during my shift are	2.79	.974	Some Stressor
When the nurses offer me an opportunity to perform a procedure without my clinical instructor knowing it	2.85	1.078	Moderately Stressor
Duty-Mates	*2.33*	*1.049*	*Some Stressor*
To establish rapport with my duty mates	2.10	1.161	Some Stressor
To coordinate and/or collaborate with my duty mates.	2.09	1.022	Some Stressor
When I do not know who my duty mates are	2.27	1.095	Some Stressor
When I cannot accomplish any task(s) with my duty mates	2.55	1.034	Some Stressor
When I cannot gain knowledge and skills from my duty mates	2.63	.930	Some Stressor
Clinical Instructor	*3.01*	*1.090*	*Moderately Stressor*
When my clinical instructor is present during a procedure I am performing	2.85	1.116	Moderately Stressor
When my clinical instructor converse with me in a loud tone of voice	3.39	1.225	Moderately Stressor
When my clinical instructor has high expectation of me	3.24	1.102	Moderately Stressor
When I cannot gain knowledge and skills from my clinical instructor	2.85	.942	Moderately Stressor
To approach my clinical instructor	2.74	1.064	Some Stressor
Patients and significant other/s	*2.79*	*1.056*	*Some Stressor*
To build rapport with my patients and their significant others	2.63	1.072	Some Stressor
To approach my patient(s) and/or their significant other(s)	2.60	1.114	Some Stressor
If whether my patient and their significant others accept me as their primary care provider	2.86	1.059	Some Stressor
When I am not able to provide comfort to my patient(s) and/or their significant other(s) just when they needed most	2.79	.990	Some Stressor
When I am not able to satisfy the queries related to their situation by the patient(s) and/or significant other(s)	3.06	1.047	Moderately Stressor

Most of the students prefer to take a break on their vacant time during RLE to manage stress. They expressed that praying before starting their day and sleeping, as well as crying when they feel tired or burned-out from stress highly helped them intra-personally. They are less likely to take vitamins and other supplements, as well as do not have enough time for exercise as other means to manage stress. In terms of interpersonal coping, most of them conveyed (1) listening attentively during hospital orientation, (2) reviewing the concepts and practice the procedures learned before reporting to duty, and (3) expressing or sharing their concerns to their families, friends, and duty-mates to be of great help to them.

3.5. *Relationship between stressors and coping strategies (both intrapersonal and interpersonal)*

As illustrated on Table 5, among all the Intrapersonal stressors only Skill Confusion has significant relationship with interdependence under Interpersonal Coping strategy, since its *p*-value of 0.000 is less than 0.01 level of significance. Furthermore, the Spearman's correlation coefficient r of -0.259 indicates a low degree of correlation. This means a significant negative relationship between Skill Confusion and Interdependence of Interpersonal coping strategy.

During student nurses' RLE, increased Skill confusion (interpersonal stressor) lead to decreased Interdependence (interpersonal coping).

Table 4. Perceived intrapersonal and interpersonal coping strategies of nursing students during RLE

Coping Strategies	Mean	SD	Interpretation
Intrapersonal			
Self-Concept	*3.75*	*1.128*	*High Coping Strategy*
Pray before starting my day and before going to sleep.	4.15	1.170	High Coping Strategy
Engage in recreational activities.	3.61	1.123	High Coping Strategy
Cry whenever I feel burned out/tired due to stress.	3.50	1.289	High Coping Strategy
Self-talking, reinforcing positive feedback.	3.71	1.008	High Coping Strategy
Self-awareness exercises and over-come my weaknesses by means of meditation.	3.80	1.049	High Coping Strategy
Physiological	*3.39*	*1.219*	*Moderate Coping Strategy*
Sleep adequately and take nap(s) daily	3.58	1.107	High Coping Strategy
Take a break during my vacant time	3.89	1.028	High Coping Strategy
Eat my meals three times a day and eat snacks	3.59	1.228	High Coping Strategy
Take vitamin supplements every day	2.95	1.348	Moderate Coping Strategy
Do exercise at least 30 minutes a day	2.94	1.386	Moderate Coping Strategy
Interpersonal			
Role Function	*4.13*	*0.855*	*High Coping Strategy*
Collaborate with my duty mates and refer endorsements accordingly.	4.19	.917	High Coping Strategy
Listen attentively during hospital orientation.	4.42	.734	Very High Coping Strategy
Review the concepts and practice the procedures learned Before reporting duty.	3.97	.900	High Coping Strategy
Formulate a plan of care for my patient and anticipate any possible events during my care.	3.99	.888	High Coping Strategy
Evaluate patient's condition after the nursing interventions and medication administration	4.07	.834	High Coping Strategy
Interdependence	*3.46*	*1.230*	*High Coping Strategy*
Express/ share my concerns to my duty mates	3.66	1.038	High Coping Strategy
Express/ share my concerns to my Clinical Instructor	3.30	1.290	Moderate Coping Strategy
Express/ share my concerns to the staff nurses	2.92	1.427	Moderate Coping Strategy
Express/ share my concerns to my friends	3.71	1.154	High Coping Strategy
Express/share my concerns to my family	3.72	1.241	High Coping Strategy

Table 5 also summarizes the Spearman's Correlation test results between Interpersonal Stressors' variables on Staff Nurses, Duty-Mates, Clinical Instructor and Patients and Significant others, and the respondents' identified Coping Strategies. The results portray that in all the factors under interpersonal stressor, Staff Nurses has a significant relationship with Self-Concept (intrapersonal coping); with r=0.152 and *p*=.035 tested at 0.05 confidence level. This implies a weak positive correlation between staff nurses and self-concept.

Also, Duty-mates with r=0.160 and *p*=0.027 tested at 0.05 confidence level and Clinical Instructor with r=-0.237 and *p*=0.001 tested at 0.01 confidence level, were both significantly correlated with Physiological coping strategy (intrapersonal). This indicates that Duty-mates, an interpersonal stressor, is positively correlated to Physiological coping strategy, an intrapersonal coping, while, the interpersonal stressor, Clinical Instructor, has a negative relationship with Physiological coping strategy of nursing students.

Clinical Instructor also has a significant moderate negative correlation with Interdependence, an interpersonal coping, with r=-0.317 and *p*=.000 tested at 0.01 confidence level, as perceived by the respondents during their RLE duty in the hospitals.

Table 5. Relationship between stressors and coping strategies (both intrapersonal and interpersonal)

Stressors		Coping Strategies			
		Self-Concept	Physiological	Role Function	Interdependence
Intrapersonal					
Knowledge Insufficiency	Correlation Coefficient	-.108	.084	-.083	-.127
	Sig. (2-tailed)	.136	.246	.255	.081
Fear of Clinical Area	Correlation Coefficient	-.037	.012	-.071	-.134
	Sig. (2-tailed)	.607	.872	.328	.064
Skill Confusion	Correlation Coefficient	-.070	-.007	-.110	-.259
	Sig. (2-tailed)	.339	.927	.130	.000*
Interpersonal					
Staff Nurses	Correlation Coefficient	.152	.016	-.070	-.015
	Sig. (2-tailed)	.035**	.826	.334	.832
Duty-Mates	Correlation Coefficient	-.030	.160	-.077	-.110
	Sig. (2-tailed)	.679	.027**	.290	.128
Clinical Instructor	Correlation Coefficient	.074	-.237	-.055	-.317
	Sig. (2-tailed)	.312	.001*	.450	.000*
Patients and Significant Others	Correlation Coefficient	.023	-.027	-.108	-.117
	Sig. (2-tailed)	.757	.712	.136	.106

*Correlation is significant at the 0.01 level (2-tailed).
**Correlation is significant at the 0.05 level (2-tailed).

4. Discussion

This study aimed to investigate the stressors and coping strategies that nursing students commonly used in managing stress and their relationship to each other. It has been portrayed that all the identified intrapersonal and interpersonal stressors were perceived to be "some stressor" by the respondents, except for the interpersonal stressor Clinical Instructor, which is perceived to be "moderately stressor". This implies that this interpersonal stressor caused more stress than all the other stressors identified by nursing students. Similar findings of Shdaifat et al. (2018) point out that nursing students experience a moderate level of stress because of their teacher and nursing staff, peers, daily life, and taking care of patients. Moreover, a study in the Arab American University yielded the same results that identify teachers and nursing staff as the main stressors of nursing students in their first clinical training (Toqan et al., 2023). A phenomenological study among Malawian nursing students revealed that a lecturer who interacts in a "policing manner" induces more stress (Msiska et al., 2019). These students shared that the intimidating and unfriendly way of supervising them arouses stress, which causes them to commit mistakes more. They feel threatened whenever their teacher approach them and starts asking questions or shouts at them when doing procedures or committing errors. Because of the way their lecturers approach them, they feel nervous and avoids them. This poor lecturer-student relationship affects the clinical experience and learning of the students (Msiska et al., 2019). Students who experienced stress in the practice settings because of their teachers felt embarrassed, belittled, and stupid (Al-Qerem et al., 2021).

The instructor's role in assisting student nurses to reach professional excellence is very important. In the same study conducted at Shiraz University of Medical Sciences (Shiraz, Iran) most of the students had the perception that their instructors have a more evaluative role than a teaching role. The clinical instructor or mentors can play an important role in student nurses' self-confidence, promote role socialization, and encourage independence which leads to clinical competency. A supportive and socializing role was identified by the students as the recommended function of a mentor. Nursing faculties can also help meet student needs by acknowledging their complaints of heavy workloads and extra assignments, offering supportive services. The results of this study highlight the necessity of building a more connected, healthy, and positive teacher-learner relationship especially in the clinical setting. This entails the need for continuing professional education among educators that enhances their relational competence as well as effective supervision of students in the clinical practice setting (Msiska et al., 2019).

As to the utilization of coping strategies, results revealed a "High Coping Strategy" utilization of both the intrapersonal and interpersonal strategies, except for Physiological, an intrapersonal coping strategy. According to Roy (2009), Physiological coping strategy pertains to the way a person responds as a physical being to the stimuli from the environment. The goal of this coping strategy is primarily geared towards physiological integrity. It basically means that one must attend to his physical bodily needs to establish individual coping against stressors. Students may be able to benefit from this coping strategy through activities that facilitate proper physiological functioning such as eating healthy foods and instituting adequate rest and sleep patterns. Similar results were observed in the study of Toqan et al. (2023), that revealed a combination of problem-solving and avoidance, both of which are interpersonal, as well as optimism which is an intrapersonal coping strategy were occasionally utilized by students to manage stressors. While transference behaviors like feasting a deep sleep, relaxing by watching TV, taking a shower, exercise, etc. have low impact on their stressors. However, a study among nursing students in Najran University in Saudi Arabia yielded a contradicting result such that transference or shifting stress to leisure activities like sleeping, listening to music, watching movies, or sports was the most frequently employed coping strategy (Aedh et al., 2015).

Furthermore, among all the coping strategies identified in this study, role function was found to be utilized the most. It is defined by Roy (2009) as the primary, secondary, or tertiary roles that a person performs in the society. Being aware of one's role enables an individual to accomplish tasks effectively. Students establish role function coping by being thoroughly competent in their role as a care provider. Attentively listening to nursing endorsements, participating in hospital orientations, reviewing concepts and procedures before going to duties, and the like increase student's sense of preparedness and confidence to attend clinical duties and do their role as care giver. Bodys-Cupak et al. (2016) affirms that students feel less stressed when they are more confident and better prepared to perform procedures to their patients. Several studies (Ab Latif & Nor, 2019; Baluwa et al., 2021; Nebhinani et al., 2020) yield somewhat similar results that active coping skills and planning are the commonly used coping strategies among nursing students. A qualitative study also claims that actively confronting stressful situations by developing one's professional competence, reflection, observation, and learning from the experience of others, and previous mistakes helped them control stress (Rafati et al., 2017).

It was also disclosed in this study that among all the Intrapersonal stressors, Skill confusion has significant inverse relationship with interdependence under Interpersonal Coping strategy. Skill confusion can be rooted down from the lack of knowledge and professional abilities coupled with the responsibilities of patient care. A study in Saudi Arabia expressed that the lack of knowledge and skill proficiency is perceived to be the topmost stressor by students. This happens when they are not familiar with the medical terms, patient history, diagnosis, and treatment regimen (Aedh et al., 2015). The students experience more stress when they lack confidence and do not feel ready or prepared to perform a procedure towards their patients (Bodys-Cupak et al., 2016). Interdependence as defined by Callista Roy (2009), pertains to the coping strategy from forming close relationship to foster collaboration and coordination.

The results of this study imply that in the clinical setting, when the student nurse has increased stress from Skill confusion (interpersonal stressor) it can lead to decreased utilization of Interdependence (interpersonal coping). This means that when students are stressed due to poor performance during RLE, wrong intervention, or was not able to prioritize and implement nursing care plans accordingly, they work and talk less with others. On another note, when the Interdependence coping strategy is increased, it promotes collaboration and therefore decreases the Skill confusion as a stressor. This means that they collaborate and talk more with their others, their duty-mates, and assigned clinical instructor when students perform well and are less stressed. A longitudinal study among nursing students in Hong Kong shared similar findings. The lack of knowledge and lost confidence causes them frustrations, self-doubt, and heightened anxiety. The overwhelming stress from the clinical placement keeps them from working effectively with their peers. This often caused them to struggle in keeping up with their fellow duty-mates (Cheng et al., 2023). However, these are contrary to the results of a cross-sectional study in Kelantan, Malaysia which found significant positive correlation of "stress from lack of professional knowledge and skills and ward staff" with emotional and instrumental supports as coping (Ab Latif & Nor, 2019). The contrasting results could be attributed to the differing demographics of the sample of this study and that of the study in Malaysia. Moreover, the instruments and methodologies used in the two studies were also different. This could be explored more on further studies.

Also, in all the factors under interpersonal stressor, Staff Nurses has a positive significant relationship with students' Self-Concept under intrapersonal coping. When the nursing student has a higher self-concept, it can be said that he or she will be likely to perform better; as he or she perceives himself or herself as a person who is able to provide quality care to the patients in the hospital and able to perform certain procedures and tasks (Duraku & Hoxha, 2018). Additionally, when the staff nurses have higher confidence on students performing procedures on patient care, this causes decreased stress on students. Decreased stress implies a lesser need for the self-concept coping strategy, since the students will be able to carry out responsibilities given to them by the staff nurses without fear or anxiety. The results somehow correspond with the study of Grobecker (2016), that claims that good relationships with the healthcare team, especially the staff nurses, and students' sense of belongingness in the clinical environment positively impacts students' self-concept, motivation, confidence, leading to a maximized learning. On the other hand, an unwelcoming or intimidating practice setting caused by an unapproachable, ignoring nursing staff can decrease students' sense of belongingness. This is strongly associated with increased distress among nursing students (Admi et al., 2018; Labrague et al., 2017; McCloughen et al., 2020).

Staff nurses are an integral piece of the nursing students' education process. Due to the nursing shortage, fewer staff is available to assist in the educational process. Faculty depends on staff nurses to assist them in clinical education of nursing students and often staff nurses are not given any direction on how to provide this assistance to both faculty and nursing students (Gorton, & Foss, 2017). Establishing proper communication to staff nurses aids the student nurses to perform properly in rendering care to the patient. The result of this study is somewhat in congruence with the study of Ismaile (2017), as well as the study of Al-Zayyat & Al-Gamal (2014), that staff nurses cause high level of stress among undergraduate student nurses during their clinical exposures. The lack of support and uncooperative nursing staff are the commonly identified great source of stress among the student nurses. They highlighted the need to employ appropriate strategies to improve this student-staff nurse relationship such as improving clear communication between the nursing school and affiliated hospital on students' preceptorship programs especially before the start of the students' exposure, as well as an integral part of the clinical instructors in the process.

As to the duty-mates stressor and physiological coping strategy having a positive significant relationship, when the stressor, duty mates, is increased, there will be a higher need for the physiologic coping strategies. For the student nurse to combat the stress brought about by their duty mates, the student nurses usually attend to his or her physical bodily needs. This facilitates proper physiological functioning; by this the student nurses can perform their duties well, with the ample hours of rest, balanced diet, and exercise. A healthy student nurse can provide their competent skills during their duties. The results of this study imply that an increased stressor on duty-mates necessitates an increased physiologic coping strategy. Several studies also report that problems in communication and interactions among student nurses and their groupmates during their supervised clinical or practical trainings to be a significant root of academic stress (Hirsch et al., 2018).

Lastly, the clinical instructor as a stressor has a negative significant relationship with both the physiological and interdependence coping strategies. During the clinical exposure of the student nurses, the clinical instructor has their own expectations and requirements to be complied with, therefore causes increased stress to the students on duty. In this study, the more the Clinical Instructor becomes a stressor, the lesser is the utilization of physiologic coping strategy by the student nurses. This is because the time that should be spent for eating, sleeping, taking a break and the like will be more likely spent on completing requirements and improving patient care to meet the instructor's expectations (Guro & Buenavidez, 2023).

When the interpersonal stressor, clinical instructors, causes students more stress, they utilize Interdependence coping strategy less. This means that they share concerns less with each other when they are stressed by their instructor. When the instructor's approach or expectation/s cause them stress or pressure, it can lead them to focus their full attention on their individual patients to meet deadlines and these expectations. When the stress brought upon by the Clinical Instructor increases, the team dynamics is also affected as well as the ability of the group to perform their nursing responsibilities efficiently and effectively as a team (Delawala, 2020). Various studies affirm these results such that over dedication to academic studies and inefficient management of stress adversely affect their quality of life, social and family relationships (Quah, 2014). It also harmfully impacts the student nurses' sleep, mood, affinity, and ability to perform some physical exercise, their over-all physiological and mental health (Hirsch et al., 2018). Ismaile (2017) also attributes the stress brought about by their teachers to unclear or undefined expectations from both sides. Setting of clear learning objectives and outcomes for each clinical duties will help resolve and prevent instructors from having unrealistic and unconstructive expectations from their students.

5. Implications and limitations

The findings of this study imply the need for the nursing educators to reflect on what role and attitude they have when supervising students during their RLE, whether more of the strict, non-approachable, non-accommodating or the other way around. A balance of imposing appropriate discipline in the right tone and timing in the clinical area and the provision of the much-needed support, and a clinical environment conducive for learning will better help students manage stress during the RLE. As stress is known to have various impact on the academic performance and quality of life of the students, this result highlights the importance for the nursing administrators to consider and regularly monitor student feedback when it comes to what causes them stress. This study also has implications also for nursing administrators as well as nursing regulating bodies to review the current curriculum and consider the inclusion of programs and strategies that help students manage stress more efficiently especially in their RLE. Effective curriculum should offer students quality nursing education but should not cause them stress that could compromise their academic performance as well as over-all quality of life.

This study has limitations. It is purely descriptive and correlational; hence no direct causal relationships can be drawn from the findings. Great insights on nursing students' stressors and coping during their RLE can be derived from the study, nonetheless. Also, the instrument used was a researcher-crafted one which has only undergone content validity. Appropriate psychometric tests of construct validity should be done for it to be widely used for future studies. Lastly, although the study employed total enumeration sampling, data were gathered from only two out of three schools in Iligan City who gave consent. Upscaling the sample size could enhance generalizability.

6. Conclusion

This study concludes that stressors are inevitable and integral in nursing students' related learning experience. All intrapersonal and interpersonal stressors experienced by the nursing students rarely cause them stress except for the Clinical Instructor. The impact of Clinical instructor causes more stress to the students among all other stressors. Responding to and confronting these stressors resulted to high intrapersonal and interpersonal adaptive coping utilization among these students. The current study only describes the common stressors and coping strategies of nursing students as well as its significant relationship. Further studies on other factors such as demographic data, effectiveness of various coping techniques and existing stress management programs are recommended.

Acknowledgment

The researchers personally funded this research study. However, the authors would like to extend gratitude to all the nursing schools, administration, and students who in one way or another made contributions in the completion of the study.

Author contribution

All the authors contributed in the conceptualization, review of related literature, data collection and analysis, writing of the manuscript and approved the final output. GSR repackaged the manuscript for publication approved by the rest of the authors.

Conflict of interest

There is no conflict of interest for all the authors of this study.

References

Ab Latif, R., & Nor, M. Z. M. (2019). Stressors and coping strategies during clinical practice among diploma nursing students. *The Malaysian Journal of Medical Sciences, 26*(2), 88. https://doi.org/10.21315%2Fmjms2019.26.2.10

Admi, H., Moshe-Eilon, Y., Sharon, D., & Mann, M. (2018). Nursing students' stress and satisfaction in clinical practice along different stages: A cross-sectional study. *Nurse Education Today*, *68*, 86-92. https://doi.org/10.1016/j.nedt.2018.05.027

Aedh, A. I., Elfaki, N. K., & Mohamed, I. A. (2015). Factors associated with stress among nursing students (Najran University-Saudi Arabia). *IOSR Journal of Nursing and health Science*, *4*(6), 33-38. https://www.iosrjournals.org/iosr-jnhs/papers/vol4-issue6/Version-6/E04663338.pdf

Al-Qerem, W., Hammad, A., Amawi, H. A., Jarab, A. S., & Ling, J. (2021). Anxiety and depression among pharmacy students before and during COVID-19 pandemic. *Tropical Journal of Pharmaceutical Research*, *20*(5), 1039-1047. https://doi.org/10.4314/tjpr.v20i5.22

Al-Gamal, E., Alhosain, A., & Alsunaye, K. (2018). Stress and coping strategies among Saudi nursing students during clinical education. *Perspectives in Psychiatric Care*, *54*(2), 198-205. https://doi.org/10.1111/ppc.12223

Al-Zayyat, A. S., & Al-Gamal, E. (2014). Perceived stress and coping strategies among Jordanian nursing students during clinical practice in psychiatric/mental health courses. *International Journal of Mental Health Nursing*, *23*(4), 326-335. https://doi.org/10.1111/inm.12054

Alghamdi, S., Aljabri, S., Jafari, G., Alzebali, R., Alkunaidiri, N., & Kalantan, N. (2019). Sources of stress among undergraduate nursing students. *Global Journal of Health Science*, *11*(9), 116. https://doi.org/10.5539/GJHS.V11N9P116

Aljohani, W., Banakhar, M., Sharif, L., Alsaggaf, F., Felemban, O., & Wright, R. (2021). Sources of stress among Saudi Arabian nursing students: A cross-sectional study. *International Journal of Environmental Research and Public Health*, *18*(22), 11958. https://doi.org/10.3390%2Fijerph182211958

Alvarez, H. A. O., Provencio-Vasquez, E., Slavich, G. M., Laurent, J. G. C., Browning, M., McKee-Lopez, G., Robbins, L., & Spengler, J. D. (2019). Stress and health in nursing students: The nurse engagement and wellness study. *Nursing Research*, *68*(6), 453-463. https://doi.org/10.1097%2FNNR.0000000000000383

Baluwa, M. A., Lazaro, M., Mhango, L., & Msiska, G. (2021). Stress and coping strategies among Malawian undergraduate nursing students. *Advances in Medical Education and Practice, 12,* 47-556. https://doi.org/10.2147/AMEP.S300457

Bam, V. B., Oppong, G. A., & Ibitoye, M. B. (2014). Stress and coping mechanisms of nursing students during clinical practice in Ghana. *Journal of Science and Technology (Ghana)*, *34*(2), 50-59. https://doi.org/10.4314/just.v34i2.6

Bodys-Cupak, I., Majda, A., Zalewska-Puchała, J., & Kamińska, A. (2016). The impact of a sense of self-efficacy on the level of stress and the ways of coping with difficult situations in Polish nursing students. *Nurse Education Today*, *45,* 102-107. https://doi.org/10.1016/j.nedt.2016.07.004

Chaabane, S., Chaabna, K., Bhagat, S., Abraham, A., Doraiswamy, S., Mamtani, R., & Cheema, S. (2021). Perceived stress, stressors, and coping strategies among nursing students in the Middle East and North Africa: An overview of systematic reviews. *Systematic Reviews*, *10*(1), 136. https://doi.org/10.1186/s13643-021-01691-9

Cheng, W. L. S., Chow, P. P. K., & Wong, F. M. F. (2023). Associations among stressors, perceived stress, and psychological distress in nursing students: A mixed methods longitudinal study of a Hong Kong sample. *Frontiers in Psychology*, *14*, 1234354. https://doi.org/10.3389/fpsyg.2023.1234354

Ching, S. S. Y., Cheung, K., Hegney, D., & Rees, C. S. (2020). Stressors and coping of nursing students in clinical placement: A qualitative study contextualizing their resilience and burnout. *Nurse Education in Practice*, *42*, 102690. https://doi.org/10.1016/j.nepr.2019.102690

Commission on Higher Education. (2009). *CHED Memorandum Order (CMO) No. 14, Series of 2019: Policies and standards for Bachelor of Science in Nursing (BSN) program.* https://ched.gov.ph/wp-content/uploads/2017/10/CMO-No.14-s2009.pdf

Delawala, F. (2020). *The relationship between stress and teamwork during interprofessional collaboration: An integrative literature review* [Doctoral dissertation, North-West University]. Boloka Institutional Repository. https://repository.nwu.ac.za/handle/10394/34988

Duraku, Z. H., & Hoxha, L. (2018). Self-esteem, study skills, self-concept, social support, psychological distress, and coping mechanism effects on test anxiety and academic performance. *Health Psychology Open, 5*(2), 2055102918799963. https://doi.org/10.1177/2055102918799963

Durgun Ozan, Y., Duman, M., Çiçek, Ö., & Baksi, A. (2020). The effects of clinical education program based on Watson's theory of human caring on coping and anxiety levels of nursing students: A randomized control trial. *Perspectives in Psychiatric Care*, *56*(3). https://doi.org/10.1111/ppc.12477

El Ansari, W., Adetunji, H., & Oskrochi, R. (2014). Food and mental health: Relationship between food and perceived stress and depressive symptoms among university students in the United Kingdom. *Central European Journal of Public Health*, *22*(2), 90-97. https://doi.org/10.21101/cejph.a3941

Fink, G. (2016). Stress, definitions, mechanisms, and effects outlined: Lessons from anxiety. In G. Fink (Ed.), *Stress: Concepts, cognition, emotion, and* behavior (pp. 3–11). Academic Press. https://doi.org/10.1016/B978-0-12-800951-2.00001-7

Gorton, K. L., & Foss, K. (2017). Partnerships with clinical settings: Roles and responsibilities of nurse educators. In M. H. Oermann, J. C. De Gagne, & B. C. Phillips (2nd Ed.), *Teaching in Nursing and Role of the Educator: The Complete Guide to Best Practice in Teaching, Evaluation, and Curriculum Development* (pp. 203-230). Springer Publishing Company.

Grobecker, P. A. (2016). A sense of belonging and perceived stress among baccalaureate nursing students in clinical placements. *Nurse Education Today*, *36*, 178-183. https://doi.org/10.1016/j.nedt.2015.09.015

Guro, N. M., & Buenavidez, E. B. (2023). Sleep deprivation, clinical exposure anxiety, and psycho-emotional state of nursing students. *International Journal of Social Science and Human Research, 6*(11), 7052-7060. http://dx.doi.org/10.47191/ijsshr/v6-i11-66

Hershner, S. D., & Chervin, R. D. (2014). Causes and consequences of sleepiness among college students. *Nature and Science of Sleep, 6,* 73-84. https://doi.org/10.2147/NSS.S62907

Hindustan Times. (2023, March 16). *Academic stress among causes of suicides at top institutes like IIT: Centre. Hindustan Times.* https://www.hindustantimes.com/india-news/dwarka-expressway-pm-modi-inaugurates-haryana-stretch-how-will-it-help-101710132848972.html

Hirsch, C. D., Barlem, E. L. D., Almeida, L. K. D., Tomaschewski-Barlem, J. G., Lunardi, V. L., & Ramos, A. M. (2018). Stress triggers in the educational environment from the perspective of nursing students. *Texto & Contexto-Enfermagem*, *27*, e0370014. https://doi.org/10.1590/0104-07072018000370014

Hutmacher, F. (2021). Putting stress in historical context: Why it is important that being stressed out was not a way to be a person 2,000 years ago. *Frontiers in Psychology*, *12*, 539799. https://doi.org/10.3389/fpsyg.2021.539799

Ismaile, S. (2017). Perceived clinical stressors among Saudi nursing students. *Open Journal of Nursing, 7*(4), 463. https://doi.org/10.4236/ojn.2017.74036

Khan, N., & Alam, B. (2015). Views of nursing students about clinical instructor behaviours that affect the development of self-confidence, peshawar, KP, Pakistan. *International Journal of Innovative Research and Development,* *4*(4), 10-20.

https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=4cf33a21db522c71839bc534b3ca55f0f1d3006c

Labrague, L. J. (2021). Resilience as a mediator in the relationship between stress-associated with the Covid-19 pandemic, life satisfaction, and psychological well-being in student nurses: A cross-sectional study. *Nurse Education in Practice, 56,* 103182. https://doi.org/10.1016/j.nepr.2021.103182

Labrague, L. J. (2022). Specific coping styles and its relationship with psychological distress, anxiety, mental health, and psychological well-being among student nurses during the second wave of the COVID-19 pandemic. *Perspectives in Psychiatric Care, 58*(4), 2707-2714. https://doi.org/10.1111/ppc.13111

Labrague, L. J., McEnroe-Petitte, D. M., Gloe, D., Thomas, L., Papathanasiou, I. V., & Tsaras, K. (2017). A literature review on stress and coping strategies in nursing students. *Journal of Mental Health, 26*(5), 471-480. https://doi.org/10.1080/09638237.2016.1244721

Labrague, L. J., McEnroe-Petitte, D. M., Papathanasiou, I. V., Edet, O. B., Tsaras, K., Leocadio, M. C., Colet, P., Kleisiaris, C. F., Fradelos, E. C., Rosales, R. A., Santos-Lucas, K. V., & Velacaria, P. I. T. (2018). Stress and coping strategies among nursing students: An international study. *Journal of Mental Health, 27*(5), 402-408. https://doi.org/10.1080/09638237.2017.1417552

Lavoie-Tremblay, M., Sanzone, L., Aubé, T., & Paquet, M. (2022). Sources of stress and coping strategies among undergraduate nursing students across all years. *Canadian Journal of Nursing Research, 54*(3), 261-271. https://doi.org/10.1177%2F08445621211028076

Mahomed, N. J. B., Johari, K. S. K., & Mahmud, M. I. (2019). Coping strategies and psychological well-being of guidance and counselling teachers in schools. *Creative Education, 10*(12), 3028. http://www.scirp.org/journal/Paperabs.aspx?PaperID=96791

McCarthy, B., Trace, A., O'Donovan, M., Brady-Nevin, C., Murphy, M., O'Shea, M., & O'Regan, P. (2018). Nursing and midwifery students' stress and coping during their undergraduate education programmes: An integrative review. *Nurse Education Today, 61*, 197-209. https://doi.org/10.1016/j.nedt.2017.11.029

McCloughen, A., Levy, D., Johnson, A., Nguyen, H., & McKenzie, H. (2020). Nursing students' socialisation to emotion management during early clinical placement experiences: A qualitative study. *Journal of Clinical Nursing, 29*(13-14), 2508-2520. https://doi.org/10.1111/jocn.15270

McEwen, M., & Wills, E. (2019). *Theoretical basis for nursing* (5th ed.). Lippincott Williams & Wilkins.

Milton-Wildey, K., Kenny, P., Parmenter, G., & Hall, J. (2014). Educational preparation for clinical nursing: The satisfaction of students and new graduates from two Australian universities. *Nurse Education Today, 34*(4), 648-654. https://doi.org/10.1016/j.nedt.2013.07.004

Mindanao State University-Iligan Institute of Technology Clinic. (2018). *First Semester of Academic Year 2018-2019 Report.*

Monteiro, N. M., Balogun, S. K., & Oratile, K. N. (2014). Managing stress: the influence of gender, age and emotion regulation on coping among university students in Botswana. *International Journal of Adolescence and Youth, 19*(2), 153-173. https://doi.org/10.1080/02673843.2014.908784

Msiska, G., Kamanga, M., Chilemba, E., Msosa, A., & Munkhondya, T. E. (2019). Sources of stress among undergraduate nursing students during clinical practice: A Malawian perspective. *Open Journal of Nursing, 9*(01), 1. https://doi.org/10.4236/ojn.2019.91001

Munawar, S., Hussain, M., Afzal, M., & Gilani, S. A. (2019). Nursing students' perceptions of clinical instructor behaviors that affect the development of self-confidence. *European Academic Research, 7*(3), 1817-1832. https://euacademic.org/UploadArticle/4026.pdf

Nebhinani, M., Kumar, A., Parihar, A., & Rani, R. (2020). Stress and coping strategies among undergraduate nursing students: A descriptive assessment from Western Rajasthan. *Indian Journal of Community Medicine, 45*(2), 172-175. https://doi.org/10.4103%2Fijcm.IJCM_231_19

O'Connor, D. B., Gartland, N., & O'Connor, R. C. (2020). Stress, cortisol and suicide risk. *International Review of Neurobiology, 152,* 101-130. https://doi.org/10.1016/bs.irn.2019.11.006

Polit, D., & Beck, C. (2022). *Essentials of Nursing Research* (10th ed.). Lippincott Williams & Wilkins.

Quah, S. (2014). Caring for persons with schizophrenia at home: Examining the link between family caregivers' role distress and quality of life. *Sociology of Health & Illness, 36*(4), 596-612. https://doi.org/10.1111/1467-9566.12091

Rafati, F., Nouhi, E., Sabzevari, S., & Dehghan-Nayeri, N. (2017). Coping strategies of nursing students for dealing with stress in clinical setting: A qualitative study. *Electronic Physician, 9*(12), 6120. https://doi.org/10.19082%2F6120

Rayan, A. (2019). Mindfulness, self-efficacy, and stress among final-year nursing students. *Journal of Psychosocial Nursing and Mental Health Services, 57*(4), 49-55. https://doi.org/10.3928/02793695-20181031-01

Ribeiro, Í. J., Pereira, R., Freire, I. V., de Oliveira, B. G., Casotti, C. A., & Boery, E. N. (2018). Stress and quality of life among university students: A systematic literature review. *Health Professions Education, 4*(2), 70-77. https://doi.org/10.1016/j.hpe.2017.03.002

Roy, C. (2009). *The Roy adaptation model.* (3rd ed.). Upper Saddle River New Jersey, Pearson Education.

Shdaifat, E., Jamama, A., & AlAmer, M. (2018). Stress and coping strategies among nursing students. *Global Journal of Health Science, 10*(5), 33-41. https://doi.org/10.5539/gjhs.v10n5p33

Stewart, J. G., Shields, G. S., Esposito, E. C., Cosby, E. A., Allen, N. B., Slavich, G. M., & Auerbach, R. P. (2019). Life stress and suicide in adolescents. *Journal of Abnormal Child Psychology, 47,* 1707-1722. https://doi.org/10.1007/s10802-019-00534-5

Tharani, A., Husain, Y., & Warwick, I. (2017). Learning environment and emotional well-being: A qualitative study of undergraduate nursing students. *Nurse Education Today, 59*, 82-87. https://doi.org/10.1016/j.nedt.2017.09.008

Thomas, C. M., McIntosh, C. E., Lamar, R. A., & Allen, R. L. (2017). Sleep deprivation in nursing students: The negative impact for quality and safety. *Journal of Nursing Education and Practice, 7*(5), 87. http://dx.doi.org/10.5430/jnep.v7n5p87

Toqan, D., Ayed, A., Malak, M. Z., Hammad, B. M., ALBashtawy, M., Hayek, M., & Thultheen, I. (2023). Sources of stress and coping behaviors among nursing students throughout their first clinical training. *SAGE Open Nursing, 9*, 23779608231207274. https://doi.org/10.1177/23779608231207274

World Health Organization. (2023, August 28). *Suicide.* https://www.who.int/news-room/fact-sheets/detail/suicide

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):16-28, April 2024
https://doi.org/10.14710/ 10.14710/nmjn.v14i1.53942

ORIGINAL RESEARCH

Nursing Students' Perceptions about the Effects of Climate Change on Health: A Descriptive Exploratory Study

Jonalyn P. Santos[1], Eladio Martin S. Gumabay[2]

[1]*Center for Health Research and Development, University of Saint Louis, Tuguegararo City, Philippines*
[2]*Community Health Nursing Department, College of Nursing, Taibah University, Medinah, Kingdom of Saudi Arabia*

Article Info

Article History:
Received: 26 April 2023
Revised: 26 March 2024
Accepted: 5 April 2024
Online: 30 April 2024

Keywords:
Climate change; climate change effects; nursing students; perceptions

Corresponding Author:
Jonalyn P. Santos
Center for Health Research and Development, University of Saint Louis, Tuguegararo City, Philippines
Email: jongpsantos@gmail.com; jonalynsantos@usl.edu.ph

Abstract

Background: Climate change is recognized as an important health concern that the health sector and nurses must prepare for. Adequate preparation and understanding of its effects on health must be exemplified by nurses and nursing students. Previous studies showed that nurses and nursing students have good knowledge of climate change and its effects on health. However, none of these studies were conducted in the Philippines.
Purpose: This study explored the perceptions of nursing students about the effects of climate change on health.
Methods: The researchers utilized a descriptive qualitative research design. The study was conducted among level three Bachelor of Science in Nursing students selected through purposive sampling using the following criteria: a) students who were enrolled with a full load of units in the BSN course, and b) those who have not taken Disaster Nursing course in the previous semesters. A total of 35 participants were included in the study. Data collection was done through an interview using a researcher-made interview guide. Data analysis was done through content analysis.
Results: Two major themes were identified, which describe the perceptions of the nursing students about the effects of climate change on health. The findings revealed that the respondents have an adequate understanding of what climate change is and the factors that cause it. The respondents also mentioned that climate change negatively affects the physiological health of humans. Specifically, climate change increases the risk for non-communicable disease such as cardiovascular and respiratory diseases. It also alters certain characteristics of communicable diseases such as prevalence, seasonal pattern, and geographic distribution.
Conclusion: The findings revealed that student nurses know what climate change is and are aware that it negatively affects health. However, their perceptions of the effects of climate change on health are limited to its physiologic effects, specifically on non-communicable and infectious disease, as this reflects their understanding of how environmental factors affect disease pathogenesis or development.

How to cite: Santos, J. P., & Gumabay, E. M. S. (2024). Nursing students' perceptions about the effects of climate change on health: A descriptive exploratory study. *Nurse Media Journal of Nursing, 14*(1), 16-28. https://doi.org/10.14710/nmjn.v14i1.53942

1. Introduction

Climate change is any long-term, measurable change in climate, which includes global warming and results from either natural or man-made events (National Aeronautics and Space Administration, 2015). Climate change has been found to negatively affect health both directly and indirectly (Butler, 2018; Dupraz & Burnand, 2021; Weilnhammer et al., 2021). Studies describe the variations in the climate that directly affect health as extreme weather events, which include heat waves, torrential rains that lead to flooding, droughts, storms and cyclones, and wildfires (Butler, 2018; Harper et al., 2015; Sun et al., 2022; Weilnhammer et al., 2021). The health effects linked with extreme weather events include: 1) thermal stress, which increase the mortality of vulnerable individuals especially the elderly; 2) floods which cause traumatic injuries, exposure to toxic substances, and possible death; 3) increased incidence of communicable diseases such as diarrheal diseases, vector-borne diseases, and respiratory infections; 4) airborne allergies from polluted air ; 5) malnutrition resulting from changes in crop yields; 6) mental stress and behavior problems; and 7) complications from chronic pathologic conditions (Opoku et al., 2021; Sun et al., 2022; Weilnhammer et al., 2021).

The World Health Organization [WHO] (2021) stated that climate change threatens to cause the emergence of new diseases and increases the occurrence of prevailing diseases in humans. WHO (2021) also reported the prevalence of malnutrition as a result of poor quality and quantity of crop production and flooding. Indirect effects of climate change include a decrease in the quality and supply of potable water, food insecurity, social disruption, and population displacement (Butler, 2018; Crowley & Health and Public Policy Committee of the American College of Physicians [HPPC/ACP], 2016; Weilnhammer et al., 2021). Climate change is cited as one of the environmental risk factors to disability-adjusted life year (DALY), which is a measure of disease burden or the number of years lost to a disease (WHO, 2021). Due to the many adverse effects of climate change on human health, it is regarded as one of the most important health threats in the contemporary time and must be addressed also as a health problem and not merely an environmental issue (Butler, 2018; Hathaway & Maibach, 2018; Weilnhammer et al., 2021). This, therefore, means that health professionals have an active role in mitigating or preventing the negative effects of climate change on health (Anåker et al., 2015; Dupraz & Burnand, 2021).

The effects of climate change on health are felt worldwide but may differ across populations and geographical locations (Cianconi et al., 2020; Rocque et al., 2021). Moreover, there are a multitude of factors that can determine the extent of the effects of climate change on human health. Vulnerable groups that are at a higher risk are the elderly, children, pregnant women, those with underlying conditions, those with low socioeconomic status, outdoor workers, people living in certain geographical locations, and certain cultural-traditional groups (Ebi et al., 2021; Harper et al., 2015; Kreslake et al., 2016; McIver et al., 2016; Rocque et al., 2021). This implies a need for in-depth knowledge, understanding, and commitment, especially among allied health professionals, to effectively address climate change as an important health threat (Crowley & HPPC/ACP, 2016; Dupraz & Burnand, 2021; Hathaway & Maibach, 2018).

Knowledge and understanding of climate change and its effects on health are affected primarily by a person's educational status. People of higher educational status tend to have a better understanding of climate change and its effects (Lujala et al., 2015; Ofori et al., 2023; Siña et al., 2016). Physicians, nurses, and other allied health professionals possess a good understanding of how environmental factors affect health and well-being. This implies that allied health professionals must also have a very good grasp of the effects of climate change on health and the factors that affect an individual's vulnerability to such effects (Dupraz & Burnand, 2021; Opoku et al., 2021). Studies also found that physicians, nurses, and most allied health professionals have good knowledge about the effects of climate change on health (Anåker et al., 2015; La Torre et al., 2020; Hathaway & Maibach, 2018). However, these healthcare professionals also verbalized a desire to have a better knowledge and understanding of the effects of climate change on health, which suggests a need for enhancing education and training regarding this to better prepare for and mitigate these effects (Crowley & HPPC/ACP, 2016; Dupraz & Burnand, 2021; Hathaway & Maibach, 2018). Moreover, in-depth knowledge could be a strong factor in determining the successful implementation of appropriate interventions to combat the effects of climate change on health among target populations (Opoku et al., 2021). In spite of adequate awareness and knowledge, many misconceptions and misunderstandings have also been manifested by allied health professionals (Liao et al., 2019). Moreover, nurses do not consider climate change as a priority issue or health threat (Anåker et al., 2015).

Allied health students were found to have moderate to good level of knowledge and awareness about what climate change is and its negative effects on human health (Felicilda-Reynaldo et al., 2018; La Torre et al., 2020; Liao et al., 2019; Opoku et al., 2021; Yang et al., 2018). Nursing students were also found to be knowledgeable about climate change and that it negatively affects human health (Felicilda-Reynaldo et al., 2018; La Torre et al., 2020; Yang et al., 2018). However, nursing students have a lower level of knowledge and awareness of the effects of climate change on health compared to medical students (Liao et al., 2019). All of these studies about nursing students' perceptions on the effects of climate change on health were conducted outside the Philippines. Moreover, research on students' knowledge, awareness, and perceptions about climate change and its effects on health were limited to medical students (Domantay et al., 2021) and secondary students (Caranto & Pitpitunge, 2015). None have been conducted that focused on nursing students.

As future health professionals, it is necessary that nursing students understand and are prepared to face the threat of climate change on health. Nurses must also be responsibly involved in and support efforts for climate change mitigation and adaptation because of its many negative effects on human health (Anåker et al., 2015). Moreover, determining how students understand climate change and its effects on health is important in identifying the proper approach in providing information to this target population, especially in the locale of the study where no studies assessing the knowledge or perceptions of nursing students about the effects of climate change have been conducted. Therefore, this study aimed to explore the perceptions of nursing students about the effects of climate change on health.

2. Methods

2.1. Research design

The researchers utilized a descriptive qualitative design employing semi-structured interview for data collection. This design was chosen to have a more in-depth assessment of the student's understanding, as well as identify any misconceptions that they may have about the effects of climate change on health (Merriam & Tisdell, 2015).

2.2. Setting and participants

The study was conducted in three different universities with nursing schools in Tuguegarao City, Cagayan, Philippines. These universities are the only schools in the city offering Bachelor of Science in Nursing (BSN) program. A total of 35 respondents were included and were among the level three BSN students. Purposive sampling was used to select the respondents using the following inclusion criteria: a) students who were enrolled with a full load of units in the BSN course, and b) those who have not taken Disaster Nursing course in the previous semesters. Level 3 students were selected because they already have theoretical knowledge on major nursing concepts, such as community health and medical-surgical nursing. However, these students have not yet taken Disaster Nursing subject, wherein any interventions can be provided based on the results of the study.

Polit and Beck (2018) discuss that in a qualitative research, the occurrence of data saturation may prompt the researchers to stop the data collection process. Moreover, the use of purposive sampling also emphasizes the need for data saturation, wherein respondents are continuously included until no new information is collected (Etikan, 2016). In this study, data saturation occurred on the 28th respondent. However, the researchers added more respondents to ensure that data saturation was indeed reached.

2.3. Data collection

The researchers sought necessary approvals from the different universities included in the study before starting data collection. The researchers also coordinated with focal persons from each university in order to schedule data collection. Informed consent of the respondents were sought after discussing the nature and procedure of the research. An audio-recorded one-on-one interview was conducted using a semi-structured interview guide. The interview guide was developed by both researchers consisting of three main open-ended questions, "Tell me what comes to your mind when you hear the term climate change?", "What do you perceive are the effects of climate change on health?", and "How do you think climate change affects health?". Probing questions were also asked to follow up on the verbalizations of the respondents to the main questions, such as "Can you elaborate or give examples of these changes in the weather you consider as climate change?", "What type/s of changes in the weather affect/s cardiovascular diseases, and do these changes affect cardiovascular diseases?". The interview guide questions were evaluated by a total of three experts, one on research methods, one on environmental sciences, and one on health sciences, for their relevance to the research objectives. Researchers modified the wording of some questions based on the recommendations. The data collection was conducted from February to April 2021, which depended on the availability and convenience of the respondents. During actual data collection, the researchers asked permission from each respondent for the audio-recording of the interview session. The interviews were conducted by the researchers in a private area that was provided by the focal person from each university. Each respondent was interviewed once, which lasted between 25-35 minutes.

2.4. Data analysis

Qualitative content analysis of the respondents' verbalizations was conducted using the conventional form of content analysis, as described by Assarroudi et al. (2018). JPS performed the data analysis, while EMSG conducted member-checking at each step of the analysis process. The analysis followed several steps outlined below. Firstly, all verbalizations were transcribed into textual format to facilitate data analysis; after which, the transcribed texts were thoroughly read and re-read to identify the underlying meanings. Next, the impressions of these meanings were noted, and the text was further broken down into smaller units that captured the essence of the entire verbalization. Subsequently, these meaning units were condensed, and labels or codes were assigned to represent each unit. Finally, the coded units were sorted into categories, which were then clustered to form different themes. An illustrative sample of the verbalizations, meaning units, codes, categories, and themes is provided in Table 1.

Table 1. Sample codes, categories, and themes generated in the study

Verbalizations	Units/ Codes	Categories	Theme
P104: Climate change refers to the changes in weather and temperature P201: Climate change is a unusual weather condition that we're experiencing	Changes in normal weather pattern (Understanding)	Consistent with definition of climate change	Nursing students' understanding of climate change
P108: Climate change is when there is a big difference in normal climate patterns over a long amount of time. P205: It is change in a region with particular weather pattern or conditions, a change in the average course or condition of the weather at a place usually over a period of years	Change in weather over time (Understanding)	Consistent with definition of climate change	
P102: Different factors that contribute to the change in our climate are: factories, increase in number of vehicles, burning of plastic, deforestation, smoking P107: The contributors of climate change are greenhouse gases, aerosols in the atmosphere, major change in land use, deforestation and other human activities such as burning of fossil fuels and change in agricultural practices	Caused by human activities (Understanding)	Consistent with definition of climate change	

2.5. Rigor/*trustworthiness*

In ensuring the rigor or trustworthiness of the data and findings of analysis, the researchers applied Lincoln and Guba's Framework of Quality Criteria [as cited in Polit & Beck (2018)]: (a) credibility or the truth-value, by making sure that the information are the actual verbalizations of the respondents; (b) dependability or the consistency, by gathering the same set of relevant information across all respondents; (c) confirmability or the neutrality, through avoiding researchers' bias by ensuring that there is objectivity of the information and that the findings were actually shaped by the respondents' lived experiences; (d) transferability, by ensuring that the results can be applied to other settings and groups of nursing students who experienced the same phenomenon on client change on health; and (e) authenticity, by presenting fairly the realities of the experiences and perceptions of the respondents. To emphasize more about confirmability, member-checking was performed by the researchers among 18 respondents to present to each of them the initial results of the analysis. During the process, the researchers emphasized that the results are aggregated and not just based on individual perceptions. The respondents affirmed; hence, there was no need to revise.

2.6. Ethical considerations

Informed consent was obtained from the respondents prior to data collection. Institutional research review and clearance were also obtained before data collection. Respondents were informed of the recording of the interview, and all recordings and transcripts of the interviews were destroyed after data analysis was completed. Respondents' names were not gathered to ensure anonymity. Respondents were assigned four character alphanumeric codes, the first character is the letter P which stands for participant/ respondent, first number denotes the school and last two numbers denote the number by which the respondent was interviewed. So P101 for example, is the first respondent to be interviewed in the first school or university. For to ensure confidentiality. Transcripts were stored in a password-protected file, which can be accessed only by the researchers. Ethics review and approval was obtained from the University Research Ethics Board of University of Saint Louis, Tuguegarao City, Philippines, with reference number 2020:001.

3. Results

3.1. Characteristics of the participants

The majority of the respondents are female, and a large percentage of the respondents are 20 years old, with an average age of 20.1 years (Table 2).

Table 2. Characteristics of the respondents

Characteristics	Mean	f	%
Gender			
Female		7	23.33
Male		23	76.67
Age (years)	20.1		
19		9	30.00
20		13	43.33
21		5	16.67
22		3	10.00

3.2. Analytical findings

Two major themes were derived from the verbalizations provided by the respondents, which described their understanding of climate change and its effects on health. These themes are: a) Nursing students' understanding of climate change; and b) Climate change negatively affects the physiological health of humans. The second theme also consists of two sub-themes, namely: a) Climate change precipitates risk for respiratory and cardiovascular disease; and b) Climate change as a modifying factor of communicable disease.

3.2.1 Theme 1: Nursing students' understanding of climate change

All the respondents described climate change as a change in the normal or usually experienced weather patterns. For example, one respondent mentioned that *climate change is an unusual weather condition that we're experiencing (P201).* Majority of the respondents also mentioned that climate change is characterized by marked increases in environmental temperature, changes in wind patterns, increases in the amount of rainfall, and faster wind velocity, which occurs over a prolonged period of time. This was described by the respondents as follows: *"climate change is when there is a big difference in normal climate patterns over a long amount of time (P108)"*, and *"a change in the average course or condition of the weather at a place usually over a period of years as exhibited by temperature, wind velocity and precipitation (P205)".* Moreover, the majority of the respondents mentioned that human activities are the major causative factor for climate change. This is mentioned by the respondents as follows:

"people's act such smoking, burning, technologies' effect such smoke coming from motors and vehicles, CFC from refrigerator and other equipment (P101)", and *"the contributors of climate change are greenhouse gases, aerosols in the atmosphere, major change in land use, deforestation and other human activities such as burning of fossil fuels and change in agricultural practices (P107)"*. The perceptions of the respondents on climate change describe its actual definition. This indicates that the nursing students have a good grasp or understanding of climate change and its causative or contributory factors.

3.2.2 Theme 2: Climate change negatively affects physiological health of humans

All the respondents are aware of and have experienced some of the effects of climate change on health. They believe that climate change affects health negatively and that it poses a risk to human health, as stated by one respondent that *"the first major health impact of climate change is the rise in rates of mortality and diseases caused by extreme weather events (P111)"*. Moreover, the previous statement highlights that the effects of climate change on health are a result of extreme weather events, as verbalized by the following respondents: *"the different effects of climate change to us humans are drought which causes scarcity of food and water, unusual weather, death of animals due to inability to adapt, wildfire, diseases to humans, hurricanes (P102)"*, and *"climate change will affect people and the environment in many ways. Some of these, like stronger hurricanes and severe heat waves could be life threatening (P109)"*. Despite the consensus among the respondents of the negative effects of climate change on health, most of the respondents merely mentioned negative effects on the physiologic health of humans. However, it is important to note that a few respondents also mentioned the effect of climate change on animals, as one respondent mentioned, *"my dog once had a heat stroke because there was no current, the extreme heat really took a toll on him causing him to have a heat stroke (P206)"*, and in agriculture and economy, as verbalized by one respondent *"extremes in droughts and flooding will affect fresh water which can mean less agriculture, food and income (P306)*". The effect of climate change on the physiologic health of humans is further summarized into two sub-themes as follows:

3.2.1.1 Subtheme 1: Climate change precipitates risk for respiratory and cardiovascular disease

Majority of the respondents mentioned that climate change effects on non-communicable diseases are the most commonly experienced or observed. The respondents also verbalized that climate change increases the risk for morbidity and mortality of certain population groups for non-communicable diseases, especially of the cardiovascular and respiratory systems, as mentioned in the statement: *"climate change contributes directly to deaths from cardiovascular and respiratory diseases, particularly among elderly people (P107)"*. They explained that unpredictable changes in weather patterns cause unnecessary stress in the body and increase the risk of developing these diseases, as mentioned in this statement: *"maybe the effect of this to our health is not good in the sense that you are prone to diseases (P203)"*. The respondents also ascribed the increase in respiratory disease morbidity and mortality to sudden changes in weather and a constant increase in the quantity of air pollutants. According to the respondents, sudden, unpredictable changes in environmental temperature and the presence of air pollution due to climate change can increase a person's risk of developing certain respiratory diseases like asthma or Chronic Obstructive Respiratory Disease (COPD). This is mentioned by one respondent as follows: *"as I cited that pollution is the greatest problem that contribute to climate change the effects of this is maybe it may precipitate to lung diseases (P303)"*.

Similarly, the respondents believe that cardiovascular disease morbidity and mortality due to climate change result from an increase in environmental temperature or heat waves. According to the respondents, excessive environmental heat can aggravate symptoms of cardiovascular disease like chest pain and fatigue and may cause certain conditions like heat stroke, especially among the elderly, as mentioned in the following statement: *"the changes of earth's temperature may be brought by the increase number of cardiovascular diseases, respiratory diseases (P103)"*. The respondents further asserted that climate change weakens the adaptive capacities of humans, increasing their susceptibility to the diseases mentioned above, as expressed in the following statement: *"the effect of climate change on human health are your immune system will become weak (P205)"*. The most vulnerable groups mentioned are the elderly and children because they have poor adaptive mechanisms to climate change events, which was mentioned in the following statement: *"climate change can exacerbate health effects or diseases specially in vulnerable populations such as children, elderly and those with asthma or cardiovascular disease (P306)"*. It is evident from the verbalizations of the respondents that they have an adequate understanding of how extreme weather events caused by climate change affect certain non-communicable diseases, particularly respiratory and cardiovascular diseases.

3.2.1.2 Subtheme 2: Climate change as a modifying factor of communicable disease

Majority of the respondents also verbalized that climate change causes changes in the characteristics of certain infectious diseases like water-borne infections (e.g., diarrheal diseases and leptospirosis), food-borne infections, and vector-borne infections (e.g., dengue fever), as expressed by the statements: *"the health effects changes in the prevalence and geographical distribution of foodborne and waterborne illnesses and other infectious diseases (P308)",* and *"if weather suddenly changes from hot to cold, sometimes it can cause diarrhea, fever and other infection (P202)"*. These changes include increase in prevalence of infectious diseases, change in geographic distribution of food-borne and waterborne infections, and as mentioned in the statements: "*the health effects include changes in the prevalence and geographical distribution of foodborne and waterborne illnesses and other infectious diseases and threats (P108)",* and *"the changes in weather may increase number of diarrhea diseases (P303)"*. Moreover, the respondents also verbalized that changes in the seasonal pattern of certain infectious diseases have occurred, as expressed by the following statement, *"the most common effect of climate change is acquiring some infections that are more common during rainy or cold seasons even when it is summertime due to change of weather like dengue or diarrhea (P102)"*. The respondents also mentioned that, similar with non-communicable diseases, vulnerability to infectious diseases also increases due to climate change, especially among vulnerable populations, as mentioned in the statement, *"geriatric people or young children are sometimes more affected because the shifting of weather makes them more prone to infections (P206)"*. From the statements of the respondents, it can be determined that the respondents have a good understanding of the effects of climate change on some communicable diseases and the mechanisms by which these effects occur.

4. Discussion

This study explored the perceptions of nursing students about the effects of climate change on health. The perceptions of the nursing students are described in two major themes: a) Nursing students' understanding of climate change; and b) Climate change negatively affects physiological health of humans.

4.1 Nursing students' understanding of climate change

The results showed that the nursing students have a good grasp or understanding of what climate is and its main causative factor. This finding is consistent with previous studies conducted abroad among nurses and other healthcare professionals (Anåker et al., 2015; Hathaway & Maibach, 2018; La Torre et al., 2020). Similarly, it corresponds with previous studies conducted among nursing students abroad, indicating adequate knowledge and understanding of climate change (Felicilda- Reynaldo et al., 2018; La Torre et al., 2020; Yang et al., 2018). Moreover, the outcome resonates with previous studies conducted in the Philippines among medical students and secondary students (Caranto & Pitpitunge, 2015; Domantay et al., 2021). This finding may indicate the adequacy of basic education related to climate change among Filipino students. The Philippine basic education includes Disaster Risk Reduction and Management (DRRM) subjects among elementary and secondary students. In this subject, DRRM education is integrated into subjects such as natural sciences, social studies, and Earth and Life Science at different grade levels, focusing on hazard awareness, disaster management principles, and community-based practices (Cabilao-Valencia et al., 2019). Therefore, a good foundation, as early as elementary level, is essential in developing a good understanding of climate change and its causative factors. The respondents' adequate grasp of climate change may also be attributable to their educational level. Knowledge of climate change and its effects on health is affected primarily by a person's educational status (Lujala et al., 2015; Ofori et al., 2023; Siña et al., 2016). It can be noted that all the participants are at the college level. Moreover, previous experience of the environmental effects of climate change also justifies the adequacy of awareness manifested by the students, as majority of the respondents verbalized having direct or indirect experiences of the environmental effects of climate change. Personal experience of the effects of climate change, either direct or indirect, is a strong determinant of awareness and knowledge (Debela et al., 2015). Adequate knowledge and understanding of climate change is associated with better awareness of personal risks related to climate change and its effects (Siña et al., 2016; Zaman, 2021). Moreover, healthcare professionals such as nurses must possess adequate understanding of climate change in order to be prepared to face the threat to health (Crowley & HPPC/ACP, 2016; Dupraz & Burnand, 2021; Hathaway & Maibach, 2018; Opoku et al., 2021) and foster responsible involvement in and support efforts for climate change mitigation and adaptation (Anåker et al., 2015; Crowley & HPPC/ACP, 2016; Dupraz & Burnand, 2021).

4.2 Climate change negatively affects physiological health of humans

The findings of this study reveal that nursing students believe that climate change negatively affects health and poses a risk to human health. This is consistent with the findings of previous studies conducted in other countries (Felicilda-Reynaldo et al., 2018; La Torre et al., 2020; Yang et al., 2018). However, studies have also identified that although healthcare professionals have adequate understanding of climate change, there is always a need to gain better understanding of how climate change affects health and that these can be areas for professional development among healthcare workers (Crowley & HPPC/ACP, 2016; Dupraz & Burnand, 2021; Hathaway & Maibach, 2018). Moreover, the inclusion of climate change concepts in the curriculum of healthcare professionals is highly encouraged to ensure adequate understanding of climate change and its effects on health (Crowley & HPPC/ACP, 2016). The nursing students' verbalizations further identified that climate change affects the physiologic dimension of human health. This is consistent with the findings of studies conducted among nursing students, which also identified physiologic health effects of climate change. These studies mentioned that health system disruptions, food security and shortage, and mental health effects are the least identified effects of climate change on health by nursing students (Felicilda-Reynaldo et al., 2018; La Torre et al., 2020; Yang et al., 2018). As such, there is a need for a better coverage of concepts relating to the effects of climate change on health in the BSN curriculum (Felicilda-Reynaldo et al., 2018). This finding contrasts with a study conducted among healthcare professionals stating that climate change effects go beyond physiologic health (Opoku et al., 2021). Climate change also affects mental and psychological health, which leads to mood and behavioral disorders, occupational health disturbances, and social and economic disruptions that affect food security and nutrition (Butler, 2018; Crowley & HPPC/ACP, 2016; Ebi et al., 2021; Opoku et al., 2021; Weilnhammer et al., 2021). Moreover, climate change also causes significant disruptions on local and international health systems (Ebi et al., 2021). The effects of climate change on health are, therefore, multi-dimensional, and as such, a comprehensive and more holistic knowledge of these effects is needed in order to fully understand how climate change affects health. It is also important that healthcare professionals not only fully understand what climate change is but also have a comprehensive understanding of its effect on health in order to effectively implement measures to mitigate or address these effects (Dupraz & Burnand, 2021; Opoku et al., 2021).

4.2.1 Climate change precipitates risk for cardiovascular and respiratory disease

The results of the study further showed that the respondents believe that climate change effects on non-communicable diseases are the most commonly experienced or observed. These include respiratory and cardiovascular diseases such as stroke, hypertension, heat stroke, asthma, and COPD. This is consistent with the studies conducted among nursing students, which stated that climate change affects diseases, especially those that are related to heat, cold, and air quality (Felicilda-Reynaldo et al., 2018; La Torre et al., 2020; Yang et al., 2018). Research findings have also confirmed that climate change affects the prevalence and occurrence of non-communicable diseases (Kreslake et al., 2016; Alcayna et al., 2016; Maxwell & Blashki, 2016). However, studies have found a difference in the effects of climate change according to geographical location, which is important in predicting these effects in order to implement effective mitigation and adaptation activities (Liao et al., 2019). In tropical and subtropical countries like the Philippines, the most commonly documented effects of climate change on health are physical injuries related to extreme weather events like flooding and typhoons (Kreslake et al., 2016; McIver et al., 2016) and consequences of the latter, which include increases in the prevalence of water-borne, food-borne, and vector-borne infections.

The respondents also mentioned that climate change increases the risk for morbidity and mortality of certain population groups for non-communicable diseases, especially of the cardiovascular and respiratory systems. This is consistent with the findings of previous studies (Crowley & HPPC/ACP, 2016; Ebi et al., 2021; Opoku et al., 2021). This increase in respiratory disease morbidity and mortality is due to sudden changes in weather and a constant increase in the quantity of air pollutants. Moreover, the presence of air pollution due to climate change can increase a person's risk of developing certain respiratory diseases. Studies found that acute respiratory problems associated with chronic respiratory diseases like asthma result from extreme heat and are exacerbated by the presence of air pollutants (Yang et al., 2018; Yusa et al., 2015). Drought and increasing temperature and precipitation favor the concentration of air contaminants that can trigger acute episodes of obstructive airway diseases (Yusa et al., 2015). Moreover, increased environmental temperatures place additional stress on the respiratory system, especially for those with chronic respiratory disorders (Ebi et al., 2021; Seposo et al., 2015; Yang et al., 2018). So, although certain climate change events trigger exacerbations of chronic respiratory problems, they do not directly contribute to the development of these diseases.

Similarly, the results showed that the respondents believe cardiovascular disease morbidity and mortality due to climate change result from an increase in environmental temperature or heat waves, which can aggravate symptoms of cardiovascular disease like chest pain and fatigue and may cause certain conditions like heat stroke, especially among the elderly. This is also consistent with the findings of previous studies (Felicilda-Reynaldo et al., 2018; La Torre et al., 2020; Yang et al., 2018). Cardiovascular system effects of climate change arise from the occurrence of more intense heat waves (Crowley & HPPC/ACP, 2016; Ebi et al., 2021; Opoku et al., 2021). However, extreme cold can also affect morbidity and mortality from cardiovascular diseases as it triggers the emergence of symptoms of these diseases (Gumabay et al., 2018).

The respondents further asserted that climate change affects the immune system of an individual, which increases vulnerability to disease. However, previous studies conducted among nursing students or healthcare professionals have not focused on this finding. Other studies found that the elderly and children are among those with high vulnerability to the effects of climate change on health, especially for respiratory and cardiovascular diseases (Cianconi et al., 2020; Ebi et al., 2021; Kreslake et al., 2016). This is because an individual's ability to adapt to the changes in the weather declines with advancing age (Seposo et al., 2015). However, a variety of factors increase an individual's susceptibility to the effects of climate change on health, which physiologic factors such as age, sex, pregnancy, underlying conditions; socio-behavioral factors such as low socioeconomic status, outdoor work, cultural-traditional groups; environmental factors such as certain geographical locations, and health system factors such as access and availability of health resources (Cianconi et al., 2020; Ebi et al., 2021; Harper et al., 2015; Kreslake et al., 2016; McIver et al., 2016). It can be observed that the understanding of the nursing students of the effects of climate change on non-communicable diseases is greatly determined by their understanding of the effects of environmental conditions on the disease process of non-communicable diseases. This further implies a good grasp on the interplay between environmental risk factors that contribute to the development of non-communicable diseases. However, there is limited understanding on other risk factors that contribute to non-communicable disease susceptibility in relation to climate change.

4.2.2 Climate change as a modifying factor of communicable disease

The results also showed that respondents believe climate change causes changes in the characteristics of certain infectious diseases like water-borne infections (e.g., diarrheal diseases and leptospirosis), food-borne infections, and vector-borne infections (e.g., dengue fever) such as increase in prevalence of infectious diseases, changes in the seasonal pattern and geographic distribution of certain diseases like dengue, and increase in the spread of and vulnerability to certain infections. This is also consistent with the findings of previous research conducted among nursing students (Felicilda-Reynaldo et al., 2018; La Torre et al., 2020; Yang et al., 2018). Majority of scientific data identified the increase in the prevalence of infectious diseases to be the most significant effect of climate change on health in the Philippines and in other countries

(Cianconi et al., 2021). Increased prevalence of infectious diseases may be attributed to changes in vector population and behavior, expansion of geographical range of infectious diseases, and changes in water, food safety, and security (Ajuang et al., 2016; Felicilda-Reynaldo et al., 2018; McMichael, 2015; Maxwell & Blashki, 2016;).

The respondents also attributed these changes to infectious disease characteristics to shifting of climate or weather patterns and increase in the incidence and intensity of extreme weather events like typhoons and flooding, which favor the proliferation of vectors and reservoirs of infectious agents. This is also consistent with the findings of previous research conducted among nursing students (Felicilda-Reynaldo et al., 2018; La Torre et al., 2020; Yang et al., 2018). Moreover, research findings confirm that torrential rain, which causes flooding, increase in ambient temperature, and water insecurity are the major contributors to the effects of climate change on infectious diseases (Seposo et al., 2015; Yusa et al., 2015).

The findings of this study also identified that, similar with non-communicable diseases, vulnerability to infectious diseases also increases due to climate change, especially among vulnerable populations. As discussed in the previous section, vulnerability to the effects of climate change on health may increase due to a variety of factors (Cianconi et al., 2020; Ebi et al., 2021; Harper et al., 2015; Kreslake et al., 2016; McIver et al., 2016). This is also applicable to communicable diseases (Cianconi et al., 2020). The perceptions of nursing students on the effects of climate change on communicable diseases present an adequate understanding on how environmental factors and events such as flooding and temperature changes contribute to changes in the patterns of these diseases. This may stem from the students' background on the ecological model of infectious disease occurrence and transmission. However, there are limitations in considering multiple factors that contribute to the vulnerability of individuals to infectious diseases in relation to climate change.

5. Implications and limitations

As this is the first study of this nature conducted in the Philippines, this study provides insight on the perceptions of nursing students in the country about climate change and its effects on human health. This study can then serve as a guide for other nursing researchers to further enrich the knowledge based on this topic. Moreover, initial improvements on the nursing curriculum can be made in the locale of the study based on the findings. As the nursing curriculum in the country has recently implemented the inclusion of Disaster Nursing subject within the nursing curriculum, this can be an avenue for the discussion of concepts related to climate change and its effects on health among nursing students.

This study has various limitations that necessitate further exploration. The effects of climate change can vary from one geographical location to another. Other allied health professionals also play a key role in mitigating the effects of climate change on health; therefore, an assessment of their perceptions must also be performed. As future health professionals, an in-depth and holistic understanding of the effects of climate change on health is needed by these students to effectively implement measures to prevent, mitigate, and address this global health threat in the future. Lastly, this study did not focus on how students deal with or address the effects of climate change on health, which is also essential for nurses and other healthcare professionals. This, too, can be further explored.

6. Conclusion

The findings of the study reveal that nursing students have an adequate understanding of climate change and are aware that it negatively affects health. However, their perceptions of the effects of climate change on health are limited to its effects on non-communicable, specifically cardiovascular and respiratory diseases and infectious diseases, as this reflects their understanding of how environmental factors affect disease pathogenesis or development. However, these effects cited are limited to physiologic health. As health is a multi-dimensional concept, climate change also affects other dimensions of human health. The students also failed to acknowledge certain factors that greatly determine the effects of climate change on health, such as geographical, socioeconomic, and health system factors. Moreover, the students have limited knowledge on the effects of climate change on physical safety, nutrition, and mental health, which are also very important health issues that must be addressed. The findings, therefore, suggest that these students need a more holistic understanding of the effects of climate change on health to better prepare them for addressing these issues in their future practice. This study further recommends a need for an in-depth instruction of student nurses about the effects of climate change on health. Therefore, the possibility of incorporating such subject matter in nursing education must be explored. Exploration of the perceptions of nursing students about climate change and its effects on health can also be done in other parts of the country to determine consistencies or variations. This can help add to the knowledge base of the country about this topic. Moreover, a quantitative study can also be implemented to include a larger population to better the findings. Lastly, to better understand the preparedness of nursing students in addressing climate change and its effects, assessment of knowledge, attitudes and/or practices of students on mitigation and preparedness activities related to climate change should also be performed.

Acknowledgment

This research was self-funded with no financial support. The authors would like to thank all of the nursing students and instructors who provided their assistance during data collection. The authors would also like to thank the Dean and Master of Science in Nursing program faculty members of the School of Graduate Studies and Continuing Professional Development of the University of Saint Louis for their support in this study.

Author contribution

JPS and EMSG contributed to the conceptualization of the study, preparation of tools and instruments, data collection and processing, and manuscript preparation and revision. All authors have read and approved the final manuscript.

Conflict of interest

The authors do not have any form of conflict of interest in the conduct of this study.

References

Ajuang, C. O., Abuom, P. O., Bosire, E. K., Dida, G. O., & Anyona, D. N. (2016). Determinants of climate change awareness level in upper Nyakach Division, Kisumu County, Kenya. *SpringerPlus*, *5*(1), 1-20. https://doi.org/10.1186/s40064-016-2699-y

Alcayna, T., Bollettino, V., Dy, P., & Vinck, P. (2016). Resilience and disaster trends in the Philippines: Opportunities for national and local capacity building. *PLoS Currents*, *8,* ecurrents.dis.4a0bc960866e53bd6357ac135d740846. https://doi.org/10.1371/currents.dis.4a0bc960866e53bd6357ac135d740846

Anåker, A., Nilsson, M., Holmner, A., & Elf, M. (2015). Nurses' perceptions of climate and environmental issues: A qualitative study. *Journal of Advanced Nursing*, *71*(8), 1883-1891. https://doi.org/10.1111/jan.12655

Assarroudi, A., Heshmati Nabavi, F., Armat, M. R., Ebadi, A., & Vaismoradi, M. (2018). Directed qualitative content analysis: The description and elaboration of its underpinning methods and data analysis process. *Journal of Research in Nursing*, *23*(1), 42-55. https://doi.org/10.1177/1744987117741667

Butler, C. D. (2018). Climate change, health and existential risks to civilization: A comprehensive review (1989–2013). *International journal of environmental research and public health*, *15*(10), 2266. https://doi.org/10.3390/ijerph15102266

Cabilao-Valencia, M. I., Ali, M., Maryani, E., & Supriatna, N. (2019). Integration of disaster risk reduction in the curriculum of Philippine educational institution. In *3rd Asian Education Symposium (AES 2018)* (pp. 463-468). Atlantis Press. https://doi.org/10.2991/aes-18.2019.104

Caranto, B. F., & Pitpitunge, A. D. (2015). Students' knowledge on climate change: Implications on interdisciplinary learning. In *Biology Education and Research in a Changing Planet: Selected Papers from the 25th Biennial Asian Association for Biology Education Conference* (pp. 21-30). Springer Singapore. https://doi.org/10.1007/978-981-287-524-2_3

Cianconi, P., Betrò, S., & Janiri, L. (2020). The impact of climate change on mental health: A systematic descriptive review. *Frontiers in Psychiatry*, *11*, 490206. https://doi.org/10.3389/fpsyt.2020.00074

Crowley, R. A., & Health and Public Policy Committee of the American College of Physicians. (2016). Climate change and health: A position paper of the American College of Physicians. *Annals of Internal Medicine*, *164*(9), 608-610. https://doi.org/10.7326/M15-2766

Debela, N., Mohammed, C., Bridle, K., Corkrey, R., & McNeil, D. (2015). Perception of climate change and its impact by smallholders in pastoral/agropastoral systems of Borana, South Ethiopia. *SpringerPlus*, *4*(1), 1-12. https://doi.org/10.1186/s40064-015-1012-9

Domantay, J. A. A., Leochico, C. F. D., Salvador, P. A. G. S., Ciriaco, V. M., Abad, P. R., Capistrano, V. E., Cruz, G. M., Darang, L. C., Rosario, D. M. D., Gadgad, J. A., Pagalanan, J., Palaylay, A., Perez, F. J. & Torres, C. P. (2021).Knowledge and attitudes of future physicians in the Cordillera region of the Philippines towards climate change: A pre-pandemic cross-sectional study. *The Journal of Climate Change and Health*, *4*, 100063. https://doi.org/10.1016/j.joclim.2021.100063

Dupraz, J., & Burnand, B. (2021). Role of health professionals regarding the impact of climate change on health—an exploratory review. *International Journal of Environmental Research and Public Health*, *18*(6), 3222. https://doi.org/10.3390/ijerph18063222

Ebi, K. L., Vanos, J., Baldwin, J. W., Bell, J. E., Hondula, D. M., Errett, N. A., Hayes, K., Reid, C.E., Saha, S., Spector, J., & Berry, P. (2021). Extreme weather and climate change: Population health and health system implications. *Annual Review of Public Health*, *42*(1), 293-315. https://doi.org/10.1146/annurev-publhealth-012420-105026

Etikan, I. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1-4. https://doi.org/10.11648/j.ajtas.20160501.11

Felicilda-Reynaldo, R. F. D., Cruz, J. P., Alshammari, F., Obaid, K. B., Rady, H. E. A. E. A., Qtait, M., Alquwez, N., & Colet, P. C. (2018). Knowledge of and attitudes toward climate change and its effects on health among nursing students: A multi-Arab country study. *Nursing Forum*, *53*(2), 179–189. https://doi.org/10.1111/nuf.12240

Gumabay, E. M. S., Ramirez, R. C., Dimaya, J. M. M., & Beltran, M. M. (2018). Adversity of prolonged extreme cold exposure among adult clients diagnosed with coronary artery diseases: A primer for recommending community health nursing intervention. *Nursing Open*, *5*(1), 62-69. https://doi.org/10.1002/nop2.111

Hathaway, J., & Maibach, E. W. (2018). Health implications of climate change: A review of the literature about the perception of the public and health professionals. *Current Environmental Health Reports*, *5*, 197-204. https://doi.org/10.1007/s40572-018-0190-3

Harper, S. L., Edge, V. L., Ford, J., Willox, A. C., Wood, M., IHACC Research Team, RICG& McEwen, S. A. (2015). Climate-sensitive health priorities in Nunatsiavut, Canada. *BMC Public Health*, *15*, 1-18. https://doi.org/10.1186/s12889-015-1874-3

Kreslake, J. M., Sarfaty, M., & Maibach, E. W. (2016). Documenting the human health impacts of climate change in tropical and subtropical regions. *The American Journal of Tropical Medicine and Hygiene*, *95*(2), 260. https://doi.org/10.4269%2Fajtmh.16-0400

La Torre, G., Sestili, C., Cocchiara, R. A., Barbato, D., Mannocci, A., & Del Cimmuto, A. (2020). Knowledge and perception about climate change among healthcare professionals and students: A cross-sectional study. *South Eastern European Journal of Public Health, 13*. https://doi.org/10.56801/seejph.vi.155

Liao, W., Yang, L., Zhong, S., Hess, J. J., Wang, Q., Bao, J., & Huang, C. (2019). Preparing the next generation of health professionals to tackle climate change: Are China's medical students ready?. *Environmental Research*, *168*, 270-277. https://doi.org/10.1016/j.envres.2018.10.006

Lujala, P., Lein, H., & Rød, J. K. (2015). Climate change, natural hazards, and risk perception: The role of proximity and personal experience. *Local Environment*, *20*(4), 489-509. https://doi.org/10.1080/13549839.2014.887666

Maxwell, J., & Blashki, G. (2016). Teaching about climate change in medical education: An opportunity. *Journal of Public Health Research*, *5*(1), 673. https://doi.org/10.4081/jphr.2016.673

McIver, L., Kim, R., Woodward, A., Hales, S., Spickett, J., Katscherian, D., Hashizume, M., Honda, Y., Kim, H., Iddings, S., Naicker, J., Bambrick, H., McMichael, A. J., & Ebi, K. L. (2016). Health impacts of climate change in Pacific Island countries: A regional assessment of vulnerabilities and adaptation priorities. *Environmental Health Perspectives*, *124*(11), 1707-1714. https://doi.org/10.1289/ehp.1509756

McMichael, C. (2015). Climate change-related migration and infectious disease. *Virulence*, *6*(6), 548-553. https://doi.org/10.1080/21505594.2015.1021539

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. John Wiley & Sons.

National Aeronautics and Space Administration. (2015). Global Climate Change: Vital signs of the planet. http://climate.nasa.gov/faq/

Ofori, B. Y., Ameade, E. P., Ohemeng, F., Musah, Y., Quartey, J. K., & Owusu, E. H. (2023). Climate change knowledge, attitude and perception of undergraduate students in Ghana. *PLOS Climate*, *2*(6), e0000215. https://doi.org/10.1371/journal.pclm.0000215

Opoku, S. K., Filho, W. L., Hubert, F., & Adejumo, O. (2021). Climate change and health preparedness in Africa: analysing trends in six African countries. *International Journal of Environmental Research and Public Health*, *18*(9), 4672. https://doi.org/10.3390/ijerph18094672

Polit, D.F. and Beck C.T. (2018). *Essentials of nursing research: Appraising evidence for nursing practice* (9th eds.). Wolters Kluwer Health

Rocque, R. J., Beaudoin, C., Ndjaboue, R., Cameron, L., Poirier-Bergeron, L., Poulin-Rheault, R. A., Fallon, C., Tricco, A. C., & Witteman, H. O. (2021). Health effects of climate change: an overview of systematic reviews. *BMJ Open*, *11*(6), e046333. https://doi.org/10.1136/bmjopen-2020-046333

Seposo, X. T., Dang, T. N., & Honda, Y. (2015). Evaluating the effects of temperature on mortality in Manila city (Philippines) from 2006–2010 using a distributed lag nonlinear model. *International Journal of Environmental Research and Public Health*, *12*(6), 6842-6857. https://doi.org/10.3390/ijerph120606842

Siña, M., Wood, R. C., Saldarriaga, E., Lawler, J., Zunt, J., Garcia, P., & Cárcamo, C. (2016). Understanding perceptions of climate change, priorities, and decision-making among municipalities in Lima, Peru to better inform adaptation and mitigation planning. *PloS One*, *11*(1), e0147201. https://doi.org/10.1371/journal.pone.0147201

Sun, L., Fang, S., Iqbal, S., & Bilal, A. R. (2022). Financial stability role on climate risks, and climate change mitigation: Implications for green economic recovery. *Environmental Science and Pollution Research*, *29*(22), 33063-33074. https://doi.org/10.1007/s11356-021-17439-w

Weilnhammer, V., Schmid, J., Mittermeier, I., Schreiber, F., Jiang, L., Pastuhovic, V., Herr, C., & Heinze, S. (2021). Extreme weather events in europe and their health consequences–A systematic review. *International Journal of Hygiene and Environmental Health*, *233*, 113688. https://doi.org/10.1016/j.ijheh.2021.113688

World Health Organization. (2021). 2021 WHO health and climate change global survey report. World Health Organization. https://apps.who.int/iris/bitstream/handle/10665/348068/9789240038509-eng.pdf

Yang, L., Liao, W., Liu, C., Zhang, N., Zhong, S., & Huang, C. (2018). Associations between knowledge of the causes and perceived impacts of climate change: A cross-sectional survey of medical, public health and nursing students in universities in China. *International Journal of Environmental Research and Public Health*, *15*(12), 2650. https://doi.org/10.3390/ijerph15122650

Yusa, A., Berry, P., Cheng, J. J., Ogden, N., Bonsal, B., Stewart, R., & Waldick, R. (2015). Climate change, drought and human health in Canada. *International Journal of Environmental Research and Public Health*, *12*(7), 8359-8412. https://doi.org/10.3390/ijerph120708359

Zaman, F. (2021). The role of popular discourse about climate change in disaster preparedness: A critical discourse analysis. *International Journal of Disaster Risk Reduction*, *60*, 102270. https://doi.org/10.1016/j.ijdrr.2021.102270

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):29-39, April 2024
https://doi.org/10.14710/nmjn.v14i1.57708

ORIGINAL RESEARCH

Socio-Demographic and Clinical Profiles Associated with Sodium Consumption Behaviors in Patients with Non-Dialysis Chronic Kidney Disease: A Study in Myanmar

Kay Thi Hlaing[1], Aurawamon Sriyuktasuth[2], Warunee Phligbua[2]

[1]*Master of Nursing Science Program (International Program), Faculty of Nursing, Mahidol University, Bangkok, Thailand*
[2]*Department of Medical Nursing, Faculty of Nursing, Mahidol University, Bangkok, Thailand*

Article Info

Article History:
Received: 26 August 2023
Revised: 3 April 2024
Accepted: 4 April 2024
Online: 30 April 2024

Keywords:
Chronic kidney disease; Myanmar; non-dialysis; sodium consumption behaviors

Corresponding Author:
Aurawamon Sriyuktasuth
Department of Medical Nursing,
Faculty of Nursing,
Mahidol University, Bangkok,
Thailand
Email:
aurawamon.sri@mahidol.ac.th

Abstract

Background: Sodium consumption behaviors (SCB) play a significant role in the development of kidney failure and associated comorbidities in patients with chronic kidney disease (CKD). Despite the widespread harmful effects of excessive salt consumption, factors influencing SCB in patients with non-dialysis CKD are still little known in Myanmar. No previous study was carried out among Myanmar populations with non-dialysis CKD.

Purpose: This study aimed to identify the association between socio-demographic and clinical profiles and SCB in patients with non-dialysis CKD in Myanmar.

Methods: Cross-sectional data of 123 patients with non-dialysis CKD, gathered from a tertiary hospital-based study in Myanmar, were analyzed. Non-dialysis CKD patients who had been diagnosed with CKD for more than 3 months were recruited via convenience sampling. Data were collected using demographic and clinical characteristics data form, and Sodium Consumption Behaviors Questionnaire (SCBQ). Descriptive and inferential statistics were employed for data analysis.

Results: The mean score of SCB was 31.5 (SD=5.1), indicating quite good behaviors. Participants who had high education (β= -.233, *p*= .006) and old age (β= -.169, p= .048) were more likely to have good SCB, whereas participants who took antihypertensive medication (β= .304, *p*= .001) and had comorbidities (β= .232, *p*=.006) were more likely to have poor SCB.

Conclusion: The participants in this study displayed quite favorable SCB. Educational level, age, taking antihypertensive medication, and comorbidity significantly contributed to SCB. Hence, nurses and other healthcare providers should screen patients with these characteristics and provide health education to promote good SCB and prevent the progression of CKD in non-dialysis CKD patients in Myanmar.

How to cite: Hlaing, K. T., Sriyuktasuth, A., & Phligbua, W. (2024). Socio-demographic and clinical profiles associated with sodium consumption behaviors in patients with non-dialysis chronic kidney disease: A study in Myanmar. *Nurse Media Journal of Nursing, 14*(1), 29-39. https://doi.org/10.14710/nmjn.v14i1.57708

1. Introduction

Chronic Kidney Disease (CKD), one of the significant global non-communicable diseases (NCD), is usually caused by diabetes and hypertension (Cockwell & Fisher, 2020). The incidence and prevalence rates of CKD continue to rise worldwide (Ameh et al., 2020). In the United States, it was found that about 37 million adults suffered from CKD (or more than 1 in 7 US adults), and most are undiagnosed (Centers for Disease Control and Prevention [CDC], 2021). Evidence suggests that CKD is a key contributor to morbidity and mortality (Kaze et al., 2018). It can lead to increased risks of cardiovascular morbidity, anemia, bone mineralization disorder, salt and water retention, electrolyte disturbances, premature mortality, and poor life expectancy (Bello et al., 2017; Singh & Krause, 2021). If people progress to chronic kidney failure (CKF), they need dialysis treatment or kidney transplantation (Braun & Khayat, 2021). Importantly, these treatments are difficult to access, and the cost is extremely high in Myanmar (Alexander et al., 2021). Therefore, slow progression of CKD is essential in this population.

Sodium consumption behaviors (SCB) play a cornerstone in CKD progression and consequences. People living with CKD are salt-sensitive (Nerbass et al., 2018). Reducing sodium intake has the potential to delay the worsening of kidney function and preserve residual kidney function for a longer period, resulting in extending dialysis treatment. A systemic review showed that high sodium consumption can significantly rise the progression of CKD (Kelly et al., 2021). According to WHO (2020), many people daily consume 9-12 grams of salt which is double than WHO recommended level. Cho et al. (2016) revealed that Myanmarese also consumed too much salt due to their food culture and high salt taste threshold. A study by Niyomchit and colleagues (2019) found that the Thai diabetic population had poor SCB and their SCB contributed to CKD progression. Although studies in different countries have highlighted the significance of SCB, knowledge regarding SCB in people with non-dialysis CKD in Myanmar is limited. Only one such study was conducted in Myanmar by Mon et al. (2022) who found that patients with CKD who have not been receiving dialysis treatment (non-dialysis CKD patients) had low to moderate consumption of salt intake, and those who had good SCB had better blood pressure control. Moreover, among Myanmarese with non-dialysis CKD, little is known about factors associated with their SCB. Additional study is needed to explore SCB' associated factors in this underserved population.

Factors thought to influence SCB include both socio-demographic and clinical factors. However, the findings from previous studies are somewhat mixed. Some studies reported that older age was associated with higher sodium consumption in CKD and healthy populations (Meuleman et al., 2018; Reyhani et al., 2020), while some found no association between age and sodium intake in a hypertensive population (Wicaksana et al., 2021). Some previous studies found an influence of gender on SCB in healthy, hypertensive, and type 2 diabetes populations (Aziz et al., 2021; Ko et al., 2018; Reyhani et al., 2020), whereas others found no association in non-dialysis CKD and heart failure patients (Meuleman et al., 2018; Smith et al., 2019). Mestral et al. (2017) conducted a systematic review and reported that individuals with low socioeconomic status had excessive sodium consumption. Similarly, some studies reported educational level as an associated factor of SCB in non-dialysis CKD, dialysis CKD and healthy populations in the Netherlands, US, and Thailand (Brouillard et al., 2019; Chailimpamontree et al., 2020; Meuleman et al., 2018; Santin et al., 2018). However, one study found that education was not a significant factor for SCB in Indian healthy adults (Johnson et al., 2019). Although previous studies have investigated among different populations, no study identified the association of these socio-demographic factors and SCB among Myanmar patients with non-dialysis CKD.

Previous studies have found that CKD severity, comorbid conditions, taking antihypertensive medications, and follow-up care had affected SCB in non-dialysis CKD, diabetic, hypertensive, and healthy populations (Aparna et al., 2019; Burnier et al., 2020; Keasler et al., 2021; Meuleman et al., 2018; Nerbass et al., 2018; Niyomchit et al., 2019; Smith et al., 2019). Welsh et al. (2019) revealed that people with comorbid conditions consumed lower sodium foods due to prescribed regimens or nutrition deficiency. A study also found that people who were receiving hypertensive treatments had lower sodium intake (Hong et al., 2016). Another study in Ghana by Saah et al. (2021) examined that regular follow-up care can reduce unhealthy health related lifestyles, especially consumption of junk foods. However, others reported no association between these clinical factors and SCB in non-dialysis CKD and hypertensive populations (Akbarpour et al, 2018; Meuleman et al, 2018; Petersen et al, 2020).

Although many studies have been conducted to explore the association between socio-demographic and clinical factors and SCB, many of them were conducted in various populations with different contexts, and the results are inconclusive. To date, little is known about the associations between these factors and SCB among non-dialysis CKD patients in Myanmar. Therefore, this study aimed to examine which socio-demographic and clinical characteristics are associated with SCB in this population.

2. Methods

2.1. Research design

This study is a secondary analysis study. A correlational study design was employed to examine the association between socio-demographic and clinical factors and SCB in non-dialysis CKD patients in Myanmar.

2.2. Setting and samples

The primary study was conducted at out-patient clinics in a tertiary hospital in Myanmar from February to May 2020. Data from a hospital-based study to explore blood pressure control in 150 non-dialysis CKD patients by Mon et al. (2022) were used due to data collection challenges during COVID-19 pandemic and political situation in Myanmar. Participants were recruited if they had eGFR less than 60 ml/min/1.73m^2, had never been treated with dialysis, could communicate in Burmese, had no severe physical and mental illnesses, had no cognitive impairment, and had no changes in antihypertensive medications during the past three months. If the participants were diagnosed with psychiatric problems, suffered from severe physical conditions, taking medications affecting blood pressure (i.e., cold medicines, analgesics, immune-suppressants, antacids, oral contraceptives), had changes in hypertensive medications in the past three months, or had cognitive impairment by having a score <9 in General Practitioner Assessment of Cognitive (GPCOG) Patients Examination, and experienced renal replacement therapy, they were excluded. However, this study employed only data from the participants who were diagnosed with CKD for over three months as inclusion criteria to ensure that the behaviors of salt consumption in which the participants' responses are their behaviors during being diagnosed as CKD. Therefore, data of 123 participants were selected.

G-Power software 3.1.9.4 was utilized to assure the appropriateness of the sample size in this study. With a power of 0.85, a significance level of .05, a medium effect size of 0.15 ($f^2 \geq 0.15$) according to Cohen's (1988) guidelines, and 8 independent variables, a minimum sample size of 120 was required. Thus, the number of 123 samples is appropriate for this study.

2.3. Measurement and data collection

Data from the original study were collected by the principal investigator at the outpatient clinics at a tertiary hospital, Myanmar. Details of data collection procedures and measurement were published in the study of Mon et al. (2022). In this study, the independent variables included socio-demographic (age, gender, educational level, income, and follow-up visit) and clinical (CKD severity, comorbidity, and taking antihypertensive medication) characteristics. In this study, the CKD severity (eGFR) was classified based on the CKD stage (eGFR) as follows: stage 3 CKD with eGFR of 30-59 ml/min/1.73m^2 ; stage 4 CKD with eGFR of 15- 29 ml/min/1.73m^2 ; and stage 5 CKD with eGFR of <15 ml/ min/1.73m^2 (KDIGO Work Group, 2013). These data and other characteristics (e.g., marital status, occupation, smoking, alcohol drinking, and cooking meal) were obtained from the demographic and clinical characteristics data form designed by Mon et al. (2022). The participants responded to the part of socio-demographic form during their waiting time at the clinic. The clinical data were collected from medical records with the participants' permission.

The dependent variable in this study was SCB obtained from Sodium Consumption Behavior Questionnaire (SCBQ) developed by Piaseu et al. (2020). The SCBQ was translated into Burmese language by using the back-translation method (Mon et al., 2022). The questionnaire is valid and reliable. The content validity was tested by the experts, and content validity index (CVI) of .95 was found. The Cronbach's alpha of .82 was derived from administering the study questionnaire to 30 participants who had similar characteristics with the samples (Mon et al., 2022). The SCBQ consists of 13 items with 3 subscales. Each item was rated from 1 to 5. Response options range from 'regularly'(1) to 'never'(5) for positive items, and the reverse for negative items. Possible scores range from 13 to 65. Lower scores indicate better SCB. A total score of 13-32 was considered low; 33-51, moderate; and 52-65, high SCB. Then, the researchers obtained the required data for statistical analysis.

2.4. Data analysis

Statistical Package for the Social Science (SPSS) version 18.0 licensed by Mahidol University was used to perform data analysis. The level of significance of p<.05 was set. Descriptive statistics were used to describe the characteristics of the participants and study variables. Categorical data were analyzed as frequency and percentage. Continuous data were expressed as mean, and standard deviation. Pearson's product-moment correlation and multiple regression analysis (enter method) were performed to determine the association between the socio-demographic (age, gender, income, education) and clinical factors (CKD severity (eGFR), comorbidity, taking medication, and follow-up visit on SCB among patients with non-dialysis CKD in Myanmar. Assumptions were tested and satisfactorily met.

2.5. Ethical considerations

The researcher used the data after getting approval from Institutional Review Board from Faculty of Nursing, Mahidol University (IRB-NS 2022/28.0703). Permission to use the data was granted from the researchers of the original study. All data were used only for this study and were kept safe from unauthorized access, or accidental loss or destruction. The results were reported as a group and no individual data were identified.

3. Results

3.1. Socio-demographic and clinical characteristics of the participants

The mean age of the participants was 59.3 years (SD = 12.2). Most of the participants were male, married, and employed. The mean family monthly income was 144 USD (SD = 101). Many participants have attained an education at the level of high school or higher. Regarding clinical characteristics, over one-third of participants had CKD Stage 3. A similar number of participants were found in CKD Stages 4 and 5. Most of the participants had comorbidities, took antihypertensive medications, and had regular follow-up visits. Most of the meals were prepared by family members. In addition, most participants added seasoning to their meals. These characteristics of the participants are shown in Table 1.

Table 1. Characteristics of the participants (n=123)

Characteristics	Frequency	Percentage
Age (years) (Mean = 59.3, SD = 12.2, Range = 23-90)		
<44	17	13.8
44-60	42	34.2
61-75	56	45.5
76-90	8	6.5
Gender		
Male	70	56.9
Female	53	43.1
Marital status		
Single	19	15.4
Married	79	64.2
Divorced	2	1.7
Widowed/Widower	23	18.7
Educational level (years)		
0 (No formal education)	18	14.6
9 (Secondary school)	21	17.0
11 (High school)	13	10.6
14 (Diploma)	59	48.0
15 (Bachelor degree)	12	9.8
Occupation		
Unemployed	49	39.8
Own business	17	13.8
Company staff	1	0.8
Government employee	4	3.3
Farmer	25	20.3
Pensioner	9	7.4
Others	18	14.6
Family monthly income (USD) (Mean = 144, SD = 101, Range = 32-539)		
≤80	20	20.3
81 - 300	91	74.0
301 - 539	7	5.7
CKD severity (eGFR) (Mean = 26.8, SD = 16.8, Range = 2-59 ml/min/1.73m^2)		
30-59 (Stage 3)	49	39.8
15-29 (Stage 4)	38	30.9
<15 (Stage 5)	36	29.3

Table 1. Continued

Characteristics	Frequency	Percentage
Comorbidity		
Yes	115	93.5
No	8	6.5
Taking Medication		
Taking antihypertensive medication	104	84.6
Regular follow-up	116	94.3
Irregular follow-up	7	5.7
Reason of irregular follow-up visit		
High cost of treatment	2	28.6
No one to accompany	2	28.6
None specific reasons	3	42.8
Smoking		
Never smoked	85	69.1
Former smoker	36	29.3
Current smoker	2	1.6
Alcohol drinking		
Lifelong abstainer	93	75.7
Current regular drinker	1	0.8
Former occasional drinker	18	14.6
Former regular drinker	11	8.9
Person who prepares/ cooks meal		
By self	27	22.0
Family members	94	76.4
Buying outside	2	1.6

3.2. Sodium consumption behaviors among the participants

As shown in Table 2, the mean score of SCB measured by SCBQ was 31.5 (SD = 5.1) indicating quite a favorable level. More specifically, over half of the participants (56.9%) had a low level of SCB, while 43.1% had a moderate level of SCB. No participants with a high score for SCB were found in this study.

Table 2. Level of sodium consumption behaviors

Level of sodium consumption behaviors	Possible range	Actual range	f	%
Overall (Mean = 31.5, SD = 5.1)	13-65	13-51	123	100.0
Low	13-32	13-32	70	56.9
Moderate	33-51	33-51	53	43.1

Nearly all the participants (90.2%) had never read the nutrition labels, never looked at the amount of sodium, and never bought low-sodium foods. Moreover, most participants reported that they regularly consumed vegetables, had never added seasoning or sauces to their food, and never consumed canned or fast food. However, many reported having snacks sometimes. See the data in Table 3.

Table 3. Sodium consumption behaviors among the participants by items

Sodium consumption behaviors (SCB)	Possible range	Actual range	Frequency of sodium consumption behaviors of the participants n(%)					Mean	SD
			Regularly	Frequently	Sometimes	Rarely	Never		
1. Reading nutrition labels	1-5	3-5	0(0)	0(0)	6(4.9)	6 (4.9)	111(90.2)	4.8	0.5
2. Reading the amount of sodium	1-5	3-5	0(0)	0(0)	6(4.9)	6 (4.9)	111(90.2)	4.8	0.5
3. Buying low sodium food	1-5	3-5	0(0)	0(0)	6(4.9)	6 (4.9)	111(90.2)	4.8	0.5
4. Consuming vegetables	1-3	1-3	83(67.5)	5(4.1)	26(21.1)	7(5.7)	2(1.6)	1.7	1.1
5. Consuming salty food	1-3	1-3	3(2.4)	9(7.4)	47(38.2)	16(13)	48(39)	2.2	1.1
6. Adding seasoning in food	1-3	1-3	2(1.6)	3(2.4)	11(8.9)	6(4.9)	101(82.2)	1.4	0.9
7. Adding sauce in food	1-3	1-3	0(0)	2(1.6)	25(20.4)	16(13)	80(65)	1.6	0.9
8. Eating fruits with salt	1-3	1-3	2(1.6)	3(2.4)	20(16.3)	4(3.3)	94(76.4)	1.5	1.0

Table 3. Continued

Sodium consumption behaviors (SCB)	Possible range	Actual range	Frequency of sodium consumption behaviors of the participants n(%)					Mean	SD
			Regularly	Frequently	Sometimes	Rarely	Never		
9. Consuming processed food	1-3	1-3	3(2.4)	13(10.6)	45(36.6)	24(19.5)	38(30.9)	2.3	1.1
10. Consuming canned food	1-3	1-3	0(0)	0(0)	13(10.6)	3(2.4)	107(87)	1.2	0.6
11. Consuming fast food	1-3	1-3	0(0)	1(0.8)	2(1.6)	3(2.4)	117(95.2)	1.1	0.4
12. Eating snacks	1-3	1-3	2(1.6)	16 (13)	59 (48)	21(17.1)	25 (20.3)	2.6	1.0
13. Drinking beverages	1-3	1-3	1(0.8)	2(1.6)	14(11.4)	10 (8.2)	96(78)	1.4	0.8

3.3. Correlation among the study variables

Regarding the correlations among the study variables, Pearson's product-moment correlation was computed. The findings showed that educational level ($r = -.228$, $p = .006$) had significant negative correlation with SCB, while comorbidity ($r = .230$, $p = .005$), follow-up visit ($r = .167$, $p = .033$), and taking medication ($r =.286$, $p = .001$) had significant positive correlations with SCB among patients with non-dialysis CKD. No significant correlation among the independent variables was found (Table 4).

Table 4. Correlation matrix of the study variables (n=123)

Variables	1	2	3	4	5	6	7	8	9
1. Age	1								
2. Gender	.146	1							
3. Educational level	.051	-.117	1						
4. Income	-.061	-.224	.168	1					
5. Follow-up visit	.046	.072	-.089	-.051	1				
6. CKD severity (eGFR)	.115	-.024	.114	.057	-.032	1			
7. Co-morbidity	.244	.103	-.071	.056	.065	.022	1		
8. Taking medication	.122	.082	-.007	-.104	.105	-.306	.070	1	
9. SCB	-.113	-.128	-.228**	.136	.167*	-.126	.230**	.286**	1

Notes: Pearson's product-moment correlation, 1=Age; 2=Gender; 3=Education; 4=Income; 5=Follow-up visit; 6=CKD severity (eGFR); 7=Co-morbidity; 8=Taking medication; 9=SCB
**Significant at *p*-value <.01; *Significant at *p*-value <.05

3.4. Multiple linear regression analysis for the factors associated with SCB

As shown in Table 5, the results of multiple linear regression analysis indicated that age, gender, educational level, income, CKD severity, comorbidity, taking antihypertensive medication, and follow-up-visit accounted for 22.4% of the variance in SCB among Myanmarese patients with non-dialysis CKD ($R^2 = .224$, $F_{(8,114)} = 5.396$, $p<.001$). Moreover, age, educational level, comorbidity, and taking antihypertensive medication were significantly associated with SCB. Gender, income, CKD severity (eGFR), and follow-up visit did not significantly contribute to SCB in this population.

Table 5. Factors associated with SCB

Model	B	SE	β	t	*p*-value
Constant	29.338	2.637		11.126	<.001
Age	-0.070	0.035	-0.169	-1.997	.048
Gender	-1.583	0.856	-0.154	-1.850	.067
Educational level	-0.294	0.104	-0.233	-2.830	.006
Income	4.210	0.000	0.156	1.860	.065
CKD severity	0.000	0.026	-0.001	-0.012	.990
Comorbidity	4.789	1.717	0.232	2.790	.006
Taking medication	4.271	1.207	0.304	3.540	.001
Follow-up visit	2.756	1.771	0.126	1.556	.122

Notes:
Multiple linear regression analysis, B: Regression coefficient, SE: Standard error, β: Standardized regression coefficient; R = .524, R-squared = .275, Adjusted R-squared = .224, $F_{(8,114)} = 5.396$, Significant at *p*-value <.05

4. Discussion

This study measured SCB by the participants' self-report using SCBQ. The mean score of the SCB in the present study indicates that the participants displayed rather favorable SCB, and no participant reported high sodium consumption. These Myanmarese participants reported better SCB than participants in other studies. For example, a study that also used the SCBQ and was conducted in Thailand among healthy nursing students found that the participants' SCB was moderate (Piaseu et al., 2020). Better SCB in this study may be due to the participants' characteristics and the Myanmar context. Myanmar is an agricultural country. Most people consume fresh meat, vegetables, and fruits daily. Fast food, canned food, and snacks are not popular. Conversely, people in Thailand prefer ready-to-eat food such as instant noodles, frozen food, and fast food, and like to season their dishes with condiments such as fish sauce, soy sauce, salt, and seasoning cubes when cooking (Chailimpamontree et al., 2020). Additionally, the participants in this study had been diagnosed with CKD Stages 3 to 5 and, thus, they might have received recommendations from healthcare professionals to limit sodium intake. They may be more concerned about their health conditions and tried harder to comply with the recommendations than their healthier counterparts.

However, it is interesting that most of the participants reported that they had never read the nutrition labels, never looked at the amount of sodium, and never deliberately bought low sodium foods. This finding differs from the results of a cross-sectional study in the US which found that almost a third of participants (31.4%) always read and look at nutrition labels on the packaged foods when buying or selecting the foods (Chan et al., 2019). Even though nutritional labels provide valuable information and help individuals make informed and healthier food choices, most Myanmarese have no interest in understanding about nutritional labels. In addition, there are no low-sodium or sodium-free options in the marketplace in Myanmar for patients who need to limit sodium intake. Access to low-sodium or sodium-free food products is one of the barriers to practicing low sodium consumption in that country. Our findings suggest that providing complete nutritional labels should be mandated, and health education should emphasize reading of nutritional labels and explaining its importance. Nurses should explore effective strategies to increase knowledge and awareness about SCB in this population.

The findings illustrated that taking antihypertensive medication was strongly associated with poor SCB. Non-dialysis CKD patients who were prescribed with anti-hypertensive medications were more likely to perform poorer sodium consumption behaviors than those who were not prescribed with. It is possible that people who are prescribed with antihypertensive medications may believe that they could consume more salty foods because the medications can control their blood pressure. In addition, patients who were prescribed ACE inhibitors had poor salt- taste sensitivity because of taste disturbance, resulting in high sodium intake (Smith et al., 2019).

Similarly, the presence of comorbidity was another clinical characteristic that significantly contributed to poor SCB among this population. This latter finding can be explained by the fact that Myanmarese patients with long-term comorbidities may have difficulty following low salt diet as recommended. They have complex treatment regimens, and they have barriers adhering to healthy consumption habits. This result was in line with previous studies in which the presence of comorbidities was more likely to have more sodium consumption (Meuleman et al., 2018; Nerbass et al., 2018). Previous studies stated that the presence of comorbidities can also influence the behaviors of sodium consumption (Burnier et al., 2020; Welsh et al., 2019).

Among socio-demographic characteristics, educational attainment was significantly associated with SCB in patients with non-dialysis CKD. This finding showed that the higher the education, the lower scores of SCB indicating good sodium consumption behaviors. The reason to explain this finding is that the more well-educated people are likely to have a better understanding about low salt intake. They may have better knowledge and skills to understand health information and benefits of limiting processed food consumption (Jessen et al., 2018). This finding is consistent with previous studies in which people with low education had excessive sodium intake among healthy populations in Montenegro and Korea (Delia et al., 2019; Hong et al., 2016). Interestingly, some studies found that higher education was significantly associated with excessive sodium consumption in different populations (Brouillard et al., 2019; Chailimpamontree et al., 2020). It can be shown that people with secondary level of education consumed more than those with primary education (Chailimpamontree et al., 2020). This might be because although they had high education, they might not have enough health education about healthy and unhealthy nutrition. Therefore, it depends on the diverse backgrounds or different settings of the participants.

Likewise, this study found that, once older, people displayed more favorable SCB. This might be because older people may change their eating behaviors because of their existing health status and more health-conscious (Aziz et al., 2021). In opposite with elderly age, youthful age group consumed ready-made foods and excessive caloric foods. In addition, young people have no intention to alter their current sodium consumption behaviors (Aziz et al., 2021). This finding was consistent with a study found that sodium consumption decreased with age among general population in US (Brouillard et al., 2019). Some previous studies found that younger age had a significant association with higher salt intake among general population in Thailand and Nepal (Chailimpamontree et al., 2020; Neupane et al., 2020). Interestingly, a study in Korea and China found that older age has significant higher sodium consumption than younger age (Hong et al., 2016; Lin et al., 2020). In contrast, some studies found that age cannot significantly predict sodium intake in the hypertensive population (Wicaksana et al., 2021). Hence, the findings depend on the attitude of the participants and setting of the study.

5. Implications and limitations

The findings in this study showed that Myanmarese patients with non-dialysis CKD had a favorable level of SCB. However, they had low practice in reading nutrition labels. Health care providers, including nurses, should provide health education to increase knowledge and skills needed to read and understand nutrition labels in making informed dietary choices. In addition, participants who took antihypertensive medication, had comorbidities, low education, and younger age had poor SCB. Hence, nurses should screen patients with these characteristics and implement effective strategies to promote good SCB and slow progression of CKD in patients with non-dialysis CKD in Myanmar.

The current study has some limitations. First, the results of the study cannot be generalized to the whole population of non-dialysis CKD patients in Myanmar because this study was conducted in a tertiary hospital, and convenience sampling was employed. Second, the behaviors of sodium consumption were self-reported by the participants. The researchers did not measure the actual level of sodium consumption. Last, this cross-sectional study cannot systematically evaluate the behavioral changes of the participants and may not provide causal inferences All these prescribed limitations provide an opportunity for future studies including longitudinal studies, studies conducted in other settings, and studies exploring other factors not examined in this study.

6. Conclusion

This study found that the sample of participants had quite favorable SCB. The influence of socio-demographic and clinical factors on SCB is highlighted. Non-dialysis CKD patients who took antihypertensive medication and had one or more comorbidities were more likely to have poorer SCB, whereas participants who had higher education and older age were more likely to display better SCB. Thus, the findings add to the body of nursing knowledge in Myanmar. Healthcare providers should pay more attention to patients having these characteristics to improve SCB, resulting in decreased progression of CKD. In the future, healthcare providers, including nurses, should encourage low sodium intake when preparing foods and reading nutrition labels on food packaging. There should be a study about SCB in other healthcare settings in Myanmar. In addition, it is recommended to do further research about SCB in non-dialysis CKD by following patients over an extended period. Moreover, future studies should be conducted in other settings to be more generalizable.

Acknowledgment

The principal investigator would like to convey sincere thanks to Faculty of Nursing, Mahidol University for giving an opportunity to study in the Master of Nursing Science Program (International Program) and Mahidol Postgraduate Scholarship for awarding a scholarship to study in this program.

Author contribution

KTH established the study, implemented statistical analysis, and processed the manuscript. AS contributed to the design of the study. AS and WP examined the data and assisted in manuscript revision. KTH also reanalyzed and interpreted the data according to the supervisions, guidance, and suggestions of AS and WP in every aspect of this study. All authors have read and approved the final manuscript.

Conflict of interest

All authors have no conflict of interest in this work.

References

Akbarpour, S., Khalili, D., Zeraati, H., Mansournia, M. A., Ramezankhani, A., & Fotouhi, A. (2018). Healthy lifestyle behaviors and control of hypertension among adult hypertensive patients. *Scientific Reports*, *8(1),* 8508. https://doi.org/10.1038/s41598-018-26823-5

Alexander, S., Jasuja, S., Gallieni, M., Sahay, M., Rana, D. S., Jha, V., Verma, S., Ramachandran, R., Bhargava, V., Sagar, G., Bahl, A., Mostafi, M., Pisharam, J. K., Tang, S. C. W., Jacob, C., Gunawan, A., Leong, G. B., Thwin, K. T., Agrawal, R. K., ... & Vachharajani, T. (2021). Impact of national economy and policies on end-stage kidney care in South Asia and Southeast Asia. *International Journal of Nephrology*, 2021, 6665901. https://doi.org/10.1155/2021/6665901

Ameh, O. I., Ekrikpo, U., Bello, A., & Okpechi, I. (2020). Current management strategies of chronic kidney disease in resource-limited countries. *International Journal of* Nephrology *and Renovascular Disease*, *13*, 239–251. https://doi.org/10.2147/IJNRD.S242235

Aparna, P., Salve, H., Krishnan, A., Lakshmy, R., Gupta, S., & Nongkynrih, B. (2021). Methods of dietary sodium estimation. *Indian Journal of Medical Specialities, 12(4),* 183-187. https://doi.org/10.4103/injms.injms_97_21

Aziz, N. S. A., Ambak, R. Othman, F., He, F. J., Yusof, M., Paiwai, F., Ghaffar, S. A., Yusof, M. F. M., Cheong, S. M., MacGregor, G., & Aris, T. (2021). Risk factors related with high sodium intake among Malaysian adults: Findings from the Malaysian community salt survey (MyCoSS) 2017-2018. *Journal of Health, 40(1)*, 14. http://doi.org/10.1186/s41043-021-00233-2

Bello, A. K., Alrukhaimi, M., Ashuntantang, G. E., Basnet, S., Rotter, R. C., Douthat, W. G., Kazancioglu, R., Köttgen, A., Nangaku, M., Powe, N. R., White, S. L., Wheeler, D. C., & Moe, O. (2017). Complications of chronic kidney disease: Current state, knowledge gaps, and strategy for action. *Kidney International Supplements*, *7*(2), 122–129. https://doi.org/10.1016/j.kisu.2017.07.007

Braun, M. M., & Khayat, M. (2021). Kidney disease: End-stage renal disease. *Family Physician Essentials*, *509*, 26–32. https://pubmed.ncbi.nlm.nih.gov/34643362/

Brouillard, A. M., Kraja, A. T., & Rich, M. W. (2019). Trends in dietary sodium intake in the United States and the impact of USDA guidelines: NHANES 1999-2016. *The American Journal of Medicine*, *132*(10), 1199–1206.e5. https://doi.org/10.1016/j.a mjmed.2019.04.040

Burnier, M., Paccaud, F. M., & Bochud, M. (2020). Clinical profiles and factors associated with a low sodium intake in the population: An analysis of the Swiss survey on salt. *Nutrients, 12(11)*, 3591. https://doi.org/10.3390/nu12113591

Centers for Disease Control and Prevention (CDC). (2021). *Chronic kidney disease in the United States*. US Department of Health and Human Services. https://www.cdc.gov/kidneydisease/publications-resources/ckd-national-facts.html

Chailimpamontree, W., Kantachuvesiri, S., Aekplakorn, W., Lappichetpaiboon, R., Thonkanit, N. S., Vathesatogkit, P., Kunjang, A., Boonyagarn, N., Sukhonthachit, P., Chuaykarn, N., Sonkhammee, P., Khunsaard, P., Nuntapanich, P., Charoenbut, P., Thongchai, C., Uttarachai, A., Kwankhoom, W., Rattanakanahutanon, F., Ruangchai, K., Yanti, N., Sasang, N., Bunluesin, S., & Garg, R. (2020). Estimated dietary sodium intake in Thailand: A nationwide population survey with 24-hour urine collections. *Journal of Clinical Hypertension, 23*, pp.744-754. http://doi.org/10.111/jch.14147

Chan, C. T., Blankestijn, P. J., Dember, L. M., Gallieni, M., Harris, D. C. H., Lok, C. E., Mehrotra, R., Stevens, P. E., Wang, A. Y.-M., Cheung, M., Wheeler, D. C., Winkelmayer, W. C., Pollock,

C. A., Abu-Alfa, A. K., Bargman, J. M., Bleyer, A. J., Brown, E. A., Davenport, A., Davies, S. J., ... & Zakha rova, E. (2019). Dialysis initiation, modality choice, access, and prescription: Conclusions from a kidney disease improving global outcomes (KDIGO) controversies conference. *Kidney International, 96 (1),* 37–47. https://doi.org/10.1016/j.kint.2019.01.017

Cho, H., Kim, S. M., Jeong, S. S., & Kim, S. B. (2016). Comparison of salt taste thresholds and salt usage behaviors between adults in Myanmar and Korea. *Asia Pacific Journal of Clinical Nutrition, 25(4),* 879–884. https://doi.org/10.6133/apjcn.092015.32

Cockwell, P., & Fisher, L. A. (2020). The global burden of chronic kidney disease. *The Lancet, 395(10225),* 662–664. https://doi.org/10.1016/s0140-6736(19)32977-0

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. (2nd ed.). Routledge. https://doi.org/10.4324/9780203771587

Delia, L., Brajovic, M., Klisic, A., Breda, J., Jewell, J., Cadjenovic, V., & Cappuccio, F. P. (2019). Sodium and potassium intake, knowledge attitudes and behaviors towards salt consumption amongst adults in Podgorica, Montenegro. *Nutrients, 11(1),* 160. http://doi.org/10.3390/nu11010160

Hong, J. W., Noh, J. H., & Kim, D. J. (2016). Factors associated with high sodium intake based on estimated 24-hour urinary sodium excretion: The 2009-2011 Korea national health and nutrition examination survey. *Medicine, 95(9),* e2864. https://doi.org/10.1097/MD.0000000000002864

Jessen, N., Santos, A., Damasceno, A., Silva-Matos, C., Severo, M., Padrao, P., & Lunet, N. (2018). Knowledge and behaviors regarding salt intake in Mozambique, *European Journal of Clinical Nutrition, 72,* 1690-1699. https://doi.org/10.1038/s41430-018-0125-y

Johnson, C., Santos, J. A., Sparks, E., Raj, T. S., Mohan, S., Garg, V., Rogers, K., Maulik, P. K., Prabhakaran, D., Neal, B., & Webster, J. (2019). Sources of dietary salt in north and south India estimated from 24-hour dietary recall. *Nutrients, 11(2),* 318. https://doi.org/10.3390/nu11020318

Kaesler, N., Baid-Agrawal, S., Grams, S., Nadal, J., Schmid, M., Schneider, M. P., Eckardt, K.-U., Floege, J., Bergmann, M. M., Schlieper, G., & Saritas, T. (2021). Low adherence to CKD-specific dietary recommendations associates with impaired kidney function, dyslipidemia, and inflammation. *European Journal of Clinical Nutrition, 75 (9), 1389*–1397. https://doi.org/10.1038/s41430-020-00849-3

Kaze, A. D., Ilori, T., Jaar, B. G., & Echouffo-Tcheugui, J. B. (2018). Burden of chronic kidney disease on the African continent: A systematic review and meta- analysis. *Biomedical Central Nephrology, 19,* 125. https://doi.org/10.1186/s12882-018-0930-5

Kelly, J. T., Su, G., Zhang, L., Qin, X., Marshall, S., González-Ortiz, A., Clase, C. M., Campbell, K. L., Xu, H., & Carrero, J. J. (2021). Modifiable lifestyle factors for primary prevention of CKD: A systematic review and meta-Analysis. *Journal of the American Society of Nephrology, 32(1),* 239-253. https://doi.org/10.1681/asn.2020030384

Kidney Disease Improving Global Outcomes (KDIGO) CKD Work Group. (2013). KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. *Kidney International Supplements 3(1),* 1-150. https://doi.org/10.1038/kisup.2012.77

Ko, J., Kim, K. B., Timmerman, G. M., Clark, A. P., & Kim, M. (2018). Factors predicting sodium intake of Korean Americans with type 2 diabetes. *Journal of Immigrant and Minority Health, 20(3),* 641–650. https://doi.org/10.1007/s10903-017-0602-8

Lin, Y., Mei, Q., Qian, X., & He, T. (2020). Salt consumption and the risk of chronic diseases among Chinese adults in Ningbo city. *Nutrition Journal, 19(9).* http://doi.org/10.1186/s12937-020-0521-8

Mestral, C. D., Mayén, A. L., Petrovic, D., Marques-Vidal, P., Bochud, M., & Stringhini, S. (2017). Socioeconomic determinants of sodium intake in adult populations of high-income countries: A systematic review and meta-analysis. *American Journal of Public Health, 107(4),* e1–e12. https://doi.org/10.2105/AJPH.2016.303629

Meuleman, Y., Hoekstra, T., Dekker, F. W., Van Der Boog, P. J. M., & Van Dijk, S. (2018). Perceived sodium reduction barriers among patients with chronic kidney disease: Which barriers are important and which patients experience barriers? *International Journal of Behavioral Medicine, 25(1),* 93–102. https://doi.org/10.1007/s12529-017 -9668-x

Mon, E. S., Sriyuktasuth, A., & Phligbua, W. (2022). Blood pressure control and its determinants among patients with non-dialysis chronic kidney disease in Myanmar. *Nurse Media Journal of Nursing, 12(1),* 1-12. http://doi.org/10.14710/nmjn.v12i1.42659

Nerbass, F., Silva, V., C., & Filho, R., P. (2018). Sodium intake and blood pressure in patients with chronic kidney disease: A salty relationship. *Blood Purification, 45,* 166-172. https://doi.org/10.11 59/000485154

Neupane, D., Rijal, A., Henry, M. E., Kallestrup, P., Koirala, B., Mclachlan, C. S., Ghimire, K., Zhao, D., Sharma, S., Pokharel, Y., Joseph, K., Olsen, M. H., Schutte, A. E., & Appel, L. J. (2020). Mean dietary salt intake in Nepal: A population survey with 24-hour urine collections. *The Journal of Clinical Hypertension, 22(2),* 273–279. https://doi.org/10.1111/jch.13813

Niyomchit, C., Aekwarangkoon, S., Noonil, N., & Jantasuwan, R. (2019). Relationship between sodium consumption behavior and kidney function in diabetes patients with chronic kidney disease. *Journal of Nursing, 39(3),* 103-114. https://he02.tci-thaijo.org/in dex.php/nur-psu/article/view/218962

Petersen, K. S., Malta, D., Rae, S., Dash, S., Webster, J., McLean, R., Thout, S. R., Campbell, N. R. C., & Arcand, J. (2020). Further evidence that methods based on spot urine samples should not be used to examine sodium-disease relationships from the science of salt: A regularly updated systematic review of salt and health outcomes. *The Journal of Clinical Hypertension, 22(10),* e13958. https://doi.org/10.1111/jch.13958

Piaseu, N., Boonsiri, C., Panichkul, K., Maruo, S. J., Putwatana, P., & Kantachuvesiri, S. (2020). Effects of program promoting food consumption for sodium reduction on knowledge, sodium consumption behaviors, and urinary sodium in nursing students: A multi-setting study. *Bangkok Medical Journal, 16(1),* 1-6. https://doi.org/10.31524 /bkkmedj.2020.11.009

Reyhani, P., Azabdaftari, F., Ebrahimi-Mamagani, M., Asghari-Jafarabdi, M & Shokrvash, B. (2020). The predictors of high dietary salt intake among hypertensive patients in Iran. *International Journal of Hypertension*, 6748696. https://doi.org/10.1155/2020/6748696

Saah, F. I., Amu, H., Seidu, A., & Bain, L. E. (2021). Health knowledge and care seeking behavior in resource-limited settings amidst the covid-19 pandemic: A qualitative study in Ghana. *Public Library of Science, 16(5),* e0250940. https://doi.org/10.1371/journal.pone.0250940

Santin, F., Canella, D. S., Avesani, C. M. (2018). Food consumption in chronic kidney disease: Association with sociodemographic and geographical variables and comparison with healthy individuals. *Journal of Renal Nutrition, 29(4),* 333-342. https://doi.org/10.1053/j.jrn.2018.10.010

Singh, M., & Krause, M. W. (2021). *BMJ Best Practice: Chronic kidney disease follow up,* p.59-60. BMJ Publishing group.

Smith, J. L., Lennie, T. A., Chung, M. L. & Mudd-Martin, G. (2019). Dietary sodium intake is predicted by anti-hypertensive medication regimen in patients with heart failure. *Journal Cardiovascular Nursing, 34(4),* 313-318. https://doi.org/10.1097/JCN.0000000000000570

Welsh, C. E., Welsh, P., Jhund, P., Delles, C., Celis-Morales, C., Lwesey, J. D., Grey, S., Lyall, D., Iliodromiti, S., Gill, J. M. R., Sattar, N. & Mark, P. B. (2019). Urinary sodium excretion, blood pressure and risk of future cardiovascular disease and mortality in subject without prior cardiovascular disease. *Journal of Hypertension, 73,* 1202-1209. https://doi.org/10.1161/hypertensionaha.119.12726

Wicaksana, A. L., Yen, M., Wang, S. T., & Fetzer, S. J. (2021). Determinants of high-sodium food intake among Indonesian patients with hypertension. *The Journal of Cardiovascular Nursing, 36(6),* 582–588. https://doi.org/10.1097/JCN.0000000000000743

World Health Organization (WHO). (2020). *WHO Myanmar newsletter, 63(17),* 1-4. https: //cdn.who.int/media/docs/default-source/searo/Myanmar/newsletter-issue-63-v0ol-17_ 6ab56098-bb9b-4448-a3eb-56dfe53c8a7d.pdf?sfvrsn=45 457814-2

Nurse Media
JOURNAL OF NURSING

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):40-52, April 2024
https://doi.org/10.14710/nmjn.v14i1.54040

ORIGINAL RESEARCH

The Association of Nurse Burnout with Patient Satisfaction from Nurse Perspective Mediated by Nurse Job Satisfaction and Caring Behavior

Ferdi Antonio[1], Andy Andy[2], Jevany M. Claudia Moksidy[1]

[1]*Department of Hospital Administration, Faculty of Economics and Business, Universitas Pelita Harapan, South Jakarta, Indonesia*
[2]*Department of Anesthesiology and Intensive Care, Pondok Indah Hospital, South Jakarta, Indonesia*

Article Info

Article History:
Received: 3 May 2023
Revised: 21 April 2024
Accepted: 22 April 2024
Online: 30 April 2024

Keywords:
Caring behavior; COVID-19; job satisfaction; nurse burnout; patient satisfaction

Corresponding Author:
Andy Andy
Department of Anesthesiology and Intensive Care, Pondok Indah Hospital, Jakarta, Indonesia
Email: andybai78@gmail.com

Abstract

Background: The COVID-19 pandemic represents a substantial threat to world health, economic stability, and civilization in general. In the COVID-19 era, health workers, particularly frontline nurses, face increasing pressure which further affects patient satisfaction. However, empirical studies that connected burnout, job satisfaction, and caring behavior toward patient satisfaction from the nurses' point of view are still scarce.

Purpose: This study aimed to explore the relationship between nurse burnout with patient satisfaction mediated by work satisfaction and nurse caring behavior at a private COVID-19 referral hospital from the nurses' perspective.

Methods: A quantitative survey with a cross-sectional approach was conducted from March to April 2021 to test the framework on the population obtained from full-time nurses who worked at a private COVID-19 referral hospital in Manado, North Sulawesi, Indonesia. The researcher analyzed the empirical data generated from purposive sampling resulting in 170 eligible respondents. Data were collected through a self-completed online questionnaire with the Likert scale. The data analysis deployed the PLS-SEM approach.

Results: The findings indicate that nurse burnout is associated significantly ($p<0.05$ and CI 95%) with the delivery of patient satisfaction from the nurses' perspective, mediated by job satisfaction and nurses' caring behavior. The mediation relationship was found with $\beta=0.021$, while the direct relation from caring behavior to patient satisfaction was $\beta=0.277$ and from job satisfaction was $\beta=0.582$. The proposed model demonstrated adequate prediction of patient satisfaction as the dependent variable ($R^2=0.633$).

Conclusion: This study concluded that nurse burnout which consists of three dimensions mediated by job satisfaction and caring behavior had an association with patient satisfaction. Increased burnout will result in decreased job satisfaction and caring behavior. This study provides suggestions to the hospital manager to improve the quality of care by understanding nurse burnout and preventing it.

How to cite: Antonio, F., Andy, A., & Moksidy, J. C. (2024). The association of nurse burnout with patient satisfaction from nurse perspective mediated by nurse job satisfaction and caring behavior. *Nurse Media Journal of Nursing, 14*(1), 40-52. https://doi.org/10.14710/nmjn.v14i1.54040

1. Introduction

The coronavirus disease 2019 (COVID-19), which was initially found in Wuhan, China, spread rapidly around the world, raising worries about the safety of front-line healthcare personnel (WHO, 2020). Numerous measures have been taken to disrupt the disease's chain of transmission, one of which is the deployment of frontline health personnel such as physicians and nurses around the region (De Los Santos & Labrague, 2021). In this condition, nurses have serious psychological and mental difficulties, which can result in mental tiredness, decreased productivity, job errors, and a lack of focus when dealing with patients. The second wave of COVID-19 is currently sweeping the world, and the number of nurses in danger of burnout is increasing in health institutions (Garcia & Calvo, 2020).

It was estimated that 83% of health professionals in Indonesia experience moderate to severe burnout, which has impacted the workforce's life and psychological productivity (Humas FKUI, 2020). Additionally, it was discovered that frontline medical staff was twice as likely to develop burnout during the COVID-19 pandemic (Asif et al., 2019; Regina et al., 2021). To avoid or minimize burnout, it is critical to assess and monitor the work environment, identify problems, and take preventative action (Altinoz, 2016; Babapour et al., 2022; De Los Santos & Labrague, 2021). Burnout is a psychological condition described as a negative emotional response to work as a result of a prolonged stressful work environment (Galanis et al., 2021). To avoid or minimize burnout, it is critical to assess and monitor the work environment, identify problems, and take preventative action (Altinoz, 2016; De Los Santos & Labrague, 2021).

The Maslach Burnout Inventory was used to determine burnout (MBI). The MBI evaluates three dimensions of burnout: emotional weariness, depersonalization, and diminished sense of achievement (García & Calvo, 2012). Burnout results in decreased motivation, decreased productivity, and increased negative attitudes and actions at work (Andy et al., 2022; Raudenská et al., 2020). These three factors can contribute to patient dissatisfaction with medical care. Nursing burnout from work-related stress has a detrimental impact on nurses' quality of life and health. It may also overshadow nursing performance and diminish nursing care behaviors, which could be a contributing cause to patient satisfaction (Babapour et al., 2022).

Patient satisfaction is a generally accepted predictor of the quality of medical services and a positive indicator of a variety of factors, including patient compliance with treatment, malpractice claims, hospital personnel job satisfaction, and financial success (Garrosa et al., 2011; Tervo-Heikkinen et al., 2008). Patients are generally unlike the customer due to their emotional, psychological, and physical characteristics. They require both care and satisfaction. Meanwhile caring conduct refers to the physical and emotional components of nursing care delivered to patients. In this study, patient satisfaction was measured through the perspective of nurses who interact with patients, this is following previous research (Topaz et al., 2016).

There are several empirical research on the mental health of clinical healthcare professionals during the COVID-19 pandemic (Jason & Antonio, 2021; Jun et al., 2021; Regina et al., 2021). However, limited were focus on nurse caring behavior and its impact on patient satisfaction although it is a crucial factor in the quality of care (Kibret et al., 2022). Nursing is affected by hospital nurses' capacity to offer great care while managing stress at work (Adella et al., 2024; Jun et al., 2021). Therefore, understanding patient satisfaction from the nurse's perspective who is directly involved in the front line of service should be done before the management initiative on service improvement. The purpose of this study was to identify the association of nurse burnout with patient satisfaction mediated by nurse job satisfaction and caring behavior in a private COVID-19 referral hospital during the pandemic, as well as the impact on patients. The findings of this study may help to a better understanding of nurses' views of caring behavior and job satisfaction, which may influence hospital delivery of care. In that regard, it is due to hospital management's ability to resolve this issue in the future.

2. Methods

2.1. Research design

This is a quantitative survey following a cross-sectional design with hypothesis tests on the relation between variables in the model. This study is non-interventional and has no treatment for the subjects. The conceptual framework was developed from the previous study by Jun et al. (2021), Rego et al. (2010), and Weng et al. (2011). The variables related to this study were nurse burnout (NB, including emotional exhaustion [EE], depersonalization [DP], and personal accomplishment [PA]), nurse job satisfaction (JS), nurse caring behavior (CB), and patient satisfaction (PS), which were the parameters. The description of the association is illustrated as the conceptual framework shown in Figure 1, with the proposed hypotheses listed below.

H1: Nurse burnout has a negative association with nurse job satisfaction.
H2: Nurse burnout has a negative association with nurse caring behavior.
H3: Nurse job satisfaction has a positive association with nurse caring behavior.
H4: Nurse job satisfaction has a positive association with patient satisfaction.
H5: Nurse caring behavior has a positive association with patient satisfaction.

2.2. Setting and samples

The analysis unit is an individual analysis unit, which means the data obtained from individuals on each respondent report (Bougie & Sekaran, 2020). Since the scope of this study is the nurse perspective following the previous studies (Topaz et al., 2016), the chosen population was full-time nurses who worked at the hospital, taking care of suspected or confirmed COVID-19 patients during 2021 and working for more than a year in the hospital. The main criteria that needed to be fulfilled for respondents were a permanent or full-time nurse, and providing service during the pandemic. The nurses who were sick at the time the questionnaire was distributed were excluded. Nurses were reasonably chosen as an analysis unit because they interact more with COVID-19 patients compared to other health workers. The study is based on a private COVID-19 referral hospital in Manado, North Sulawesi, Indonesia, that has been treating COVID-19 patients since the pandemic started.

Respondents were chosen using the purposive sampling method. The respondents were obtained from March to April 2021 during the COVID-19 pandemic. A number of 170 respondents fulfilled the requirements and this amount met the naive criteria of the 160 minimum sample requirement based on guidance for analysis with partial least squares structural equation modeling (PLS-SEM) with inverse square root calculation (Kock & Hadaya, 2018).

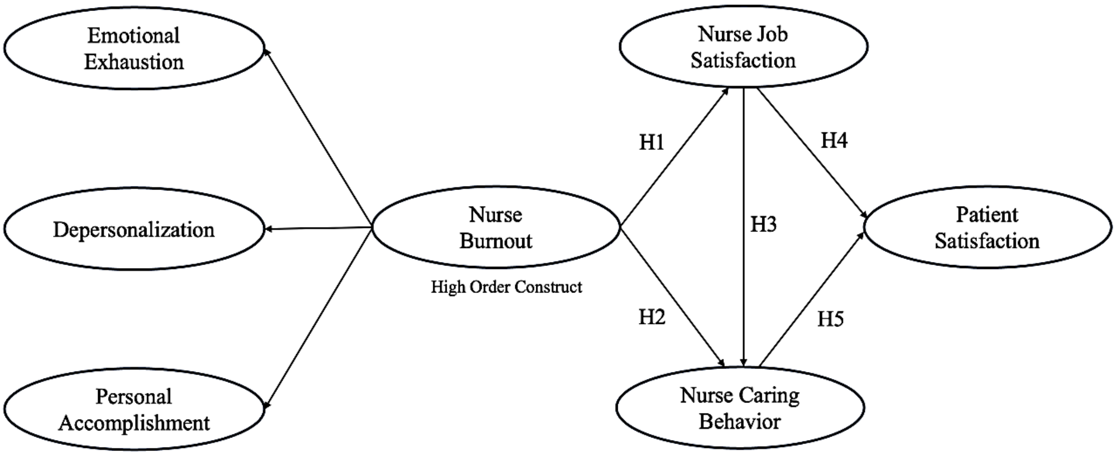

Figure 1. Conceptual framework

2.3. Measurement and data collection

This survey used the Likert scale from 1 (strongly disagree) to 5 (strongly agree) to determine the variants between components and facilitate data report conversion from the respondents into number format. The scale instrument to measure the latent variable was developed from previous studies (see Table 2). The burnout instrument was adapted from García & Calvo (2020), while job satisfaction was adapted from Giacopelli et al. (2013), and caring behavior from Rego et al. (2010). Patient satisfaction from a nurse perspective was adapted from Cleven et al. (2016). The instrument was translated into Indonesian by a linguist and then underwent face validity consisting of five experts. In content validity, the Aiken value was found to be above 0.6 for all instrument items so it was said to be adequate. Several question sentences were revised after face validity was carried out to make them easier for respondents to understand. In addition, the item content validity index (I-CVI) met the average value of 4 from the five experts.

Data were obtained by a self-completed online questionnaire. It was done by sending a link to an online questionnaire to all respondents who fulfilled the previously determined criteria. In distributing this questionnaire, coordination was carried out with hospital management to ensure that the questionnaire was filled in by the right person.

2.4. Data analysis

This study employed a hierarchical component with a reflective-reflective measurement (dimension) for nurse burnout. The overall model included four variables, namely nurse burnout, nurse job satisfaction, nurse caring behavior, and patient satisfaction, and three burnout dimensions, which were emotional exhaustion, depersonalization, and personal accomplishment. Data were analyzed using the PLS-SEM method due to the complex structural model with many indicators and paths in the model. Furthermore, this was also an explorative and predictive-oriented study that gives insight and predictive ability for further development (Hair et al., 2019).

The PLS-SEM analysis was applied through SmartPLS™ version 3.3.8 (SmartPLS GmbH, Oststeinbek, Germany), which was selected as it provides a bootstrapping menu to test significance (Memon et al., 2021). Two types of models analyzed by PLS-SEM were the outer and inner models. The outer model tested the relationship between indicators and construct variables to establish reliability and validity while the inner model or structural model provided the relationship between constructs in the study model. Before filling out the questionnaire each respondent was given informed consent. Respondents were given clear information that this study was voluntary and anonymous.

2.5. Ethical considerations

This study was approved by the Institutional Review Board (IRB) of Universitas Pelita Harapan with a reference number 048/MARS-FEB-UPH/II/2021. Before filling out the questionnaire, potential respondents were informed in writing that this questionnaire was voluntary and anonymous and the confidentiality of data from respondents would be treated as well. Informed consent was obtained from all respondents.

3. Results

3.1. Respondents' characteristics

Out of 170 respondents who fulfilled the study criteria, such respondents were full-time nurses who worked during the pandemic. The 132 respondents were women and 38 were men. The majority of the respondents were in the 21-30 years age group, who were categorized as young nurses within the age distribution between 21 to 50 years old. Overall, 170 respondents had a proper education, where 45.89% of respondents finished their nurse professional education, and 34.12% graduated with a diploma in nursing. With this educational background, the respondents were considered a match for the purpose of the nursing study sampling. Most respondents worked in the inpatient ward, which can be related to the caring level of the nurses, especially for hospitalization. In addition, 75% of respondents have been confirmed infected with COVID-19. The following describes the respondents' profiles in this study (Table 1).

Table 1. Respondents' characteristics

Characteristics		f	%
Gender	Male	38	22.36
	Female	132	77.64
Age	21-30 years	125	73.53
	31-40 years	38	22.36
	41-50 years	7	4.11
	>50 years	0	0
Education	Nursing school or equivalent	0	0
	D3 nursing (3-year diploma)	58	34.12
	D4 nursing (4-year diploma)	5	2.94
	S1 nursing (undergraduate)	29	17.05
	Nurse profession	78	45.89
Length of work in the hospital	<1 year	0	0
	1-2 years	138	81.18
	3-4 years	32	18.82
	>4 years	0	0
Department	Outpatient	15	8.90
	Inpatient	77	45.30
	Emergency	41	24.10
	ICU	8	4.70
	Operating theatre	29	17.00
History of confirmed COVID-19	Yes	128	75.00
	No	42	25.00

3.2. Descriptive score of variables

From the survey results, the average value on a scale of 1 to 5 for the patient satisfaction variable was 4.239 (SD=0.679) with a minimum observed of 3 and a maximum of 5, so it can be interpreted that the majority of respondents felt they had provided services to patient satisfaction. For the caring behavior variable, the average value is 4.225 (SD=0.623) while for job satisfaction it is 4.023 (SD=0.712). For the dimensions of burnout, the mean value of personal accomplishment is 3.620 (0.811) depersonalization 3.667 (SD=0.783), and emotional exhaustion 3.797 (SD=0.765). The highest mean score is from personal exhaustion and this shows the condition of nurses when working to serve patients in the pandemic era.

3.3. Reliability and validity of the instrument

Based on the results of the outer model in the PLS-Algorithm, 21 reflective indicators of variables had an outer loading of more than 0.70 as required. Several indicators with an outer loading value of < 0.7 were deemed invalid, so they had to be eliminated from further analysis. Indicators that were taken out include EE3, EE5, and EE6 from the emotional exhaustion variable; indicators DP3, and DP4 from the depersonalization variable; indicator PA3 from the personal accomplishment variable; indicators JS5, JS6, JS7, and JS8 from the job satisfaction variable; indicator CB4, CB5, CB6, and CB7 from the caring behavior variable; and indicator PS5, PS6 from the patient satisfaction variable. After the elimination, it can be seen in Table 2, that the 21 indicators had an outer loading greater than 0.70. Thus, all reflective indicators in this study were reliable in measuring their constructs.

Table 2. Construct reliability and validity

Variables	Indicators		Outer Loading	CA	CR	AVE
Emotional Exhaustion	EE1	I feel my emotions drain because of work.	0.894	0.875	0.923	0.800
	EE2	I feel very tired at the end of the working day.	0.908			
	EE4	I often feel frustrated with this job.	0.881			
Depersonalization	DP1	I often treat patients as if they were just objects.	0.860	0.818	0.892	0.736
	DP2	I often become insensitive to other people because of this workload.	0.941			
	DP5	I feel that patients often blame me for their problems.	0.763			
Personal Accomplishment	PA1	I can easily understand how patients feel about the things they want.	0.891	0.914	0.940	0.795
	PA2	I feel I can resolve patient complaints effectively.	0.887			
	PA4	I feel passionate about doing my job serving and helping patients.	0.904			
	PA5	I tend to easily create a comfortable atmosphere with patients.	0.886			
Job Satisfaction	JS1	I feel satisfied when I can complete the task in accordance with the allotted time.	0.832	0.810	0.876	0.639
	JS2	I feel satisfied when given a task according to my abilities.	0.792			
	JS3	I feel satisfied when my work is better than before.	0.864			
	JS4	I feel satisfied when my work performance is recognized by the supervisor.	0.700			
Caring Behavior	CB1	I treat patients humanely and show concern for patients' complaints.	0.914	0.864	0.917	0.786
	CB2	I show that I am there when the patient needs me.	0.900			
	CB3	I often ask patients how they would like to be treated.	0.845			
Patient Satisfaction	PS1	Patients feel that they are sufficiently informed about their treatment process by the doctor.	0.902	0.891	0.924	0.754
	PS2	Patients feel that they are getting health services according to their expectations.	0.861			
	PS3	Patients feel that they get good communication from the medical staff.	0.894			
	PS4	Patients receive quality medical services according to their needs.	0.813			

Notes: EE: Emotional Exhaustion; DP: Depersonalization; PA: Personal Accomplishment; JS: Job Satisfaction; CB: Caring Behavior; PS: Patient Satisfaction; CA: Cronbach's Alpha; CR: Composite Reliability; AVE: Average Variance Extracted

Nurse burnout consists of three dimensions, which are emotional exhaustion, depersonalization, and personal accomplishment. Based on Table 2. above, the assessment for emotional exhaustion, depersonalization, and personal accomplishment was reliable by observing the outer loading of the respective indicator.

Aside from outer loading, reliability needs to be tested by measuring construct reliability (Cronbach's alpha and composite reliability). Further the validity test through the Average Variance Extracted (AVE), and discriminant validity through the Heterotrait-Monotrait (HTMT) ratio as suggested by Hair et al. (2019). Table 2 described that Cronbach's alpha value of all constructs was higher than 0.7 and the composite reliability value had fulfilled the requirement for composite reliability criteria less than 0.95. To determine reliability, all variables should have a value of 0.7 to 0.95. Therefore, it could be said that all indicators were reliable to measure its construct respectively. The results show that each construct has an AVE value of more than 0.50, thus the indicators are valid to measure the construct.

The discriminant validity test with the result in Table 3 was aimed to determine the match of the indicators and the construct across the model. Discriminant validity was measured from the cross-loading value between each variable. If the correlation between variables and indicators is higher than the correlation between a variable and another variable, then the variable is said to be able to predict its indicator better than other variables (Hair et al., 2019). The data above provided an HTMT ratio which is known as more precise to gain the discriminant validity. It was found each variable was under 0.9, except for nurse burnout on emotional exhaustion and depersonalization which cannot be established. This is because the burnout variable was tested with the repeated indicator approach to test the dimension, whereas the same indicators were used in the three dimensions and variables. It can be concluded that all model indicators have been well discriminated and can measure their construct.

Table 3. Discriminant validity

Variables	CB	DP	EE	JS	NB	PS	PA
Caring Behavior	1						
Depersonalization	0.711	1					
Emotional Exhaustion	0.622	0.653	1				
Job Satisfaction	0.792	0.808	0.692	1			
Nurse Burnout	0.725	*0.844*	*1.020*	0.754	1		
Patient Satisfaction	0.743	0.807	0.784	0.886	0.865	1	
Personal Accomplishment	0.678	0.729	0.806	0.627	*1.002*	0.769	1

Notes: CB: Caring Behavior; DP: Depersonalization; EE: Emotional Exhaustion; JS: Job Satisfaction; NB: Nurse Burnout; PS: Patient Satisfaction; PA: Personal Accomplishment

3.4. Structural model analysis

To assess the multicollinearity problems between variables in this model and the common method bias probability, the inner variance inflation factor (VIF) was used with a result of lower than 5 in all variables. From the VIF result it can be concluded that all variables in this study model had an ideal inner VIF and therefore no multicollinearity issue was found in the model. The explanatory and predictive ability of this model was tested using R^2 and Q^2_*predict* as recommended (Hair et al., 2019; Sarstedt et al., 2017, 2022). The test showed that patient satisfaction has $R^2=0.633$, which was categorized as moderate to strong predictive accuracy. Patient satisfaction is a dependent variable that could be explained by 63.3% of the variables in the model and 36.7% by other variables outside this model.

To determine the predictive ability of this model, the authors conducted a blindfolding procedure (Hair et al., 2017, 2019). The Q^2 (predictive relevance) value between 0 to 0.25 can be considered to have a medium predictive relevance. A Q^2 value of more than 0.5 is considered to have a large predictive relevance. The higher the Q^2 value, the higher the ability of a variable to predict (Hair et al., 2019). In this study, the patient satisfaction variable had a medium predictive relevance with a Q^2 value of 0.460 and a Q^2_*predict* of 0.568 and was considered adequate to predict patient satisfaction.

Out of five hypotheses tested on the nurses in this model, all were proven significant due to the T-statistic value >1.645 (one-tailed test with 0.05 alpha). Confidence interval within a positive range for H3, H4, and H5 with a lower limit of 5% and an upper limit of 95%. Meanwhile, the two H1 and H2 had negative confidence interval ranges were nurse burnout on job satisfaction and, nurse burnout on caring behavior, meaning the higher burnout the lesser job satisfaction and caring behavior. All five hypotheses in Table 4 had a valence standardized coefficient (β) which followed the directional hypothesis.

Table 4. Significance and coefficients

Hypothesis		Standardized Coefficient	T-statistics	5.0% CI	95.0% CI	P-Value	Result
H1	NB → JS	-0.667	16.350	-0.732	-0.599	0.000*	Hypothesis Supported
H2	NB → CB	-0.360	4.424	-0.504	-0.236	0.000*	Hypothesis Supported
H3	JS → CB	0.437	5.298	0.290	0.562	0.000*	Hypothesis Supported
H4	JS → PS	0.582	9.665	0.479	0.676	0.000*	Hypothesis Supported
H5	CB → PS	0.277	4.556	0.181	0.379	0.000*	Hypothesis Supported

*Sig. at $p \leq 0.05$; CI: Confidence Interval

A direct effect on patient satisfaction came from nurse job satisfaction and nurse caring behavior where nurse job satisfaction provided a larger effect on patient satisfaction. It also had a significant direct effect on nurse caring behavior. If nurse job satisfaction increases, then caring behavior and patient satisfaction will also increase. Job satisfaction most strongly affected caring behavior (β=0.437). The nurse burnout construct can be explained most strongly by the personal accomplishment dimension, followed by emotional exhaustion and depersonalization.

Every path to patient satisfaction indicated a significant relation in the indirect effect (Table 5). This showed that the two mediator factors played a significant role that needed to be considered in the process of providing patient satisfaction. The predominantly path was shown from nurse burnout to job satisfaction, and then to caring behavior. This result confirms the mediation effect of job satisfaction and caring behavior as well.

Table 5. Specific indirect effect test result

Path	Coefficients	T-statistics
Job Satisfaction → Caring Behavior → Patient Satisfaction	0.033	3.718
Nurse Burnout → Job Satisfaction → Patient Satisfaction	0.051	7.567
Nurse Burnout → Job Satisfaction → Caring Behavior	0.053	5.489
Nurse Burnout → Caring Behavior → Patient Satisfaction	0.037	2.668
Nurse Burnout → Job Satisfaction → Caring Behavior → Patient Satisfaction	0.021	3.842

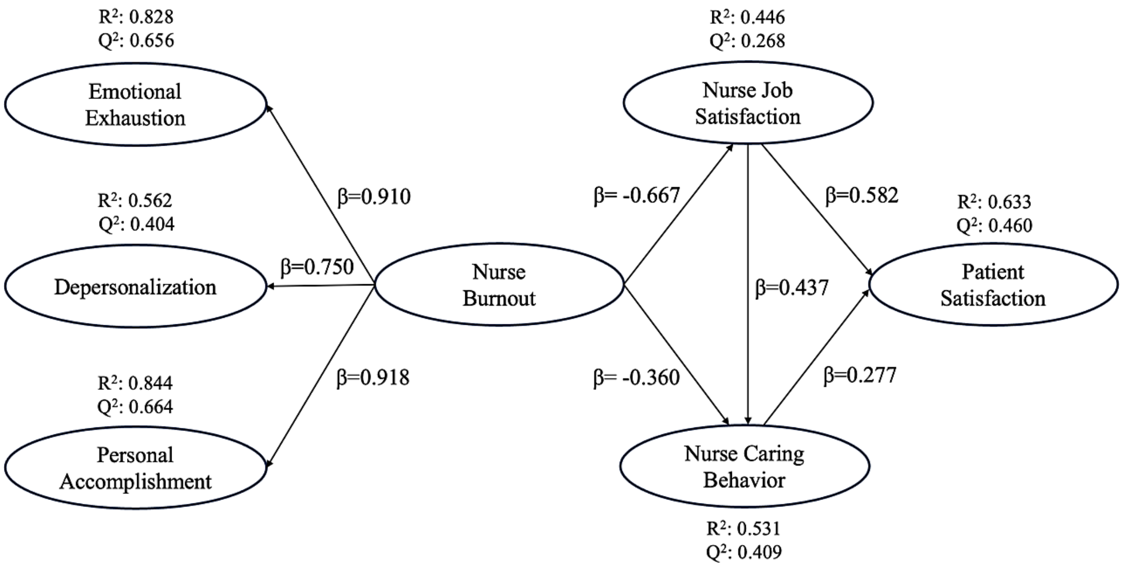

Figure 2. Research result model

3.5. Importance-Performance Map Analysis

The advanced analysis was through the Importance-Performance Map Analysis (IPMA), which is an approach used to obtain two-dimensional input, this is through the descriptive mean score of each variable and important score, measured by total effect. The importance and performance analysis focused on the effect of the dependent variable as the target in the study model (Hair et al., 2019; Ringle & Sarstedt, 2016). The interpretation of this map image is that the more the indicator plot is positioned to the right, the more important it is in the eyes of the respondent. The higher the indicator plot, the better the actual condition from the respondent's perspective. Management needs to focus on indicators that are important from the respondent's perspective but do not yet show good conditions.

Figure 3 depicted that job satisfaction indicators 2, 3, and 4 can be seen on the upper right of the figure therefore need to be prioritized by the hospital management to improve patient satisfaction in the hospital. However, JS1 consists of the item "I feel satisfied when I can complete the task per the allotted time" which shows lesser performance in the mapping and subsequently in the area of improvement.

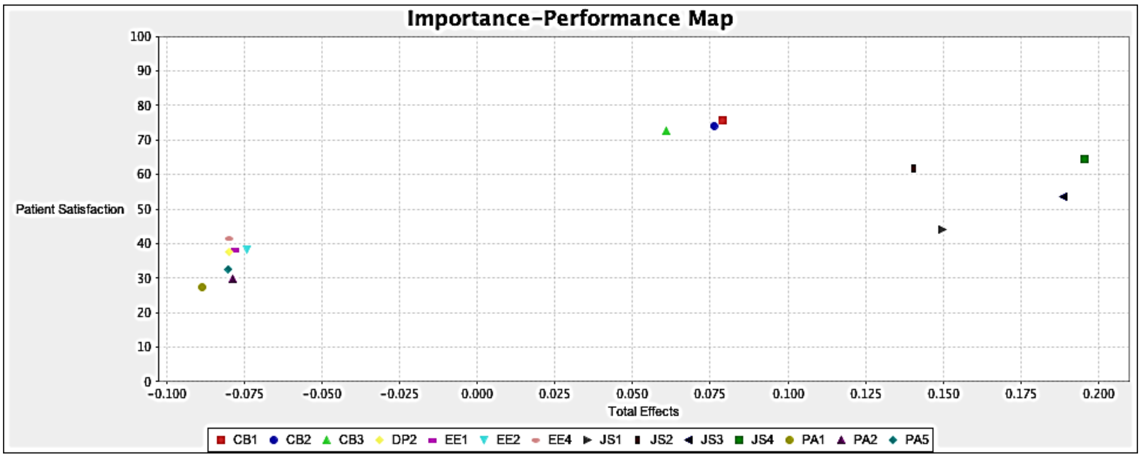

Figure 3. IPMA Indicators

4. Discussion

This study aimed to determine how nurse burnout affected patient satisfaction through the mediation of job satisfaction and caring behavior. The findings of this study showed a significant negative relationship with nurse burnout. If nurse burnout increases, then job satisfaction, caring behavior, and patient satisfaction will decrease. This was in line with previous studies by Jason & Antonio (2021), and Jun et al. (2021). Therefore, this study confirmed that to improve hospital service, nurse burnout must be managed by the hospital management by taking care of the effect of nurse burnout on emotional exhaustion, depersonalization, and personal accomplishment. Previous studies (Meeusen et al., 2011; Mudallal et al., 2017) found that the more dominant dimension of nurse burnout was affected by emotional exhaustion. However, in this study, the personal accomplishment dimension was more dominant. This finding can be attributed to the relatively younger age of the respondents. This is aligned with the study by (Moya-Salazar et al., 2023) shown the age of young nurses is a predictor of burnout syndrome during the care of patients with COVID-19. In this situation, they tend to be dissatisfied with their self-achievement, work, and life. This can also be related to work-life balance problems that are often found in young nurses as shown in the previous studies (Adella et al., 2024; Topaz et al., 2016).

The variables discussed in this study pointed out that burnout has a relationship with patient satisfaction mediated by nurses' caring behavior and job satisfaction. This result can be used as an empirical model based on the results obtained. Out of five paths tested, three were proven significant and had a direction in accordance with the hypothesis. Therefore, the proposed model can be applied and tested on a wider population based on geographical coverage and different types of hospitals. The structural model provided a result that this study model had adequate predictive capability on patient satisfaction as a dependent variable. However, this result needs to be tested in a longitudinal study to obtain predictive results over time, particularly in post-pandemic working conditions.

This study showed that caring behavior also has a direct relationship with patient satisfaction, although nurse job satisfaction was still more dominant. This was in line with other findings on the relation of job satisfaction and patient satisfaction by Mahmoud & Reisel (2014), Andy & Antonio (2022), and Asif et al. (2019). The findings of this research add to the understanding of the relationship between nurse burnout and patient satisfaction which is mediated by caring behavior in the pandemic setting. Likewise, job satisfaction was seen to have a positive effect on nurse caring behavior when encountering the patient. The higher the nurse job satisfaction, the higher the nurse caring behavior (Xiaoming et al., 2014). Therefore, the hospital management must routinely monitor the satisfaction level of nurses, especially those who work on the front line. Results of IPMA indicated that for managerial implication, CB3, "I often ask patients how they want to be treated", should be taken into account in the nurse supervision and coaching since the existing response was still below average.

This study model with the independent variable of patient satisfaction had an R^2 value of 0.633, which was a medium to strong predictive accuracy for in-sample prediction, and a Q^2 predict of 0.568 for out-of-sample prediction value was categorized as a large predictive relevance. This means that despite any changes in the data set, the model will provide similar results. Compared to the other study, Weng et al. (2011) found a different result because the context of this study was carried out at a different time, which was during the COVID-19 pandemic this period provided a stronger stressor, both from the side of the disease and the management that needed to be adapted to the new policy. Interestingly, 75% of the respondents recovered from the infection by COVID-19. This personal experience in the pandemic situation can make they were more aware of their condition.

Despite the adequate result model as depicted in Figure 2, the conceptual framework in this study did not involve confounding factors which include age, gender, length of work, education level, work unit, and career stage. Each confounding factor can influence job satisfaction, caring behavior, and patient satisfaction. A previous study (Moya-Salazar et al., 2023) already indicates that age-related, particularly young nurses were more prone to burnout during the COVID-19 pandemic. Therefore, the interpretation of the result model needs to be done cautiously.

With the proposed model prediction value, the models can be recommended and replicated in future studies, especially by including confounding factors, or by carrying out subgroup analysis. This study provided a new contribution to the hospital treating COVID-19 patients that nurse burnout is possible to occur but can be well-managed by considering depersonalization, emotional exhaustion, and personal accomplishment. Nurse burnout is confirmed to have a negative influence, especially on nurse job satisfaction. Both nurse job satisfaction and nurse caring behavior have a direct relation to patient satisfaction, although nurse job satisfaction has a stronger value. However, the caring behavior shown by nurses is pivotal because this will appear when nurses interact with patients and could provide a good experience to the patients as stated in a previous study (Babapour et al, 2022; Kibret et al., 2022). To that end, hospital management needs to pay attention to caring behavior through routine surveys with both nurse and patient respondents. The results of such a survey will provide useful feedback for service improvement

5. Implications and limitations

The research findings provide the implication that relates to nurse burnout in the time of the pandemic. Even though the pandemic period has ended, this provides important lessons if in the future this pandemic event will recur. If the nurse cannot cope with the stressor that causes emotional exhaustion and the condition related to depersonalization and feelings of needing to complete personal accomplishments it will affect the level of patient satisfaction. The hospital management needs to consider nurse burnout in order to improve patient satisfaction with the hospital service. In the process in coping with the stressor, management can deploy support, for example, by providing adequate personal protective equipment (PPE) and the guiding safety of the work environment to protect nurses' work. On the other hand, management can also encourage supervision and coaching for nurses by paying more attention to emotional conditions, especially with the topic to increase the sense of personal accomplishment and reduce the feeling of exhaustion.

This study has several limitations, including the samples obtained by online questionnaire because of the COVID-19 pandemic. An online questionnaire has a disadvantage because the respondents cannot be directly observed. For instance, the emotional condition when filling out the questionnaire can be the bias. It is suggested that further studies should obtain data or distribute questionnaires face-to-face following the recommended health protocols. The other limitation is this study is related to generalization due to the limited sample size and source of the respondents. Further studies are suggested to broaden the respondents from various types of hospitals in different geographies. A more specific study on the type of department that the respondents work in is also suggested since it can affect answers. In various departments, during COVID-19, the workload of the nurses in each department is not the same, such as in the intensive care unit thus providing different stressors for the nurses. By specifying the department where the nurse works, the data can be analyzed more deeply to provide better insight for the hospital management.

6. Conclusion

This study was conducted on nurses in private hospitals during the COVID-19 pandemic period, which concluded that nurse burnout harmed job satisfaction and caring behavior. On the other hand, job satisfaction and caring behavior had a direct positive association with patient satisfaction from the nurse's perspective. Job satisfaction and caring behavior can mediate the negative relationship between nurse burnout and patient satisfaction. The higher nurse burnout the more reduction in job satisfaction and caring behavior. Therefore, for managerial implications, nurse burnout should be minimized and job satisfaction and caring behavior should be increased. This study showed that the strongest nurse burnout dimension was reflected by personal accomplishment followed by emotional exhaustion. In this study, nurse burnout was found to have a negative association with job satisfaction and nurse caring behavior. From this study, the suggestion can be made to increase patient satisfaction, especially by preventing nurses from having burnout. This can be done with supervision and coaching which increases the sense of personal accomplishment and avoids emotional exhaustion. Work stress including emotional exhaustion will affect nurse's well-being, thus reducing the sense of personal accomplishment. But if the nurses are aware and prepared that each work has a different difficulty level and challenges, they can respond without causing a heavy burden or pressure, hence they can perceive more job satisfaction. By understanding the process of burnout in nurses, preventive steps and interventions can be taken by hospital management to maintain the delivery of care.

Acknowledgment

The authors are grateful to all of the survey respondents for taking the time to fill out the questionnaire.

Author contribution

Conception and design of the study: F.A.; Supervision: F.A. and J.M.; Data collection: F.A. and A.A.; Data analysis: A.A. analyzed the data which was confirmed by F.A. and J.M. for accuracy; Drafting of the manuscript: F.A. and A.A.; Review and editing of the manuscript: A.A. All the authors are in agreement of the final version of the manuscript.

Conflict of interest

None declared.

References

Adella, A., Antonio, F., & Massie, R. G. A. (2024). The nexus of nurse work-life balance on performance: A case in a private hospital. *International Journal of Public Health Science (IJPHS)*, *13*(2), 611. https://doi.org/10.11591/ijphs.v13i2.23381

Altinoz, M. (2016). The influence of organization support perceived in enterprises on burnout feeling: A field research. *Procedia-Social and Behavioral Sciences*, *235*, 427–434.

Andy, A., & Antonio, F. (2022). Linking work engagement of emergency physicians to patient centricity in underdeveloped regions. *SA Journal of Human Resource Management*, *20*, 1–14. https://doi.org/10.4102/sajhrm.v20i0.1971

Andy, A., Zalfa El-Hamzah, S. M., & Antonio, F. (2022). Measures of nursing environment multidimensionality and patient centricity using importance-performance map analysis. *Nurse Media Journal of Nursing*, *12*(3), 325–339. https://doi.org/10.14710/nmjn.v12i3.47508

Asif, M., Jameel, A., Hussain, A., Hwang, J., & Sahito, N. (2019). Linking transformational leadership with nurse-assessed adverse patient outcomes and the quality of care: Assessing the role of job satisfaction and structural empowerment. *International Journal of Environmental Research and Public Health*, *16*(13), 2381. https://doi.org/10.3390/ijerph16132381

Babapour, A.-R., Gahassab-Mozaffari, N., & Fathnezhad-Kazemi, A. (2022). Nurses' job stress and its impact on quality of life and caring behaviors: A cross-sectional study. *BMC Nursing*, *21, 75*. https://doi.org/10.1186/s12912-022-00852-y

Bougie, R., & Sekaran, U. (2020). *Research methods for business: A skill-building approach (8th ed.).* John Wiley & Sons, Inc.

Cleven, A., Mettler, T., Rohner, P., & Winter, R. (2016). Healthcare quality innovation and performance through process orientation: Evidence from general hospitals in Switzerland. *Technological Forecasting and Social Change*, *113*, 386–395. https://doi.org/10.1016/j.techfore.2016.07.007

De Los Santos, J. A. A., & Labrague, L. J. (2021). Job engagement and satisfaction are associated with nurse caring behaviours: A cross-sectional study. *Journal of Nursing Management*, *29*(7), 2234–2242. https://doi.org/10.1111/jonm.13384

Galanis, P., Vraka, I., Fragkou, D., Bilali, A., & Kaitelidou, D. (2021). Nurses' burnout and associated risk factors during the COVID-19 pandemic: A systematic review and meta-analysis. *Journal of Advanced Nursing*, *77*(8), 3286–3302. https://doi.org/10.1111/jan.14839

García, G. M., & Calvo, J. C. A. (2012). Emotional exhaustion of nursing staff: influence of emotional annoyance and resilience. *International Nursing Review*, *59*(1), 101–107. https://doi.org/https://doi.org/10.1111/j.1466-7657.2011.00927.x

García, G.M, & Calvo, J. C.A (2020). The threat of Covid-19 and its influence on nursing staff Burnout. *Journal of Advanced Nursing*, *77*(2), 832–844. https://doi.org/10.1111/jan.14642

Garrosa, E., Moreno-Jiménez, B., Rodríguez-Muñoz, A., & Rodríguez-Carvajal, R. (2011). Role stress and personal resources in nursing: a cross-sectional study of burnout and engagement. *International Journal of Nursing Studies*, *48*(4), 479–489. https://doi.org/10.1016/j.ijnurstu.2010.08.004

Giacopelli, N. M., Simpson, K. M., Dalal, R. S., Randolph, K. L., & Holland, S. J. (2013). Maximizing as a predictor of job satisfaction and performance: A tale of three scales. *Judgment and Decision Making*, *8*(4), 448–469. https://doi.org/10.1017/s1930297500005301

Hair, J., Howard, M., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, *109*, 101–110.

Hair, J., Hult, G., Ringle, C., & Sarstedt, M. (2017). *A primer on partial least squares structural equations modeling (PLS-SEM).* SAGE.

Hair, J., Risher, J., Sarstedt, M., & Ringle, C. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Humas FKUI. (2020). *83% tenaga kesehatan Indonesia mengalami burnout syndrome derajat sedang dan berat selama masa pandemi COVID-19 [83% of Indonesian health workers experienced moderate to severe burnout syndrome during the COVID-19 pandemic].* Fakultas Kedokteran Universitas Indonesia. https://fk.ui.ac.id/berita/83-tenaga-kesehatan-indonesia-mengalami-burnout-syndrome-derajat-sedang-dan-berat-selama-masa-pandemi-covid-19.html

Jason, J., & Antonio, F. (2021). Antecedents of psychological empowerment and the impact on nurses burnout. *Jurnal Keperawatan Padjadjaran*, *9*(2), 148–158. https://doi.org/10.24198/jkp.v9i2.1674

Jun, J., Ojemeni, M. M., Kalamani, R., Tong, J., & Crecelius, M. L. (2021). Relationship between Nurse Burnout, patient and organizational outcomes: Systematic review. *International Journal of Nursing Studies*, *119*, 103933. https://doi.org/10.1016/j.ijnurstu.2021.103933

Kaur, D., Sambasivan, M., & Kumar, N. (2013). Effect of spiritual intelligence, emotional intelligence, psychological ownership and burnout on caring behaviour of nurses: a cross-sectional study. *Journal of Clinical Nursing*, *22*(21–22), 3192–3202. https://doi.org/10.1111/jocn.12386

Kibret, H., Tadesse, B., Debella, A., Degefa, M., & Regassa, L. D. (2022). The association of nurses caring behavior with the level of patient satisfaction, Harari Region, Eastern Ethiopia. *Nursing: Research and Reviews*, *12*, 47–56. https://doi.org/10.2147/nrr.s345901

Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information Systems Journal*, *28*(1), 227–261.

Mahmoud, A., & Reisel, W. (2014). Relating patient satisfaction to nurses' job satisfaction, job security, and obedience OCBs. *International Journal of Pharmaceutical and Healthcare Marketing*, *8*(1), 45-61. https://doi.org/10.1108/IJPHM-01-2013-0001

Meeusen, V. C., Van Dam, K., Brown-Mahoney, C., Van Zundert, A. A., & Knape, H. T. (2011). Understanding nurse anesthetists' intention to leave their job: how burnout and job satisfaction mediate the impact of personality and workplace characteristics. *Health Care Management Review*, *36*(2), 155–163. https://doi.org/10.1097/hmr.0b013e3181fb0f41

Memon, M. A., T., R., Cheah, J.-H., Ting, H., Chuah, F., & Cham, T. H. (2021). PLS-SEM statistical programs: A review. *Journal of Applied Structural Equation Modeling*, *5*(1), 1–14. https://doi.org/10.47263/jasem.5(1)06

Moya-Salazar, J., Buitrón, L. A., Goicochea, E. A., Salazar, C. R., Moya-Salazar, B., & Contreras-Pulache, H. (2023b). The age of young nurses is a predictor of burnout syndrome during the care of patients with covid-19. *Nursing Reports*, *13*(2), 721–730. https://doi.org/10.3390/nursrep13020063

Mudallal, R. H., Othman, W. M., & Al Hassan, N. F. (2017). Nurses' burnout: The influence of leader empowering behaviors, work conditions, and demographic traits. *Inquiry : A Journal of Medical Care Organization, Provision and Financing*, *54*, 46958017724944. https://doi.org/10.1177/0046958017724944

Raudenská, J., Steinerová, V., Javůrková, A., Urits, I., Kaye, A. D., Viswanath, O., & Varrassi, G. (2020). Occupational burnout syndrome and post-traumatic stress among healthcare professionals during the novel coronavirus disease 2019 (COVID-19) pandemic. *Best Practice & Research. Clinical Anaesthesiology*, *34*(3), 553–560. https://doi.org/10.1016/j.bpa.2020.07.008

Regina, M., Henny, S., & Antonio, F. (2021). The antecedents of psychological empowerment and its impact towards general physician job performance. *Open Access Macedonian Journal of Medical Sciences*, *9*, 1322–1330. https://doi.org/10.3889/oamjms.2021.7270

Rego, A., Godinho, L., McQueen, A., & Cunha, M. P. (2010). Emotional intelligence and caring behaviour in nursing. *The Service Industries Journal*, *30*(9), 1419–1437. https://doi.org/10.1080/02642060802621486

Ringle, C. M., & Sarstedt, M. (2016). Gain more insight from your PLS-SEM results the importance-performance map analysis. *Industrial Management and Data Systems*, *116*(9), 1865–1886. https://doi.org/10.1108/IMDS-10-2015-0449

Sarstedt, M., Hair, J., Pick, M., Liengaard, B., Radomir, L., & Ringle, C. (2022). Progress in partial least squares structural equation modeling use in marketing research in the last decade. *Psychology & Marketing*, 39, 1035–1064. https://doi.org/10.1002/mar.21640

Sarstedt, M., Ringle, C., & Hair, J. (2017). *Partial least squares structural equation modeling. Handbook of market research*. Springer International Publishing.

Tervo-Heikkinen, T., Kvist, T., Partanen, P., Vehviläinen-Julkunen, K., & Aalto, P. (2008). Patient satisfaction as a positive nursing outcome. *Journal of Nursing Care Quality*, *23*(1), 58–65. https://doi.org/10.1097/01.NCQ.0000303806.09242.37

Topaz, M., Lisby, M., Morrison, C. R. C., Levtzion-Korach, O., Hockey, P. M., Salzberg, C. A., Efrati, N., Lipsitz, S., Bates, D. W., & Rozenblum, R. (2016). Nurses' perspectives on patient satisfaction and expectations: An international cross-sectional multicenter study with implications for evidence-based practice. *Worldviews on Evidence-Based Nursing*, *13*(3), 185–196. https://doi.org/10.1111/wvn.12143

Torlak, N. G., Kuzey, C., Sait Dinç, M., & Budur, T. (2021). Links connecting nurses' planned behavior, burnout, job satisfaction, and organizational citizenship behavior. *Journal of Workplace Behavioral Health*, *36*(1), 77–103. https://doi.org/10.1080/15555240.2020.1862675

Weng, H.-C., Hung, C.-M., Liu, Y.-T., Cheng, Y.-J., Yen, C.-Y., Chang, C.-C., & Huang, C.-K. (2011). Associations between emotional intelligence and doctor burnout, job satisfaction and patient satisfaction. *Medical Education*, *45*(8), 835–842. https://doi.org/10.1111/j.1365-2923.2011.03985.x

WHO. (2020). *COVID-19 Public Health Emergency of International Concern (PHEIC) Global research and innovation forum*. https://www.who.int/publications/m/item/covid-19-public-health-emergency-of-international-concern-(pheic)-global-research-and-innovation-forum

Xiaoming, Y., Ma, B.-J., *Chang*, C., & Shieh, C.-J. (2014). Effects of workload on burnout and turnover intention of medical staff: A study. *Studies on Ethno-Medicine*, *8*, 229–237. https://doi.org/10.31901/24566772.2014/08.03.04

Nurse Media
JOURNAL OF NURSING

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):53-64, April 2024
https://doi.org/10.14710/nmjn.v14i1.57287

ORIGINAL RESEARCH

Problems of Myanmar Women of Reproductive Age in Accessing Health Services as Migrant Workers in Thailand: A Qualitative Study

Piyaporn Sitkulanan[1], Kunnikar Chaisitsanguan[1], Prakaipetch Winaiprasert[1], Wilailuck Wong-arsa[1]

[1]*Faculty of Nursing, Thammasat University, Pathum Thani, Thailand*

Article Info

Article History:
Received: 10 August 2023
Revised: 26 March 2024
Accepted: 1 April 2024
Online: 30 April 2024

Keywords:
Health service; migrant worker; Myanmar; women

Corresponding Author:
Piyaporn Sitkulanan
Faculty of Nursing, Thammasat University, Pathum Thani, Thailand.
Email: piyaporn@nurse.tu.ac.th

Abstract

Background: The largest portion of migrant labor in Thailand originates from Myanmar, with almost half consisting of female workers. Most female migrant workers (MWs) are of reproductive age and often experience physical illnesses, including pregnancy and childbirth. Although access to prenatal care and delivery services for Myanmar MWs has been previously studied, their challenges in accessing other reproductive health services (HSs) have not yet been explored.
Purpose: This study aimed to explore problems in accessing health services experienced by women of reproductive age (WRA) who were members of the Myanmar migrant workforce in Thailand.
Methods: The present study employed a qualitative research design. The samples consisted of 20 informants aged 18-49 years old, who were Myanmar WRA working as migrant laborers for more than one year. They were subdivided into two groups: 10 participants provided information through in-depth interviews, and the other 10 participated in focus group discussions, with each group comprising 5 individuals. The researchers selected informants using criterion sampling. Data analysis utilized the Diekelmann and Allen method.
Results: The findings revealed two general themes, including care ineligibility and problems in accessing health services. The six major issues among Myanmar WRA include inability to purchase or renew health insurance cards (HICs), HIC or social security wage deduction avoidance, communication issues, hospital inexperience, the transit fare, and admission refusal.
Conclusion: Despite available health services, migrant women from Myanmar encounter barriers such as inability to purchase health insurance cards, wage deduction concerns, communication issues, hospital unfamiliarity, transportation expenses, and admission refusal. Addressing these barriers through policy interventions and support mechanisms is crucial for enhancing healthcare access.

How to cite: Sitkulanan, P., Chaisitsanguan, K., Winaiprasert, P., & Wong-arsa, W. (2024). Problems of Myanmar women of reproductive age in accessing health services as migrant workers in Thailand: A qualitative study. *Nurse Media Journal of Nursing, 14*(1), 53-64. https://doi.org/10.14710/nmjn.v14i1.57287

1. Introduction

Thailand is experiencing a sizeable migrant workforce entering the country as a consequence of its rapid economic expansion, resulting in demand for labor to keep it active (Ministry of Labor, 2021). Much of the migrant workforce is from Myanmar, Laos and Cambodia, while the majority of the migrant workers (MWs) are from Myanmar since many of them were fleeing the poverty of their home country (The World Bank, 2018). Many had clashed with the army of Myanmar and were thus forced to flee to Thailand as laborers (BBC News Thai, 2022). The provinces with the largest migrant workforce are the Bangkok Metropolis, its suburbs, and the major upcountry provinces (Foreign Workers Administration Office, 2021a). In December of 2020, the Bangkok Metropolis and its suburbs had a total migrant workforce of 1,023,287, and 735,881 of the workers were of Myanmar nationality (71.91%) (PPTV Online, 2020). Nearly one half of these workers were female (Foreign Workers Administration Office, 2021b).

A majority of the women in the migrant workforce are of reproductive age and were facing problems in their reproductive health, contraception planning, pregnancy and childbirth (Phetsaen & Haritavorn, 2019). When their bodies become fatigued from working, they consume an energizing beverage and use medication. In the event of minor illness, they simply purchase medication which they take on their own, rest, and then return to their work (Sangsrijan et al., 2016). If their illness is serious, they seek care at a primary-care hospital (Vichanjalearnsuk & Chaimanee, 2015). In a study conducted by Phetsaen and Haritavorn (2019) that explored the situations of Myanmar MWs' access to prenatal care and delivery services, it was found that the social health determinants affecting service access of women in the migrant workforce from Myanmar included MW health policy, service system, transportation, income, the nature of the work and social support. Most of the obstacles consisted of language matters and communication (Phetsaen & Haritavorn, 2019).

Thai welfare provides care for its migrant workforce in the form of health insurance cards (HICs) and social security (SS) cards. The cost of preparing the HICs is roughly 129 US dollars; and for the SS cards, it is roughly 37 US dollars (Rajavithi Hospital, 2022). Both Thai nationals and foreigners can receive treatment services matching their health problems.

Women were known to have higher rates of illness than men. They had higher rates of disability, and their self-rated health was typically lower than that of men (Simons et al., 2023). Women were more likely than men to engage preventative health services (HSs), even when accounting for antenatal and reproductive HSs (Simons et al., 2023). It is the policy of Thailand to adjust the status of the migrant workforce lawfully so that the workforce can then enter the system and be on medical welfare. However, it was found that more than one half of the migrant workforce still had no access to medical welfare (Sritiang, 2021). The situations of Myanmar MWs' access to prenatal care and delivery services have been previously studied (Phetsaen & Haritavorn, 2019), however, their problems in accessing other reproductive HSs have not been explored. Therefore, the researchers wanted to learn about the issues that female Myanmar MWs had been facing in accessing reproductive HSs in order to understand why many refused to use the government's medical services and only seek treatment when seriously ill. Accordingly, this study was conducted to explore problems in accessing health services among women of reproductive age (WRA) who were members of the Myanmar migrant workforce in Thailand. The researchers were especially hopeful that the results of their study would serve as a foundation of policy-based decision making aimed at developing an HS system for the migrant workforce that would be both efficient and suitable.

2. Methods

2.1. Research design

The present study employed a qualitative research design with a Heideggerian hermeneutic phenomenology approach (Heidegger, 2019) to explore healthcare access issues among working women of childbearing age from Myanmar who migrated to Thailand as laborers.

2.2. Setting and participants

This study was conducted among Myanmar women of reproductive age residing in Thailand. The samples consisted of 20 informants, who were subdivided into 10 participants providing information through in-depth interviews and 10 participants participated in focus group discussions, with each group comprising 5 individuals.

In individual interviews, the first informant was selected based on the predetermined criteria. The researchers visited a fresh vegetable market in Pathum Thani, introduced themselves to some vendors, and asked for their suggestions. The Myanmar women were selected based on the criteria as follows: working as migrant laborers and were in the age range of 18-49 years. They had been working in Talaad Thai market, Pathum Thani, for more than one year. Once these informants agreed to take part in the research, the researchers used the snowball-sampling method to recruit other informants for the interviews to the point of information saturation, that is, when additional information did not contribute to new understanding. For the group discussions, the researchers scheduled the place, date, and time for the subjects selected according to their criteria.

2.3. Data collection

In this study, data collection was conducted for six months, from August 2022 to January 2023, before which the research team submitted a request for research permission to Talaad Thai authority. After that, the researchers carried out the data compilation. Upon meeting the key participants, the researchers began the investigation by introducing themselves and clarifying the objectives of the study and the data collection method. Participants were given time to consult their families on whether to participate the next day. They took the subject information sheet and informed consent form home to read. On the second day, after the key participants signed their participation agreements, the principal investigators and the research assistants formed a relationship and a sense of familiarity with the people in the sample group. Once the key participants had become more familiar with the research, the in-depth interviews were conducted in the participant's home in a two-way communication format, which helped to foster a more direct understanding with factual meanings that the informants wanted to convey. Their emotions could be read from their facial expressions and demeanor. The result was more detailed information enabling a complete understanding of purpose and background. It became possible to delve into problems that were difficult or too sensitive to talk about. It fostered insight into the problems and made it possible to acknowledge the particular matters that the interview subjects were dealing with. It then became possible to test the validity of the information that had been supplied. Interviews continued for 45-60 minutes per session and were conducted in-line with the prepared questions.

During the interview, the investigators asked several questions (see Table 1) and made certain that the data from the key participants was accurate. This procedure allowed the key participants to elaborate on some points that were unclear. The nature of the interview was conversational and based on attentive listening without judgment. Interviewers encouraged the key participants to share their experiences. The assistants recorded and took field notes throughout the interview and made arrangements for an additional interview whenever some points were still unclear. Informants were interviewed twice. The next interview would take approximately 30 minutes. The interview continued until the investigators were fully satisfied. An examination of the information obtained indicated that the information just received was actually a duplicate, and that there was no new information. In addition, data were also collected via focus group discussions (FGDs) in order to draw conclusions from a large group of people's opinions. Each group consisted of 5 members, who participated in an FGD for 45-60 minutes, with the researchers leading the groups and the research assistants serving as observers and recorders. The participants were arranged in a circle to make it easier for them to express their opinions. The focus group method had the advantage that the participatory information obtained revealed a diversity of viewpoints, while the reactions of those taking part in the conversations were quite similar, resulting in in-depth information on those matters. For the informants who were willing to take part in the group conversations, a time and familiar setting were designated, free from disturbances such as from a temple or school.

Table 1. Question guidelines

List of Questions for the Participants
• When you are ill, what are your rights in receiving care?
• What experience do you have in making use of your rights to receive care?
• How do you feel about your rights to receive the care you now have?
• Where do you mostly get medical care?
• How do you feel about going to hospital?
• What are the barriers to receiving health services?

2.4. Data analysis

The first phase of data analysis involved compiling the data itself, which included attentive listening, reflecting, clarifying, and pondering. Transcripts of the audio recordings were prepared, and field notes were also recorded. All recorded data was then analyzed for its contents using the seven stages of data analysis proposed by Diekelmann et al. (1989). Stage 1 involved examining all transcribed data for a general overview. Stage 2 was included preparing written summary interpretations and necessary coding to determine possible themes in each transcript. Stage 3 consisted of grouping the transcripts as a single unit, categorizing based on the question issues, then analyzing the content, writing main and sub-themes, finding keywords, identifying highlights of the story, and describing the data in detail according to the main and sub-themes. Stage 4 involved reviewing the transcripts or revisiting the participants to clarify any issues or discrepancies in interpreting the data obtained, and then composing a composite analysis of the various texts. Stage 5 included making comparisons and performing contrastive analyses of the various texts to identify and describe common practices and meanings. Stage 6 focused on determining the constitutive patterns that linked the various themes. Stage 7 involved inviting responses and obtaining suggestions to prepare a final draft by consulting with an associate knowledgeable about the content and/or methodology employed in this study.

2.5. Rigor/trustworthiness

The researcher established a procedural methodology for ensuring data trustworthiness following the concepts of Lincoln and Guba (1985). The lead researcher, an associate nursing professor with 20 years of experience in gynecology and women's health, initiated the introduction to the informants through an interpreter to establish reliability. The informants' perception of the researcher's reliability would impact the accuracy and truthfulness of the information gathered. The process was conducted as in-depth interviews, allowing informants to express their viewpoints openly and comprehensively. To acquire complete and accurate information, the researchers employed various techniques such as repetition in questioning, sampling, and feedback. They verified the accuracy of information gathered from interviews and observations, systematically recording it in summary form. This information was then reviewed with the informants to ensure its correctness. The research team, consisting of nursing instructors experienced in quality research, individually analyzed the information, compiling it categorically until reaching a consensus. For dependability, the study employed "overlapping methods" and provided a detailed methodological description to facilitate replication. A triangular test was conducted by the researchers, who compared their on-location information with data obtained through direct observation, interviews, and group discussions. Additional interviews were scheduled to address unclear issues, repeating the same questions with a different interviewer to assess consistency. Regarding transferability, background data of participants was provided to establish the study's context and offer a detailed description of the phenomenon under investigation, enabling comparisons to be made as necessary.

2.6. Ethical considerations

This research project obtained ethical approval from the Human Research-Ethics Committee of Thammasat University under COA no. 058/2565. All participants were informed of the study and signed informed consent. In the observational data collection, the investigators only took part in the permitted activities. The investigators always asked for permission prior to recording or taking pictures and sought approval before posting any pictures in their research report. The information collected in this study was kept confidential by researchers. All documents were destroyed once the research was complete. Results were presented collectively as a single general illustration. No study results of any individual were referenced. Pseudonyms were used in place of the actual names of the key participants.

3. Results

3.1. Characteristics of the participants

As shown in Table 1, it can be observed that 50% of the Myanmar WRA who worked as migrant laborers were aged between 20 and 24 years, and 70% of them were married. Additionally, 85% of the women identified as Buddhist, and 85% had completed primary school. About 70% had been working in Thailand for 3-5 years, while 65% reported a family income ranging from 15,001 to 25,000 Baht, and 75% stated that their income was sufficient to cover their expenses. Furthermore, 80% had two members living in their households, and 80% did not have any chronic diseases. Regarding employment status, 80% were employed, while 65% did not possess a work permit. Moreover, 70% did not have eligibility for healthcare, and 40% were utilizing services from a primary-care hospital. Approximately 70% were unable to understand conversational Thai.

3.2. Qualitative themes

Two constitutive patterns with relational themes were identified, namely 1) care ineligibility and 2) difficulties in accessing HSs. Detailed problems experienced by women in the Myanmar migrant workforce who were of reproductive age in accessing their HSs are shown in Figure 1.

Table 2. Characteristics of the participants

General information	Frequency	Percentage
Age ($\bar{x}$=31, SD=4.10)		
18-19 years of age	6	30
20-34 years of age	10	50
35 years of age and above	4	20
Marital status		
Single	4	20
Married	14	70
Divorced	1	5
Widowed	1	5
Religion		
Buddhist	17	85
Christian	1	5
Islam	2	10
Educational Level		
Elementary school	17	85
Middle and high school	2	10
Higher education	1	5
Length of time working in Thailand ($\bar{x}$=5, S.D.=3.40)		
2-1 years	2	10
5-3 years	14	70
More than 5 years	4	20
Monthly family income ($\bar{x}$=18,000, S.D.=3.70)		
Under10 ,000 Baht	1	5
10,000-15,000 Baht	6	30
15,001-25,000 Baht	13	65
Income sufficiency		
Insufficient to maintain livelihood	1	5
Sufficient to meet expenses	15	75
Residual income	4	20
Number of family members living at home ($\bar{x}$=2, S.D.=3.10)		
2	16	80
3	3	15
4	1	5
Chronic diseases		
No chronic diseases	18	90
1 chronic disease	1	5
2 chronic diseases	1	5
Employment status		
Employed	16	80
Unemployed	4	20
Had a work permit?		
Yes	7	35
No	13	65
Care eligibility		
Ineligible	14	70
Eligible for HIC / SS card	6	30
Where to receive medical services		
Drugstore	5	25
Clinic	3	15
Private hospital	1	5
Primary-care hospital	8	40
Secondary-care hospital	2	10
Tertiary-care hospital	1	5
Ability to converse in the Thai language		
Unable to understand conversational Thai	3	15
Able to converse in Thai somewhat	14	70
Able to converse in Thai quite well	3	15

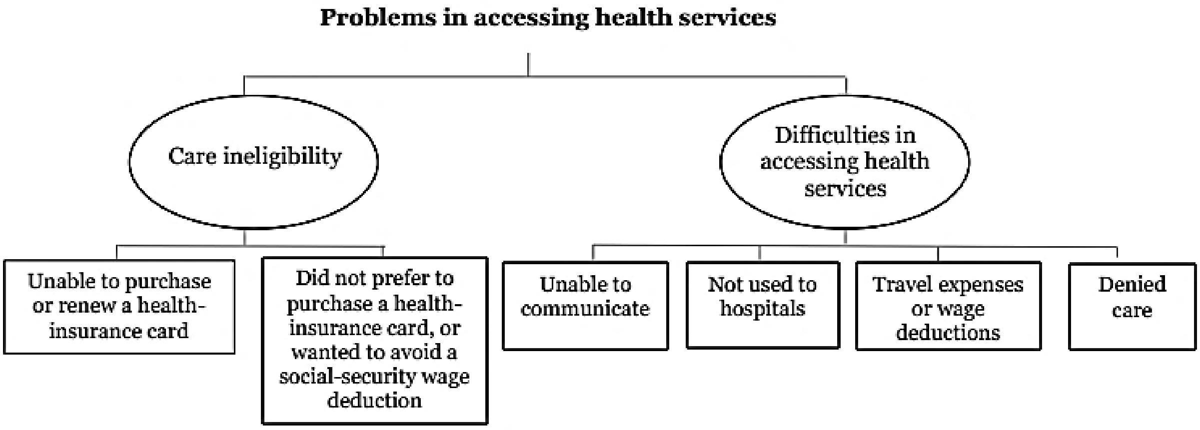

Figure 1. List of themes and sub-themes of the study

3.2.1 Theme 1: Care ineligibility

This theme describes participants' ineligibility to receive care with two subthemes: unable to purchase or renew health insurance card and did not prefer to purchase an HIC or wanted to avoid SS wage deduction.

3.2.1.1 Subtheme 1: Unable to purchase or renew health insurance card

The participants stated that they were workers without passports; thus, they had no health-care welfare. Consequently, they were reluctant to visit hospital. The Myanmar MWs who were abducted and forcibly brought into Thailand had no passports. If they developed symptoms of a serious illness, they did not dare to visit hospital for fear of being arrested and deported. In some cases, they either purchased medication to ease the severity of their symptoms, or they simply ended up dying from their illness. In some cases, they received expensive health-care at a clinic. If they succeeded in gaining admission to hospital, they had no welfare-based care benefit and had to pay the full cost of their care unassisted, forcing them to borrow from their employer. A hospital that provided good care set appointments to monitor the care results. A participant stated the following:

> *I have no passport and I have no regular employment. I have no welfare-based medical care, so that, whenever I am ill, I have to buy my own medicines and take them on my own. Sometimes, I will go to the clinic; but I have to pay a lot of money whenever I go there, so that I end up having to borrow some money from my employer. Right now, I am in debt. It really depresses me. (Cole, showing a stressed facial expression)*

The participants also stated that they were unable to buy or renew a HIC if they had a history of health problems. The hospitals did not sell HICs to MWs, including those who had prior health problems and pregnant women; or, if it was discovered that a worker had a health problem, they did not renew her HIC. A participant stated:

> *When I was five-months pregnant, I was in another province at the time. My health insurance card had expired. When I went to buy new card, they wouldn't sell me one because I was pregnant. It was just awful! (Amitii)*

3.2.1.2 Subtheme 2: Did not prefer to purchase an HIC or wanted to avoid SS wage deduction

The participants mentioned that they chose not to buy a HIC because they did not believe it would provide coverage if they got ill. They would thus be forced to pay for their own care on top of paying for the card.

> *When my relatives get sick, they go to the hospital. They have the card, but they are reimbursed for only part of the treatment cost. It's such a bad situation. They have to lay*

> *out so many more dollars (deep sighing sound). So, I think it would be better if I just didn't buy the card. (Trixie)*

The cost of a HIC was high, and they did not see the need for it. They were quite healthy and robust, and if they became ill, they could purchase medicine at a drugstore. A participant stated:

> *I'm usually healthy and I don't get sick. I've never had anything wrong with me. The card is expensive, so I'm not planning on getting one. So, the hell with it! I would be just throwing money away!* (Irene)

The findings also revealed that the study participants were unwilling to get an SS card, since they wanted to avoid an SS deduction from their wages. A participant stated: *It would be good if my employer paid for all of my social security. I'm not going to go for him paying just one half while I pay the other half.* (Sidney)

3.2.2 Theme 2: Difficulties in accessing health services

This theme describes participants' difficulties in asessing healh services with four subthemes: unable to communicate with medical staff, unfamiliarity with the hospitals where they were eligible for treatment, had to pay the transit fare, and denied care at a hospital where their HIC was registered.

3.2.2.1 Subtheme 1: Unable to communicate with medical staff

The study participants could not communicate with medical personnel well enough to be understood. Thus, the care that they received did not directly address their actual health problems, or they may not have received it in time. Hiring an interpreter to visit the hospital along with the patient added to the cost. Furthermore, although some hospitals had interpreters on duty, the workers could not make it to the hospital, since it was situated too far from their places of work. A participant stated:

> *On many times when I go to the hospital, I run into problems. It's terrible! I have no idea how I'm going to communicate with the doctor since I don't know Thai (displaying a frowning countenance). If I hire an interpreter to go to the hospital with me, it will cost me even more. But, if I don't hire an interpreter to go with me, the doctor is not going to understand anything I say. So, I just get some paracetamol. Consequently, I never recover from my illness. (Ellie, as she let out a sigh)*

3.2.2.2 Subtheme 2: Unfamiliarity with the hospitals where they were eligible for treatment

Some participants were now eligible to receive treatment. However, whenever an urgent situation arose requiring them to use their right to hospital treatment, they preferred not to go there, as stated by a participant below:

> *I'm someone who doesn't like hospitals. Oh... I would go to a hospital to be treated for a serious illness or for the birth of my baby. But if I were to become eligible for treatment at a hospital where I have never been before, it would only make it even harder for me to go there. (Mabel, shaking her head)*

3.2.2.3 Subtheme 3: Had to pay the transit fare

The participants also mentioned they had to pay for transit fare to obtain HSs. There could be a deduction from their wages. Although the participants had HICs or SS cards, they were unable to access the services of a hospital where they were registered because of the transit fares. There could also be a deduction from their wages for their time away from work while getting treatment. Two participants stated the following:

> *My employer has his office in Bangkok. So, he bought my health insurance card for a hospital nearby to his office. But I work right here, and I don't want to go to a hospital in Bangkok because of the time it would take and the cost of transportation. (Alish, shaking her head)*

> *While I was ill, I had to be away from work. So, he deducted it from my wages, and I never got to use my right to be treated at the hospital. If I come down with some minor ailment, I'll just take some medicine that I can buy on my own." (Lana)*

3.2.2.4 Subtheme 4: Were denied to receive care at a hospital where their HIC was registered

The participants stated that when they were ready to give birth or were seriously ill, the hospitals where they had registered their HICs refused to provide service on the grounds that they did not have available medical instruments, such as incubators, or specialists. A participant stated:

> *I was having preterm-labor pains, so I went to the hospital according to my eligibility. They told me that my baby had to be delivered in a premature-birth ward, but there weren't enough incubators available. I would have to go to another hospital, instead. Oh! (Ellie)*

4. Discussion

This study explored the problems in accessing HSs experienced by WRA who were members of the Myanmar migrant workforce that had migrated into Thailand. This research found that there are two issues involved in the problems being experienced by the participants in receiving their HSs.

4.1 Ineligible to receive treatment

The findings of this study showed that participants were unable to purchase or renew their HICs since they have no passport, and cannot request eligibility for various kinds of treatment. Furthermore, their labor status is contrary to the law (Information Center for Contacting Government Officials, 2023). Consequently, the MWs are reluctant to visit hospital for treatment for fear of being arrested and deported. In a similar study conducted in Denmark, it was found that the MWs who had surreptitiously entered the country were afraid of being deported. Accordingly, they avoided going anywhere for treatment. Instead, they opted to buy medicine, which they took on their own (Funge & Boye, 2020). In a study conducted in the United States, it was found that immigration status was an obstacle to HS access because of the fear of being deported, while the practice of discrimination was causing a reduction in the use of HSs (Rangel et al., 2019). Although the hospitals in Thailand have not been denying care to MWs, the practice arresting MWs who had entered the country illegally while on their way to hospital has impeded their access to HSs. In these cases, they purchase their own medications and then take them on their own. Some of these people experience severe symptoms, even to the point of death. Some MWs receive treatment at clinics, where they must pay a fee. Even if a worker manages to get to a hospital, that worker is not on treatment welfare, so she is forced to pay the cost of treatment on her own by borrowing from her employer. Some of the MWs cannot meet their payment responsibilities for their medical costs, so that the burden of these costs (Hfocus, 2023; Jongudomkarn et al., 2019; Poonpoksin, 2018) - which may run as high as 14.3 billion US dollars annually (Thai Civil Rights and Investigative Journalism, 2017) - is then thrust upon the hospitals themselves.

The findings also revealed that participants were unable to purchase or renew their HICs if they have a history of health problems. The reason may be that the hospitals are uncertain when the care expenses would be disbursed from the Ministry of Public Health (MoPH), or if certain diseases are eligible for the HIC. The MoPH should clearly specify the diseases for which they may become eligible for treatment and assure hospitals concerning the disbursement of funds. The Ministry should likewise monitor and evaluate its results for the purpose of planning budget-support guidelines aimed at providing HSs to MWs (Thalerngpol, 2020).

This study demonstrated that Myanmar WWs do not want to purchase a HIC, or they do not want a SS deduction from their wages, because the HIC does not cover expenses for being ill. It requires additional payment for treatment. As Sittikan and Jongudomkarn (2020) stated, making arrangements for HSs is a necessary element in providing access to the HSs. The MoPH should therefore consider making eligibility for HIC benefits applicable to MWs while providing adequate coverage for their illnesses. The participants in this study do not want to purchase a HIC because it is expensive, and they do not see the need for an HIC. They are healthy and robust and if they become ill, they can buy medication from a drugstore. The need to spend money to stay healthy can create a financial obstacle in accessing quality HSs (Thomson et al., 2019). The Government should therefore engage in a public-relations effort to inform the workforce of the benefits of having an HIC, as well as fix the price of the HIC at an appropriate level. Furthermore, it should set a health-promotion policy for the MWs to reduce the rate of becoming ill and having to be treated at the hospital. Furhermore, they participants also mentioned that they do not want an SS deduction from their wages. Although sections 33, 39 and 40 of the law pertaining to SS cards are in force (Social Security Office, 2023), some members of the migrant workforce are still unwilling to apply for an SS card because they do not want any deductions from their wages. It becomes necessary, therefore, to obtain the cooperation of employers on the subject of SS, urging them to explain how the system works for their MWs, and thereby help them to understand the benefits of SS.

4.2 Problems in accessing health services (HSs)

This study showed several problems in accessing HSs among the participants, for example the inability to communicate with medical staff. When the MWs are unable to communicate, the HSs they receive do not correspond to their actual health problems, or the treatment they receive may not be timely. Similarly, in a study conducted by Pandey et al. (2021), it was found that language was an obstacle in the care of migrants. This causes delays in providing the proper care. In a study conducted in England, it was found that problems in communicating in English with service providers constituted a significant obstacle for exiles who wanted access to the available HSs (Fang et al., 2015). The inability to communicate with service providers and medical personnel constituted a lack of opportunity to seek HSs or to access HSs (Reddy et al., 2019). Hiring an interpreter to accompany them to the hospital adds to their total expense; and although some hospitals have interpreters on duty, the workers cannot make it to the hospital since it is situated too far from their places of work. Furthermore, if the interpreter lacks an understanding of medical issues, this could lead to misunderstandings between the doctor and patient, followed by an incorrect diagnosis and, ultimately, to severe consequences like harmful effects from the medication prescribed, permanent disabilities, or even loss of life (Alder, 2023; Fang et al., 2015; Inciso, 2021). For that reason, the medical personnel should master the necessary skills for overcoming the obstacles of communicating in different languages so that these MWs have better access to their HSs.

Another problem in accessing HSs among the participants concern with unfamiliarity with the hospitals where they have treatment eligibility. Although the study participants are eligible for treatment, when they need to use their treatment eligibility at a new hospital, they do not prefer to use the services it offers, because their unfamiliarity with the environment of that new facility causes them a sense of uneasiness (SONIFI Health, 2023). This unfamiliarity is a significant obstacle that causes the MWs to avoid accessing their HSs. Accordingly, the medical staff needs to focus its attention on making the MWs feel at ease rather than isolated and different from the other patients. Staff members should have a positive outlook toward MWs. Furthermore, staff members need to have an understanding of people of migrant background, including their different religions and diverse cultures. They must learn to accept and respect the differences (World Health Organization, 2023) while showing sympathy for those who need their services. They should speak pleasantly, smile, and listen attentively. Friendly facial expressions can help create a stronger bond with migrant laborers.

Furthermore, this study also found that the problems in accessing HSs among MWs are also related to transit fares and that they may suffer deductions from their wages. Although the MWs have SS cards or HICs, they are unable to receive their services at the hospitals where they are registered because of the transit fares. Also, there may be deductions from their wages because of their time away from work while receiving treatment, in spite of what the law now stipulates. Similarly, research conducted in Malaysia, found that services that entail expenses like wage deductions and transportation costs constitute barriers to medical-care access for refugees (Chuah et al., 2018).

The finding of this study also showed that MWs experienced denied treatment from the hospitals where they registered their HICs. When the women of the migrant workforce are ready to give birth or fall seriously ill, the hospitals will often deny them the services they need, claiming they do not have enough instruments and medical personnel. The reason for this situation is that those hospitals are secondary-care or tertiary-care hospitals. There are limitations in the treatment of certain types of diseases that pertain to equipment shortage, such as in incubators for premature babies. For that reason, prior to distributing HICs, it is necessary to ensure that the workers understand the limited capacity of a hospital in rendering treatment and the system for patient transfer in the case of a hospital with limitations (Sutapuk, 2019). The workers should then be required to repeat it because, as found by the researchers, there were many instances where the migrant laborers appeared to understand what was explained to them, but, when attempting to explain it, they were unable to do so.

5. Implications and limitations

This study reveals that certain MWs face barriers in accessing healthcare due to the inability to afford or renew HICs, leading them to self-pay for treatments. Consequently, low-income workers either avoid hospital care or struggle to access HSs, resorting to self-medication. Variations in medication effects, stemming from diverse physical conditions, drug hypersensitivity, or comorbidities, exacerbate disease symptoms, prompting MWs to seek emergency treatment, complicating nursing efforts. Addressing these challenges necessitates not only improving social welfare for treatments but also providing culturally sensitive medical and nursing care, along with friendly service provision, mindful of their cultural and language differences.

This study has certain limitations. Some participants faced communication barriers with the researchers, necessitating the use of an interpreter. However, the interpreter's limited language skills, despite having around five years of experience, posed challenges. Moreover, the interpreter's accent proved difficult for researchers to comprehend. Therefore, employing interpreters with more experiences is recommended to facilitate smoother communication.

6. Conclusion

This study showed two themes, including care ineligibility and difficulties in accessing HSs. From the research findings, it was further found that Myanmar female foreign workers were not entitled to treatment since they had no passport. They could not afford to purchase or renew their HICs if they had a history of health problems. They did not wish to purchase HICs, nor did they want any SS deductions taken from their wages. They were unable to communicate and were unaccustomed to the hospital setting. They had to pay their own commuting expenses, or there were deductions taken from their wages. In addition, they were denied treatment due to hospital limitations. The Ministry of Health should require that the entire migrant foreign workforce have health insurance without taking into consideration their legal status. They should not need to have their employers certify their entry into the health-care system. Similarly, the Ministry should not need to consider their health status before they are able to purchase health insurance, but should, instead, procure the services of an interpreter at every hospital, since the Myanmar labor force is quite sizeable. Furthermore, the Ministry should develop a health-delivery system to ensure that they will never have the feeling of being denied treatment. A future research should conduct a study on guidelines for improving access to HSs for migrant female workers from Myanmar, as well as a study on a format for providing friendly service.

Acknowledgment

This study was supported by Thammasat University Research Fund, Contract No. TUFT 41/2566. The authors would like to thank Professor Pranom Othaganont for the valuable advice, which helped to make this research a success.

Author contribution

All authors (PS, KC, PW and WW) contributed substantially to the study design, data collection, analysis, and interpretation of results. All authors drafted and revised the article, approved the published version, and agreed to be accountable for all aspects of the work.

Conflict of interest

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

References

Alder, S. (2023, December 23). *Effects of poor communication in healthcare.* The HIPAA Journal. https://www.hipaajournal.com/effects-of-poor-communication-in-healthcare/

BBC News, Thai. (2022). *Myanmar people "flee the heat to the cold": Does Thailand's migrant worker management policy address the shortage?* United Kingdom: BBC. https://www.bbc.com/thai/thailand-62439039

Chuah, F. L. H., Tan, S. T., Yeo, J., & Legido-Quigley, H. (2018). The health needs and access barriers among refugees and asylum-seekers in Malaysia: A qualitative study. *International Journal for Equity in Health*, 17(1), 120. https://doi.org/10.1186/s12939-018-0833-x

Diekelmann, N., Allen, D., & Tanner, C. (1989). *The NLN criteria for appraisal of baccalaureate programs: A critical hermeneutic analysis.* NLN Press.

Ministry of Labor. (2021). *Report on the situation of international labor economy and international labor mobility: First quarter.* Bangkok, Thailand: Office of Permanent Secretary for Ministry of Labor. http://warning.mol.go.th/uploadFile/pdf/pdf-2022-08-29-1661761146.pdf

Fang, M. L., Sixsmith, J., Lawthom, R., Mountian, I., & Shahrin, A. (2015). Experiencing 'pathologized presence and normalized absence'; understanding health related experiences and access to health care among Iraqi and Somali asylum seekers, refugees and persons without legal status. *BMC Public Health*, *15*(1), 923. https://doi.org/10.1186/s12889-015-2279-z

Foreign Workers Administration Office. (2021a*). Guide to applying for work permits of foreign workers for employers of establishments.* Bangkok, Thailand: Department of Employment. https://www.doe.go.th/prd/assets/upload/files/alien_th/96dd0f4c136f52018cc9700f067f0377.pdf

Foreign Workers Administration Office. (2021b). *The situation of migrant workers.* Bangkok, Thailand: Department of Employment. https://www.doe.go.th/prd/alien?page=home

Funge, J., & Boye, M. (2020). "No papers. no doctor": A qualitative study of access to maternity care services for undocumented immigrant women in Denmark. *International Journal of Environmental Research and Public Health*, 17(18), 6503. https://doi.org/10.3390/ijerph17186503.

Heidegger, M. (2019). *Being and time.* Wydawca: Martino Publishing.

Hfocus. (2023). *Dealing with emergency critical illnesses of foreigners who are not included in health insurance in Thailand.* https://www.hfocus.org/content/2018/04/15708

Inciso, J. (2021). *Common patient communication problems and how to solve them.* https://blog.curogram.com/solve-patient-communications-problems

Information Center for Contacting Government Officials. (2023). *Foreigners' working-permit application.* Bangkok, Thailand: Digital Government Development Agency (Public Organization) (DGA). https://info.go.th

Jongudomkarn, D., Phupaibul, R., & Niemsap, T. (2019). Isan family well-being: Suffering and happiness on poverty. *Journal of Nursing Sciences and Health*, *42*(2), 62–73. https://he01.tci-thaijo.org/index.php/nah/article/view/167197

Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry.* Sage Publications.

Pandey, M., Maina, R. G., Amoyaw, J., Li, Y., Kamrul, R., Michaels, C. R., & Maroof, R. (2021). Impacts of English language proficiency on healthcare access, use, and outcomes among immigrants: A qualitative study. *BMC Health Services Research*, *21*(1), 741. https://doi.org/10.1186/s12913-021-06750-4

Phetsaen, S., & Haritavorn, N. (2019). Accessibility of antenatal care and labour services among Myanmar migrant workers at one hospital in Pathum Thani province. *ChiangRai Medical Journal*, *11*(2), 75–84. http://49.231.15.21/deptw5/upload/files/odkF25631201185903396l.pdf

Poonpoksin, W. (2018). Health insurance for protecting migrant workers: points of view from social capital of Thailand. *Journal of Social Work*, 26(1), 1–33. https://so04.tci-thaijo.org/index.php/swjournal/article/view/168084

PPTV Online. (2020). *Where are the 2.5 million migrant workers and what do they do? Focus on Bangkok - Samut Prakan, the area adjacent to "Samut Sakhon" 21 Dec 2020.* Bangkok

Media and Broadcasting Company Limited. https://www.pptvhd36.com/news/เศรษฐกิจ/138715

Rajavithi Hospital. (2022). *Migrant worker inspection program at Rajavithi Hospital.* Bangkok, Thailand: Rajavithi Hospital. https://www.rajavithi.go.th/rj/?page_id=1330

Rangel, G. M. G., López, J. A. M., Svarch, A., Tonda, J., Lara, J., Anderson, E. J., & Rosales, C. B. (2019). Together for health: An initiative to access health services for the Hispanic/Mexican population living in the United States. *Frontiers in Public Health*, *7,* 273. https://doi.org/10.3389/fpubh.2019.00273

Reddy, R., Welch, D., Lima, I., Thorne, P., & Nosa, V. (2019). Identifying hearing care access barriers among older Pacific Island people in New Zealand: A qualitative study. *BMJ Open*, *9*(8), e029007. https://doi.org/10.1136/bmjopen-2019-029007

Sangsrijan, S., Limchaiarunruang, S., & Chaibarn, P. (2016). Perception and utilization of benefit packages of health coverage among migrant workers in upper northern Thailand. *Journal of Nursing and Health Care*, 28(2). https://he01.tci-thaijo.org/index.php/jnat-ned/article/view/69153

Simons K, Bradfield O, Spittal MJ, King T. (2023). Age and gender patterns in health service utilisation: Age-period-cohort modelling of linked health service usage records. *BMC Health Services Research, 23*(1), 480. https://doi.org/10.1186/s12913-023-09456-x

Sittikan, S., & Jongudomkarn, D. (2020). Barriers to access of primary healthcare by people with low income in urban communities: a qualitative study. *Journal of Nursing Science & Health*, *43*(1), 19–29. https://he01.tci-thaijo.org/index.php/nah/article/view/204857

Social Security Office. (2023). *Social security: "Entry into the social security system of foreign workers".* Bangkok, Thailand: Department of Employment. Retrieved from: https://www.doe.go.th/prd/assets/upload/files/nakhonnayok_th/9e5fa4c6f2fe905cb1bb17cedf03273b.pdf

SONIFI Health. (2023). *Positive distraction. The power of the familiar in an unfamiliar place.* Los Angeles, CA: SONIFI® Health Incorporated. https://www.sonifihealth.com/the-power-of-the-familiar-in-an-unfamiliar-place/

Sritiang, N. (2021). *Migrant workers and access to health benefits in the Thai state: A case study of migrant workers, Samut Sakhon Province*. Bangkok, Thailand: Amnesty International Thailand. https://www.amnesty.or.th/latest/blog/921/

Sutapuk, U. (2019). *Development of guidelines for the management and health service systems for migrant workers in Thailand. Complete research report, project set "Promotion and support plan of research aimed at meeting national development needs for fiscal year 2017: ASEAN Community"* National Research Council of Thailand and Thailand Research Fund. https://digital.library.tu.ac.th/tu_dc/frontend/Info/item/dc:167540

Thai Civil Rights and Investigative Journalism. (2017). *Thailand bears 400-500 million Baht per year for humanitarian treatment: Proposing a specific budget.* TCIJ. https://www.tcijthai.com/news/2017/10/scoop/7576

Thalerngpol, P. (2020). The effectiveness of health insurance system management of alien manual laborer groups in Samut Sakhon Province. *Journal of Social Science and Buddhistic Anthropology, 5*(1), 254-267.

The World Bank. (2018). *Global migration can be a potent tool in the fight to end poverty across the world-new report.* NW Washington, DC: The World Bank. https://www.worldbank.org/en/news/press-release/2018/06/14/global-migration-can-be-a-potent-tool-in-the-fight-to-end-poverty-across-the-world-new-report

Thomson, S., Cylus, J., & Evetovits, T. (2019). *Can people afford to pay for health care?* World Health Organization. https://apps.who.int/iris/bitstream/handle/10665/311654/9789289054058-eng.pdf?sequence=1&isAllowed=y

Vichanjalearnsuk, V., & Chaimanee. A. (2015). Syphilis among expatriates participating in health check-up for registration for employment at occupational medicine clinic, Nopparat Rajathanee Hospital. *The Public Health Journal of Burapha University, 10*(2), 26-33.

World Health Organization. (2023). *Migration and health: enhancing intercultural competence and diversity sensitivity.* World Health Organization. https://apps.who.int/iris/bitstream/handle/10665/332186/9789289056632-eng.pdf

NurseMedia
JOURNAL OF NURSING

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):65-73, April 2024
https://doi.org/10.14710/nmjn.v14i1.50955

ORIGINAL RESEARCH

Nurses' Knowledge on the Prevention of Ventilator-Associated Pneumonia (VAP) among Critically Ill Patients

Maha Sanat Alreshidi[1], Fareda Ali AlRashidi[2], Cyruz P. Tuppal[3], Denise Angelo M. Prudencio[4], Nojoud Alrashidi[5], Rico William A. Villagracia[6], Hazel N. Villagracia[6]

[1]Nursing Administration Department; College of Nursing, University of Ha'il, Ha'il, Kingdom of Saudi Arabia
[2]Health Affairs, Qassim, Kingdom of Saudi Arabia
[3]College of Nursing, MAPUA Malayan Colleges Laguna, Philippines
[4]Department of Nursing, Kaiser Permanente, Sacramento Medical Center, Sacramento, California, USA
[5]Maternal and Child Nursing Department, College of Nursing, University of Ha'il, Ha'il, Kingdom of Saudi Arabia
[6]Medical Surgical Nursing Department, College of Nursing, University of Ha'il, Ha'il, Kingdom of Saudi Arabia

Article Info

Article History:
Received: 16 December 2022
Revised: 22 April 2024
Accepted: 23 April 2024
Online: 30 April 2024

Keywords:
Critically ill patients; knowledge; nurses; prevention of Ventilator-Associated Pneumonia (VAP); ventilator bundle checklist

Corresponding Author:
Cyruz P. Tuppal
College of Nursing, MAPUA Malayan Colleges Laguna, Philippines
Email: cptuppal@up.edu.ph; drcyruz@gmail.com

Abstract

Background: Ventilator-associated pneumonia (VAP) is a significant concern in healthcare settings, particularly among critically ill patients who require mechanical ventilation. Nurses play a vital role in preventing VAP through their knowledge and implementation of evidence-based practices. However, there exists a notable gap in the research regarding nurses' knowledge of preventing VAP to improve patient outcomes and reduce healthcare costs.
Purpose: This study aimed to assess nurses' knowledge of preventing VAP among critically ill patients using the ventilator bundle checklist.
Methods: This study used a one-group pretest-posttest design to test the change in the nurses' knowledge scores on VAP working in two government hospitals in Buraidah, Al Qassim Region, Saudi Arabia. The study covered 250 purposively and conveniently sampled nurses from intensive care units. Data collection was performed in three phases: pre-test, VAP educational program, and post-test. Data were collected using self-administered questionnaires on nurses' socio-demographics, a 20-item self-made survey about the knowledge of VAP and its prevention and the adapted ventilator bundle checklist. The collected data were entered, prepared, and analyzed using SPSS version 25.0. Relevant ethical issues were strictly considered.
Results: The results showed that during the pre-test, correct responses were accounted for but showed low scores in the following areas: general knowledge of VAP (27.6%), factors associated with VAP (36%), international guidelines for prevention (20.8%), and nurses' roles in prevention (16.4%). However, in the post-test, there was a remarkable increase in the knowledge scores in the same categories (95.2%) on general knowledge, on factors associated with VAP (74.8%), on international guidelines (73.6%) and on nurses' roles in prevention (61.6%). The program significantly improved overall VAP knowledge and knowledge in specific areas like general VAP, associated factors, international guidelines, and nurses' roles in prevention ($p<0.000$).
Conclusion: A pre-test revealed low baseline knowledge across all four areas assessed: general VAP knowledge, factors associated with VAP, international VAP prevention guidelines, and nurses' roles in VAP prevention. However, post-test scores markedly increased in all areas, indicating the educational program's effectiveness. Hence, the findings suggest that educational intervention focused on VAP screening and bundle protocols could be beneficial to address the gap in knowledge on VAP.

How to cite: Alreshidi, M. S., AlRashidi, F. A., Tuppal, C. P., Prudencio, D. A. M., Alrashidi, N., Villagracia, R. W. A., & Villagracia, H. N. (2024). Nurses' knowledge on the prevention of ventilator-associated pneumonia (VAP) among critically ill patients. *Nurse Media Journal of Nursing, 14*(1), 65-73. https://doi.org/10.14710/nmjn.v14i1.50955

1. Introduction

Ventilator-associated pneumonia (VAP) is a lung infection that develops in a patient hooked to a ventilator machine after 48 hours (Centers for Disease Control and Prevention, 2021). VAP is one of the most notable intensive care unit (ICU)-acquired infections and the leading cause of death among patients admitted to intensive care units (Kharel et al., 2021). A ventilator machine that helps a patient breathe by providing oxygen can be a portal of infection if germs enter the tube and reach the patient's lungs. The primary risk factor for VAP among critically ill patients is endotracheal (ET) intubation. The ET tube breaks the airway defenses, and mucociliary clearance impairs cough and facilitates the microaspiration of bacteria-laden secretions that pool above the endotracheal tube cuff. Thus, the highest risks of VAP occur during the first 10 days after intubation. Traditional signs and symptoms of VAP among ventilated patients are typically fever, leukocytosis, changes in a respiratory parameter such as worsening hypoxemia and purulent secretions, and chest X-ray showing new or progressive diffuse infiltrate (Papazian et al., 2020; World Health Organization, 2021).

The diagnostic triad for the presence of VAP is a pulmonary infection accompanied by fever, purulent secretions, leukocytosis, bacteriologic evidence of pulmonary disease, and radiologic suggestions of pulmonary infection. There was 69% sensitivity in diagnosing and 75% specificity of VAP when the combination of radiologic infiltrates and 2 clinical criteria were observed in patients hooked in mechanical ventilators (Abad et al., 2021; Al Aswad & Bayoumi, 2022; Dipanjali et al., 2020; Getahun et al., 2022; Jakhar et al., 2023). Concomitantly, diagnosing VAP requires high clinical precision through microbiologic analysis of respiratory secretions, radiologic examination, and focused physical examination. In addition, performing semi-quantitative cultures of endotracheal aspirates and gram stains is recommended for guiding treatment among patients who develop VAP (Centers for Disease Control and Prevention, 2021).

According to the World Health Organization (2021), VAP is the most common hospital-acquired infection among mechanically ventilated patients. Similarly, approximately 28% of patients who receive mechanical ventilation develop VAP. The incidences vary extensively from 5% to 40%, depending on the diagnostic criteria and setting. Thus, prolonged hospital stays and duration of mechanical ventilation are associated with VAP (Papazian et al., 2020). Additionally, there was an estimated 10% mortality of VAP, which is higher death rates from patients in surgical ICU and with mid-range severity scores among patients at admission.

Undeniably, preventing VAP among ventilated patients remains a major clinical challenge associated with high morbidity, mortality, high hospital cost, and increased length of hospital stay (Subramanian et al., 2013). VAP prevention begins during intubation and must be continued until the extubation of critical patients. Thus, nurses need an extensive understanding of the strategies to develop VAP among ventilated patients. For this reason, critical care nurses play an essential role in VAP prevention. Nurses need to recognize the earliest signs and symptoms, reduce the risk factors, and assist in diagnosing VAP in patients hooked to a mechanical ventilator. Also, critical care nurses must adhere to evidence-based guidelines to prevent VAP and consistently translate evidence-based findings care to ventilated patients. The Centers for Disease Control and Prevention (2021) provides the healthcare community with guidelines and tools, such as the bundle checklist for nurses to help eradicate VAP cases. The Institute for Healthcare Improvement (IHI, 2021) introduced a bundle checklist as a straightforward set of evidence-based practices that are proven effective. There are five components of the VAP bundle from IHI, namely (1) head-of-bed elevation between 30 and 45 degrees; (2) a daily "sedation vacation" and a readiness-to-wean assessment; (3) peptic ulcer disease prophylaxis; (4) deep vein thrombosis prophylaxis; and (5) daily oral care with chlorhexidine (a new intervention added since 2010) (Al-Tawfiq & Abed, 2010; Benson et al., 2013; Papazian et al., 2020).

Nurses play a vital role in preventing VAP. However, a research gap exists in the study of nurses' knowledge of preventing VAP, which must be addressed to improve patient outcomes and reduce healthcare costs. While studies have examined nurses' overall understanding of infection control practices, few studies have specifically explored their knowledge of VAP prevention (Abad et al., 2021), which limits the understanding of the specific areas where nurses may be lacking in knowledge and the potential interventions that can be implemented to address these gaps. Another research gap is the lack of studies utilizing a one-group pretest-posttest design to evaluate changes in nurses' knowledge after educational interventions. This design allows for the assessment of knowledge improvement within the same group of nurses before and after an intervention, providing valuable insights into the effectiveness of educational programs. Using this design, researchers can determine if educational interventions significantly impact nurses' knowledge and identify areas where further improvement is needed.

Additionally, studies are needed to explore the factors influencing nurses' knowledge of VAP prevention. Understanding these factors can help identify barriers and facilitators to implementing evidence-based practices and inform strategies to improve nurses' knowledge in this area (Sanketh et al., 2023). Factors such as educational background, years of experience, and access to resources may all play a role in nurses' knowledge of VAP prevention (Getahun et al., 2022; Yin et al., 2022). Studying these variables can provide valuable insights for nurse educators and policymakers. Lastly, there is a gap in research on the long-term sustainability of knowledge gained through educational interventions. While many studies focus on immediate improvements in knowledge after an intervention, there is limited evidence on whether this knowledge is retained over time. Longitudinal studies that follow nurses after an educational intervention can provide insights into the long-term impact of education on nurses' knowledge and inform strategies for ongoing education and support (Jakhar et al., 2023).

Undeniably, it is essential to improve clinical outcomes among mechanically ventilated patients to reduce the development of VAP. A bundle was formulated to reduce morbidity and mortality among patients hooked to a mechanical ventilator. Existing studies have proven the efficacy of VAP bundles globally (Al-Tawfiq & Abed, 2010) but not in the Kingdom of Saudi Arabia. For this reason, this study hopes to offer a novel approach to assimilating knowledge, contributing to a more scientific and evidence-based practice that yields safe, efficient, and quality patient care and healthcare outcomes. Therefore, this study aimed to assess nurses' knowledge of preventing VAP among critically ill patients using the ventilator bundle checklist.

2. Methods

2.1. Research design

The study utilized a one-group pretest-posttest design, a quasi-experiment in which the outcome of interest is measured two times: once before and once after exposing a non-random group of participants to a specific intervention/treatment (Reichardt, 2019). This study design offers several advantages. Firstly, it can be conducted with a relatively small sample size, making it more feasible and cost-effective. Secondly, it establishes a temporal relationship between the intervention and the observed effects because the outcome is measured after the intervention. This temporal relationship is crucial for inferring causality (Hyman, 1982; Reichardt, 2019).

2.2. Setting and samples

The study was conducted at two (2) government hospitals in Buraidah, Al Qassim Region, Saudi Arabia. These government hospitals have a 500-bed capacity supervised by the Ministry of Health. Due to their size and location, they serve a significant portion of the population, potentially leading to a more representative sample. The sample size was calculated using Raosoft software based on a 2,000 random samples with a 5% margin of error, 95% confidence interval (CI) , which yielded a required sample size of 357 (Raosoft, 2004). Two hundred fifty (250) nurses working in critical care units who provide direct care to mechanically ventilated patients participated in the study. Meanwhile, 107 nurses whose years of experience were less than six months and who refused to participate were excluded.

2.3. Intervention

In this study, the researchers developed a structured educational program for registered nurses caring for mechanically ventilated patients in the ICU with an end view to improve nurses' knowledge and confidence in applying evidence-based practices to prevent VAP in critically ill patients. The two-tiered interventions consisted of the following: Part 1 offered a didactic lecture delivered by an ICU physician and experienced nurse educator who covered VAP definition, risk factors, prevention bundle elements, and recommended practices for hand hygiene, oral care, ventilator circuit care, and suctioning. Interactive elements, including polls and case studies, were incorporated to enhance engagement. Part 2 provided a hands-on skills demonstration focusing on proper preventive measures, including hand hygiene techniques, and simulated ventilator circuit care and suctioning procedures using mannequins or training models, which lasted two to three hours. Lastly, handouts summarized critical points from the lecture with visuals (i.e., diagrams, flowcharts), demonstration checklists for VAP prevention practices, and links to relevant articles and resources on VAP prevention from credible sources (e.g., the Centers for Disease Control and Prevention (CDC) guidelines).

2.4. Measurement and data collection

A self-made socio-demographic questionnaire was used to obtain descriptive variables of critical care nurses under study. A self-constructed 20-item tool about understanding VAP and its prevention was also used. Three subject matter experts evaluated and verified the content of the test questions (CVI=0.98; S-CVI=0.98 and I-CVI=0.98). Items in the questionnaire were subjected to content analysis and pre-testing to ensure validity, resulting in a 0.89 acceptable kappa value. Five (5) items were excluded from the study due to their inconsistency and inapplicability. When corrections were integrated, the final questionnaire was prepared and disseminated. The total knowledge score was summed up to give the total knowledge score with the following formula (mean score/total number of items multiplied by 100).

This study also used the ventilator bundle checklist. The original English version of the ventilator bundle observation checklist was adapted from the Centers for Disease Control and Prevention (CDC, 2021) and the Institute for Healthcare Improvement (IHI, 2021). This observation checklist comprised five (5) important elements based on the adapted ventilator bundle: (1) head-of-bed elevation- a semi-recumbent position that could be achieved by elevating the head of the bed to an angle of 30–45 degrees; (2) daily sedation hold; (3) peptic ulcer disease prophylaxis using pantoprazole or ranitidine, as prescribed by the physician; (4) DVT prophylaxis via administration of subcutaneous heparin or enoxaparin (Clexane) and application of anti-embolism stockings such as thromboembolic deterrent stockings as prescribed; and (5) daily oral care with the help of a suction toothbrush and chlorhexidine gluconate 0.05%. The kappa value was acceptable at 0.87 (McHugh, 2012).

Data collection was performed in three phases. In phase I, a pre-test session was conducted for all nurses who participated in the study to assess the level of knowledge of nurses on VAP and the ventilator bundle checklist. The pre-test used a self-constructed 20-item tool about the understanding of VAP and its prevention using a ventilator bundle to test the pre-intervention knowledge level of the group. Thus, critical care experts verified the test questions' content. Phase II involved the structured educational intervention, which was provided after the completion of pre-test evaluations. Phase III, comprised of the post-test evaluation, was carried out among all nurses who participated in the study after the educational intervention. The researchers used several data-gathering instruments to collect significant data associated with nurses' knowledge of preventing VAP using a ventilator bundle checklist among critically ill patients.

2.5. Data analysis

Data were entered in the statistical analysis software (SPSS) version 26 (IBM Corporation, 2013). Frequencies and percentages were used, and inferential statistics were used to analyze the data paired sample t-test statistical test to measure the difference in the mean VAP knowledge score before and after the implementation of the education program. A p-value less than 0.05 was considered significant. Participants' demographics, such as gender, age, academic degree, and nursing specialization, were presented in frequencies and percentages.

2.6. Ethical considerations

The researchers ensured adherence to ethical guidelines by obtaining approval from the Regional Ethics Committee of the Ministry of Health, Buraidah, Qassim, with approval number H-04-Q-001 and the hospital authorities. All data collection adhered to hospital protocols and research ethics. Participant confidentiality was prioritized; data were anonymized, and informed consent was obtained after thoroughly explaining the study's purpose and nature. Participants were also assured of their right to withdraw and decline to answer specific questions.

3. Results

3.1. Profile characteristics of the nurses

In this study, 250 nurses working in different ICUs at two government hospitals in Buraidah, Al Qassim Region, Saudi Arabia, were given the questionnaire. Results indicate that nurses who participated in this study were 32-41 years old (n=103, 41.2%), females (n=144, 57.6%). A majority of them were married (n=139), and 55.6% earned > 10000 Saudi Riyal. Regarding their education, the majority earned their Bachelor of Science in Nursing (n=122), or 31.2%, and had between 5 to 10 years of experience (n=90), or 36.0% (Table 1).

Table 1. Profile characteristics of the nurses

Profile Characteristics		Frequency	Percentage
Age	21 – 31	92	36.8
	32 – 41	103	41.2
	42 – 51	55	22.0
Gender	Female	144	57.6
	Male	106	42.4
Marital status	Single	106	42.4
	Married	139	55.6
	Divorced	3	1.2
	Widowed	2	0.8
Monthly family income	<5000 Saudi Riyal	39	15.6
	5001 - 10000 Saudi Riyal	78	31.2
	>10000 Saudi Riyal	133	53.2
Education	Diploma	89	35.6
	Bachelor	122	48.8
	Master	39	15.6
Work experience	6 months - 1 year	12	4.8
	1 - 5 years	77	30.8
	5 - 10 years	90	36.0
	> 10 years	71	28.4

3.2. Nurses' knowledge of VAP

Table 2 shows that the scores during the pre-test had generally low scores in the following areas: general knowledge of VAP (n=69, 27.6%), factors associated with VAP (n=90, 36%), international guidelines for prevention (n=52, 20.8%), and nurses' roles in prevention (n=41, 16.4%). On the contrary, in the post-test, there was a remarkable increase in the knowledge scores. Nurses correctly answered 238 (95.2%) questions on general knowledge, 187 (74.8%) on factors associated with VAP, 154 (61.6%) on international guidelines, and 184 (73.6%) on nurses' roles in prevention.

Table 2. Nurses' knowledge of VAP in two government hospitals

Question Items	Pre-test				Post-test			
	Correct Responses		Incorrect Responses		Correct Responses		Incorrect Responses	
	f	%	f	%	f	%	f	%
General Knowledge of VAP	69	27.6	181	72.4	238	95.2	12	4.8
Knowledge of Factors Associated with VAP	90	36	160	64	187	74.8	63	25.2
Knowledge of International Guidelines for VAP Prevention	52	20.8	198	79.2	154	61.6	96	38.4
Knowledge of Nurses' Roles in Preventing VAP	41	16.4	209	83.6	184	73.6	66	26.4

3.3. Nurses' knowledge before and after the intervention

Results in Table 3 indicate a statistically significant difference in the general understanding of VAP (t=-46.077, *p*=0.000), knowledge of factors associated with VAP (t=-41.945, *p*=0.000), knowledge of international guidelines for VAP Prevention (t=-26.624, *p*=0.000), and knowledge of nurses' roles in preventing VAP (t=-36.032, *p*=0.000) during the pre-test and post-test intervention.

4. Discussion

Due to the research gap identified in the corpora, this study assessed nurses' knowledge of VAP, focusing on the following areas: general knowledge of VAP, knowledge of factors associated with VAP, knowledge of international guidelines for VAP, and knowledge of nurses' roles in preventing VAP. In most recent studies, nurses have been identified as the key participants as they provide direct care and involvement in the prevention of VAP-related cases, primarily in the ICUs (Abad et al., 2021; Dipanjali et al., 2020; Getahun et al., 2022; Jakhar et al., 2023). The present study found that more than half of the participants had between 5 and 10 years of experience. Nurses with more extended experience in the ICU (i.e.,> 4 years) were more likely to have undergone VAP bundle training, concurring with the study conducted by Abad et al. (2021). However, nurses' knowledge appeared similar to that of less experienced nurses, which differs from published data. In one study, for example, the average knowledge level was higher among more experienced ICU nurses (> 1 year experience) and those holding a remarkable degree in emergency and intensive care.

Table 3. Significant difference in the overall mean scores of nurses' knowledge of VAP during the pre-test and post-test intervention

Key Areas of Evaluation	Pre-test		Post-test			
	M	SD	M	SD	T	p-value
General Knowledge of VAP	1.04	0.87	4.12	0.80	-46.08	0.00
Knowledge of Factors Associated with VAP	1.27	0.98	4.06	0.88	-41.95	0.00
Knowledge of International Guidelines of VAP	0.80	0.81	2.62	1.06	-26.62	0.00
Knowledge of Nurses' Roles in preventing VAP	1.26	1.02	3.89	0.95	-36.03	0.00

Note. M=Mean; SD=Standard Deviation; *p<0.05.; **p<0.01.; ***p<0.001

The pre-test knowledge scores show that many nurses lacked a strong understanding of VAP, including its associated factors, preventative guidelines, and their role in preventing it. Similarly, in other studies, poor knowledge regarding VAP prevention during the pre-intervention has also been reported in other studies published in Iran (Bagheri-Nesami & Amiri, 2014), Yemen (Al-Sayaghi, 2014), and Taiwan (Lin et al., 2014) in Asia, Egypt (Ali, 2013) and Ethiopia (Wami et al., 2018). On the other hand, the post-test results show a significant improvement in knowledge following the educational intervention. In other studies conducted in Spain, for instance, Gatell et al. (2012) found that nurses' knowledge of VAP preventive measures has significantly increased post-intervention. In India, Sahni et al. (2017) surmised that the educational intervention improved ICU nurses' scientific knowledge about measures related to VAP prevention. Hamishehkar et al. (2014) agreed that nurses' knowledge of the ventilator bundle checklist improved after the training program.

According to Oner Cengiz and Kanan (2019), training programs effectively increase nurses' knowledge of VAP, its associated factors, and the preventative measures outlined in international guidelines. Mishra and Rani (2020) posited that nurses should monitor patients closely for signs of infection, including fever, increased sputum production, and changes in respiratory status, and report any concerns promptly. Education and training are crucial in enhancing nurses' knowledge and skills in preventing VAP, as depicted in the present study's post-intervention results. Several recently published studies support our study findings (Abad et al., 2021; Dipanjali et al., 2020; Getahun et al., 2022; Oner Cengiz & Kanan, 2019). However, it should be noted that the differences in healthcare delivery models in intensive care units and the lack of differences in specific guidelines and policies regarding training and practice of VAP prevention in ICUs may explain the differences in knowledge scores (Yin et al., 2022).

Therefore, healthcare organizations should invest in developing and implementing comprehensive training programs covering the latest evidence-based VAP prevention practices (Dipanjali et al., 2020). The program may include regular updates on guidelines, hands-on workshops, and simulations to enhance nurses' understanding and proficiency. Continuous education ensures that nurses stay up-to-date with advancements in VAP prevention strategies and fosters a culture of continuous learning and improvement. Several authors suggested that policymakers and hospital administrators should prioritize implementing and updating evidence-based VAP prevention guidelines (Abad et al., 2021; Getahun et al., 2022; Oner Cengiz & Kanan, 2019) to improve the quality of nursing care by empowering nurses to make informed decisions regarding patient care and reduce ventilator-associated pneumonia (VAP) rates. For nursing education institutions, Mishra and Rani (2020) highlighted that nursing deans should revise undergraduate nursing curricula to incorporate acute care initiatives and explicitly focus on VAP prevention strategies.

5. Implications and limitations

Preventing VAP requires a multi-pronged approach that involves various strategies. Nurses must prioritize hand hygiene and follow strict infection control protocols to minimize the transmission of pathogens. They should also ensure proper oral care for ventilated patients, as oral bacteria can migrate to the lungs and cause infection. Maintaining proper patient positioning, including elevating the head of the bed and encouraging mobility, helps prevent aspiration and reduce the risk of VAP. On the other hand, owing to the limitations of this study, without a control group, it is impossible to isolate the effect of the educational program. Other factors might have influenced the nurses' knowledge gain. The one-group design with a potentially small sample size makes it challenging to know if the results apply to a broader population of nurses.

6. Conclusion

Nurses' knowledge of VAP prevention improved significantly following an educational intervention. A pre-test revealed low baseline knowledge across all four areas assessed: general VAP knowledge, factors associated with VAP, international VAP prevention guidelines, and nurses' roles in VAP prevention. However, post-test scores markedly increased in all areas, indicating the educational program's effectiveness. Hence, the findings suggest that educational interventions focused on VAP screening and bundle protocols could be beneficial. Further research with a more robust design (e.g., pre-test/post-test with a control group) is needed to confirm this.

Acknowledgment

We express our utmost gratitude to the nurse participants and the University of Hail after Ethics approval from the Ministry of Health, Buraidah, Qassim Region (approved on December 13, 2021).

Author contribution

MSA, FAA, NA: conceptualization and data collection; CPT, HNV, DAP, RAV: data analysis and manuscript preparation.

Conflict of interest

The authors declare that there are no conflicts of interest.

References

Abad, C. L., Formalejo, C. P., & Mantaring, D. M. L. (2021). Assessment of knowledge and implementation practices of the ventilator acquired pneumonia (VAP) bundle in the intensive care unit of a private hospital. *Antimicrobial Resistance & Infection Control*, *10*(1), 161. https://doi.org/10.1186/s13756-021-01027-1

Al-Sayaghi, K. M. (2014). Prevention of ventilator-associated pneumonia. *Saudi Medical Journal*, *35*(3), 269-276. https://smj.org.sa/content/smj/35/3/269.full.pdf

Al-Tawfiq, J. A., & Abed, M. S. (2010). Decreasing ventilator-associated pneumonia in adult intensive care units using the institute for healthcare improvement bundle. *American Journal of Infection Control*, *38*(7), 552-556. https://doi.org/10.1016/j.ajic.2010.01.008

Al Aswad, Z., & Bayoumi, M. (2022). Improvement of the nurses' awareness toward ventilator-associated pneumonia based on evidence guidelines. *Indian Journal of Medical Specialities*, *13*(2), 95-100. https://doi.org/10.4103/injms.injms_124_21

Ali, N. S. (2013). Critical care nurses' knowledge and compliance with ventilator associated pneumonia bundle at Cairo university hospitals. *Journal of Education and Practice*, *4*(15), 66-78. https://www.iiste.org/Journals/index.php/JEP/article/view/6821

Bagheri-Nesami, M., & Amiri, M. (2014). Nurses' knowledge of evidence-based guidelines for preventing ventilator-associated pneumonia in intensive care units. *Journal of Nursing and Midwifery Sciences*, *1*(1), 44-48. https://doi.org/10.18869/acadpub.jnms.1.1.44

Benson, S., Johnson, A., & Petera, C. (2013). VAP Free for 1000 days, it can be done. *Critical Care Nursing Quarterly*, *36*(4), 421-424. https://doi.org/10.1097/CNQ.0b013e3182a1eb01

Centers for Disease Control and Prevention. (2021). *Ventilator-associated pneumonia*. https://www.cdc.gov/hai/vap/vap.html

Dipanjali, R., Shivananda, P. M., & Yashoda, S. (2020). Effectiveness of an educational intervention on knowledge and practice of staff nurses on prevention of ventilator associated pneumonia among neonates in neonatal intensive care unit. *International Journal of Caring Sciences*, *13*(2), 1421-1430.

Gatell, J., Rosa, M., Sante Roig, M., Hernandez Vian, O., Carrillo Santin, E., Turegano Duaso, C., Fernandez Moreno, I., & Valles Daunis, J. (2012). Assessment of a training programme for the prevention of ventilator-associated pneumonia. *Nursing in Critical Care*, *17*(6), 285-292. https://doi.org/10.1111/j.1478-5153.2012.00526.x

Getahun, A. B., Belsti, Y., Getnet, M., Bitew, D. A., Gela, Y. Y., Belay, D. G., Terefe, B., Akalu, Y., & Diress, M. (2022). Knowledge of intensive care nurses' towards prevention of ventilator-associated pneumonia in North West Ethiopia referral hospitals, 2021: A multicenter, cross-sectional study. *Annals of Medicine and Surgery*, *78*, 103895. https://doi.org/10.1016/j.amsu.2022.103895

Hamishehkar, H., Vahidinezhad, M., Mashayekhi, S. O., Asgharian, P., Hassankhani, H., & Mahmoodpoor, A. (2014). Education alone is not enough in ventilator associated pneumonia care bundle compliance. *Journal of Pharmacy Practice and Research*, *3*(2), 51-55. https://doi.org/10.4103/2279-042x.137070

IBM Corporation. (2013). *IBM SPSS statistics for windows*. In IBM Corp.

Jakhar, F., Rao, P., & Shenoy, S. (2023). Impact on approach of ICU staff towards ventilator care bundles and infection control practices in prevention of ventilator associated pneumonia in a tertiary care hospital. *Biomedicine*, *43*(4), 1266-1269. https://doi.org/10.51248/.v43i4.2600

Kharel, S., Bist, A., & Mishra, S. K. (2021). Ventilator-associated pneumonia among ICU patients in WHO Southeast Asian region: A systematic review. *Plos One*, *16*(3), e0247832. https://doi.org/10.1371/journal.pone.0247832

Lin, H.-L., Lai, C.-C., & Yang, L.-Y. (2014). Critical care nurses' knowledge of measures to prevent ventilator-associated pneumonia. *American Journal of Infection Control*, *42*(8), 923-925. https://doi.org/10.1016/j.ajic.2014.05.012

McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica*, *22*(3), 276-282. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3900052/

Mishra, R., & Rani, N. (2020). Effectiveness of structured teaching program on knowledge and practice regarding care bundle on prevention of ventilator-associated pneumonia among nurses. *International Archives of Nursing and Health Care*, *6*(4), 149-153. https://doi.org/10.23937/2469-5823/1510149

Oner Cengiz, H., & Kanan, N. (2019). The effectiveness of training given to nurses for reducing ventilator-associated pneumonia in intensive care patients. *Developments in Health Sciences*, *2*(2), 36-45. https://doi.org/10.1556/2066.2.2019.006

Papazian, L., Klompas, M., & Luyt, C.-E. (2020). Ventilator-associated pneumonia in adults: A narrative review. *Intensive Care Medicine*, *46*(5), 888-906. https://doi.org/https://doi.org/10.1007/s00134-020-05980-0

Raosoft, Inc. (2004). Raosoft Sample size calculator. http://www.raosoft.com/samplesize.html

Sahni, N., Biswal, M., Gandhi, K., Kaur, K., Saini, V., & Yaddanapudi, L. N. (2017). Effect of intensive education and training of nurses on ventilator-associated pneumonia and central line-associated bloodstream infection incidence in intensive care unit at a tertiary care center in North India. *Indian Journal of Critical Care Medicine* *21*(11), 779. https://doi.org/10.4103/ijccm.IJCCM_259_17

Sanketh, R., Sankar, B., Chandran, J., & James, E. J. G. (2023). Ventilator-associated pneumonia. *Journal of Pediatric Critical Care*, *10*(4), 163-170. https://doi.org/10.4103/jpcc.jpcc_49_23

Subramanian, P., Choy, K. L., Gobal, S. V., Mansor, M., & Ng, K. H. (2013). Impact of education on ventilator-associated pneumonia in the intensive care unit. *Singapore Medical Journal*, *54*(5), 281-284. https://doi.org/10.11622/smedj.2013109

Wami, G. A., Mengistu, D., & Gudisa, G. G. (2018). Knowledge, practice and associated factors of adult intensive care nurses' on prevention of ventilator associated pneumonia in Addis Ababa Public Hospitals. *International Journal of Clinical Dermatology*, *1*(1), 15-21. https://doi.org/10.11648/j.ijcd.20180101.14

World Health Organization. (2021). *Pneumonia, ventilator-associated.* https://apps.who.int/iris/browse?authority=Pneumonia%2C+Ventilator-Associated&type=mesh

Yin, Y., Sun, M., Li, Z., Bu, J., Chen, Y., Zhang, K., & Hu, Z. (2022). Exploring the nursing factors related to ventilator-associated pneumonia in the intensive care unit. *Frontiers in Public Health, 10*, 715566. https://doi.org/10.3389/fpubh.2022.715566

Nurse Media
JOURNAL OF NURSING

e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):74-84, April 2024
https://doi.org/10.14710/nmjn.v14i1.62203

ORIGINAL RESEARCH

Patterns of Musculoskeletal Disorders among Staff Nurses in the Emergency Department in Saudi Arabia: A Cross-sectional Study

Afaf Mufadhi Alrimali[1] Nashi Masnad Alreshidi[1], Aljazi Albshri Alshammari[2], Aeedah Rfadah Alenzy[2], Riya Thomas[3], May Ann Dinoy[3], Fouz Aziz Alanzi[4], Eddieson Pasay-an[5]

[1]Nursing Executive Administration, Hail Health Cluster, Hail, Saudi Arabia
[2]Maternity and Children Hospital, Hail, Saudi Arabia
[3]Aja Long Term Care Hospital, Hail, Saudi Arabia
[4]King Khalid Hospital, Hail, Saudi Arabia
[5]College of Nursing, University of Hail, Saudi Arabia

Article Info

Article History:
Received: 19 February 2024
Revised: 29 March 2024
Accepted: 9 April 2024
Online: 30 April 2024

Keywords:
Emergency department; ergonomic; musculoskeletal disorders; nurses; Saudi Arabia

Corresponding Author:
Afaf Mufadhi Alrimali
Nursing Executive Administration, Hail Health Cluster, Hail, Saudi Arabia
Email: afafalrimali@gmail.com

Abstract

Background: The physically demanding and high-stress environment of Emergency Departments (EDs) significantly contributes to the heightened risk of musculoskeletal disorders (MSDs) among ED nurses. Despite this known association, there is a lack of comprehensive understanding of the prevalence rates and contributing factors within ED settings in Saudi Arabia, necessitating further investigation.
Purpose: This study delves into the prevalence and potential predictors of MSDs among nurses in this critical healthcare setting.
Methods: A cross-sectional survey was conducted in March 2023 using convenience sampling of 177 ED nurses across 16 public hospitals in Hail, Saudi Arabia. The Nordic Musculoskeletal Questionnaire was employed, with SPSS analyses covering frequency and percentage of pain prevalence via cross-tabulation, and logistic regression to identify risk factors.
Results: Over the past year, 68.9% of participants reported lower back pain affecting normal activities in 55.4% of cases. Neck pain was more likely in individuals aged 20-29 and former smokers accounting for 47.6% of the variance (p=0.001). Shorter shifts under 8 hours reduced neck pain risk, whereas a schedule with 50% of night shifts heightened the risk, contributing to 28.4% of the variance (p=0.001). Nurses aged 40-49 and those with significant childcare duties faced higher shoulder pain risk (p=0.024), and adult caregiving duties was linked to upper back pain explaining 40.6% of the variance (p=0.017). No significant links were found for other musculoskeletal pains.
Conclusion: The study reveals a significant prevalence of MSDs among the evaluated ED nurses, significantly influenced by specific demographic and work-related factors. Addressing these through ergonomic interventions, optimal scheduling, and wellness programs is crucial for nurse well-being and patient care. Future research should focus on creating holistic wellness programs that support nurses musculoskeletal health.

How to cite: Alrimali, A. M., Alreshidi, N. M., Alshammari, A. A., Alenzy, A. R., Thomas, R., Dinoy, M.A., Alanzi, F. A., & Pasay-an, E. (2024). Patterns of musculoskeletal disorders among staff nurses in the emergency department in Saudi Arabia: A cross-sectional study. *Nurse Media Journal of Nursing, 14*(1), 74-84. https://doi.org/10.14710/nmjn.v14i1.62203

1. Introduction

Work-related musculoskeletal disorders (MSDs) represent a critical and pervasive hazard in the modern workplace. Persistent exposure to occupational tasks can initiate a complex of symptoms affecting the musculoskeletal system, including pain, which can extend to muscles, bones, tendons, blood vessels, and nerves, leading to the development of MSDs (Centers for Disease Control and Prevention, 2020). These conditions are not just the leading cause of occupational morbidity, but are also a substantial contributor to missed workdays, suboptimal job performance, long-term disability, and a pronounced degradation in the quality of life (Wang et al., 2019). The fiscal impact of MSDs is substantial, encompassing extensive medical expenditures, workers' compensation, and a ripple effect through the economy due to lost productivity and increased healthcare utilization. These disorders are not merely individual health issues, emerging as a formidable public health challenge, straining the healthcare system, influencing the economy, and escalating societal costs (Crawford et al., 2020; Rosado et al., 2023).

Healthcare workers in particular often operate in constrained spaces or heavy loads maneuver, leading to an uptick in work-related MSDs (Jacquier-Bret & Gorce, 2023). This is particularly evident in high-intensity settings such as emergency departments (EDs), where nurses and other healthcare professionals engage in constant physically demanding activities, which can adversely affect their capacity to render high-quality care (Senmar et al., 2019). The reported prevalence of MSDs among nursing personnel is strikingly broad, with figures reaching over 80% (Chandralekha et al., 2022; Dhas et al., 2023; Krishnan et al., 2021; Nasaif et al., 2023; Ribeiro et al., 2017; Sun et al., 2023; Tang et al., 2022). This wide range emphasizes not only the pervasiveness of the issue but also the variability of the conditions within different healthcare settings and practices. The lower back, neck, and shoulder areas are most frequently impacted by these disorders (Aleid et al., 2021; Gilchrist & Pokorná, 2021; Nasaif et al., 2023; Rypicz et al., 2020; Senmar et al., 2019; Sun et al., 2023; Tang et al., 2022; Yunxia et al., 2022)

Previous literature has consistently linked a combination of intrinsic personal traits and extrinsic occupational demands to the heightened risk of MSDs in nurses (Alharbi et al., 2021; Chang & Peng, 2021; Lin et al., 2020; Muthukrishnan & Ahmad, 2021; Nurhayati et al., 2022; Zare et al., 2021). Personal traits such as age, body mass index, may predispose individuals to MSDs, affecting the body's resilience to physical stress (Krishnan et al., 2021; Lin et al., 2020). Occupational demands pose an additional risk through mechanisms such as biomechanical strain from prolonged awkward postures, musculoskeletal wear from the frequent handling of heavy objects, and tissue microtrauma resulting from repetitive task execution (Meyers et al., 2023). Vigorous exertion required in patient handling can overwhelm the musculoskeletal system's adaptive capacity (Muthukrishnan & Ahmad, 2021), while psychological job stressors, including the high-pressure environment, can lead to heightened muscle tension and impaired recovery (Afsharian et al., 2023; Zare et al., 2021). Irregular shift patterns and extended working hours limit the time available for restorative processes, compounding the impact on musculoskeletal health (Chang & Peng, 2021). This multifactorial framework, underlined by robust associations found in studies, situates MSDs as a consequential occupational hazard among nurses.

Within the nursing sector, evidence points to ED nurses as being particularly susceptible to MSDs, more so than their counterparts in other nursing areas (Ou et al., 2021). This vulnerability has profound implications for healthcare delivery: MSDs are a leading factor in both absenteeism and decreased productivity among nursing staff (Asuquo et al., 2021; Ribeiro et al., 2017), and have been implicated in a cascade of adverse effects, ranging from a degradation in the quality of patient care to diminished patient satisfaction and overall safety (Ribeiro et al., 2017). These interconnected outcomes encourages the urgent need for targeted interventions within the nursing profession, especially in high-risk ED settings.

Recent research points out the significance of targeted training and ergonomic strategies in diminishing MSDs among nurses (Abdollahi et al., 2020; Albanesi et al., 2022). Initiatives such as comprehensive training in patient handling and ergonomic tool usage directly address MSD risk factors. Equally, programs aimed at stress reduction (Zare et al., 2021) and promoting mindfulness are crucial for enhancing nurses' mental resilience, indirectly lowering MSD risks by encouraging healthier workplace habits and reducing stress-related musculoskeletal issues. These measures do not only equip nurses to effectively confront MSD challenges but also promote a culture of safety and well-being essential for high-quality patient care.

Although the impact of MSDs is recognized globally, there is a lack of comprehensive understanding of the prevalence rates and contributing factors within ED settings in Saudi Arabia, necessitating further investigation. Therefore, this study aims to address this gap by assessing the prevalence of MSD's patterns among ED staff nurses. Additionally, it explores and identifies the predictive factors that contribute to the incidence of MSDs within this cohort. The ultimate goal is to enhance awareness and support the introduction of preventive measures for MSDs in emergency departments across Saudi Arabia.

2. Methods

2.1 Research design

This research employed a cross-sectional epidemiological approach. It supports analyzing MSD prevalence and risk factors, ideal for our exploratory goals to identify predictors and form hypotheses for future research.

2.2 Setting and samples

The study was conducted in March 2023. Participants included ED nurses employed across all 16 peripheral and central public hospitals in the Hail region, Saudi Arabia. Eligible participants were those who had been working in the ED for at least one year and who expressed a willingness to participate in the study. To ensure a representative sample, we employed convenience sampling with a quota set for each hospital to reflect its proportion of the overall nurse population. The sample size for this study, targeting a population of 328 ED nurses within the region, was determined by presuming a 50% prevalence rate of MSDs. This rate was adopted based on a median value inferred from a range reported in existing literature on MSDs incidence among nurses, acknowledging the variability in such estimates (Chandralekha et al., 2022; Dhas et al., 2023; Krishnan et al., 2021; Nasaif et al., 2023; Ribeiro et al., 2017; Sun et al., 2023; Tang et al., 2022). A 95% confidence level and a 5% margin of error were chosen to ensure a representative and statistically significant sample, aligning with common practices for health-related research (Naing et al., 2022). These parameters culminated in a calculated sample size of 177. The study's response rate met this requirement precisely, with 177 received responses, thereby providing a robust data set for analysis.

2.3 Measurement and data collection

Survey data were collected in March 2023 using a Google Forms link containing the questionnaire. An informed consent form outlining the study's objectives, methods, potential risks, and the voluntary nature of participation, was included as part of the instrument. The researchers collaborated with the nursing offices in Hail region hospitals for the questionnaire distribution. They acted as intermediaries and were responsible for forwarding the questionnaire to the individual emails of ED nurses or posting it in professional groups on social media, depending on the most common and effective communication methods used within their respective hospitals.

This study's data collection instrument was divided into two sections. The initial segment encompassed 12 demographic inquiries designed to gather essential background information on each participant. Personal and occupational variables were incorporated, drawing on both the insights of pertinent epidemiological research on risk factors and the authors' expertise. These variables included gender, age, marital status, weekly hours dedicated to childcare, care for adults, smoking habits, years of experience in ED, typical shift length, the ratio of night shifts per month, weight, height, and Body Mass Index (BMI).

The second section of our survey used the English version of the Nordic Musculoskeletal Questionnaire (NMQ) (Kuorinka et al., 1987). The English version was utilized due to the participants' proficiency in English, and the presence of non-Arabic speaking staffs. The instrument delves into the prevalence and patterns of MSDs in the participant's key body regions including the neck, shoulders, upper back, elbows, wrists/hands, lower back, hips/thighs, knees, and ankles/feet. NMQ captures data on musculoskeletal pain through three inquiries. These include assessing the prevalence of musculoskeletal symptoms experienced over the past year, their occurrence within the last seven days, and their impact on the respondent's ability to undertake normal work activities over the last year. In our study, the section concerning the last seven days' prevalence was not utilized. This decision stemmed from a desire to emphasize the identification of long-standing musculoskeletal conditions and their underlying risk factors among ED nurses, rather than short-term or acute discomforts. This approach allows for a clearer understanding of the chronic musculoskeletal challenges faced by ED nurses, informing targeted interventions and preventative strategies tailored to mitigate occupational hazards and enhance the overall work environment and health outcomes for this critical workforce. The NMQ employs a simple binary scoring system where respondents indicate the presence or absence of pain or discomfort within the last year in each body region, along with their effect on daily tasks, which are noted in a binary yes/no format. Interpretation of the NMQ is primarily descriptive, focusing on the prevalence of reported symptoms. Scores are tallied based on the number of affected body areas, enabling targeted investigations into high-risk areas for MSDs among ED nurses.

The NMQ has been used to assess the severity and impact of musculoskeletal symptoms in occupational groups, including nursing populations. Reliability tests of the NMQ among clerical and nursing staff showed most items had disagreement rates between 0% and 15%, with some reaching 30%. Validity tests also revealed up to 13% disagreement. Following these findings, specific items were refined to improve the questionnaire's precision and utility (Kuorinka et al., 1987). The widespread use of the questionnaire in musculoskeletal disorder research across diverse populations underscores its effectiveness in capturing detailed and accurate data on MSDs. (López-Aragón et al., 2017). To ensure the NMQ's clarity and comprehensibility, it was pilot tested on a subset of the target population before the main study. The feedback confirmed participants' understanding, supporting its use in its English form.

2.4 Data analysis

All statistical analyses were performed using Statistical Package for the Social Sciences software, version 25 (IBM Inc., Chicago, IL, USA). The descriptive statistics for all the participants were expressed as frequency and percentage, which were calculated for the categorical variables. The prevalence of pain in each body region was determined by cross-tabulation. Logistic regression models were used to explore the risk factors among the participants, categorical variables were prepared for logistic regression analysis using dummy coding. There was no missing data in our analysis.

2.5 Ethical considerations

This research was approved by the Ethics Committee of Hail Region (Approval no 2023-8). Every participant was provided with a comprehensive explanation of the study's objectives, consent forms, details about their rights, including confidentiality and anonymity, and information on the anticipated time required to fill out the questionnaire. To ensure confidentiality and anonymity, no personal identifiers were collected, and participants were informed that any published results would be reported in aggregate form only, without any individual data being recognizable.

3. Results

3.1 Personal and work-related characteristics of the participants

Table 1 presents the personal and work-related characteristics of the participants. Of the 177 respondents included in this analysis, 133 (75.1%) were female, 106 (59.9%) were in the 20-to-29-year age group, and 90 (50.9%) were married. Most respondents reported that they spent zero hours per week caring for children (60.5%) and zero hours (41.8%) taking care of adults. Most of the respondents (92.7%) had never smoked and had been practicing in the ED for 1-5 years (46.9%). Almost half the respondents worked 8-to-12-hour shifts (49.7%). As per the proportion of night working shifts per month, the largest group (41.8%) worked 25% night shifts. The respondents had a mean weight of 66.7 kg (SD=16.8), a mean height of 162.3 cm (SD=8.7), and a mean body mass index (BMI) of 25.3 (SD=6.2) which ranged from 15.6 to 62.9.

Table 1. Personal and work-related characteristics (n=177)

Characteristics	f	%	Mean	SD
Age (year)				
20-29	106	59.9		
30-39	60	33.9		
40-49	9	5.1		
50 and above	2	1.1		
Gender				
Male	44	24.9		
Female	133	75.1		
Marital status				
Single	82	46.3		
Married	90	50.9		
Widowed/ separated	5	2.8		

Table 1. Continued

Characteristics	f	%	Mean	SD
Working experience in ED				
Less than a year	56	31.6		
1-5 years	83	46.9		
6-10 years	28	15.8		
10 years and above	10	5.7		
Working shift				
Less than 8-hour shift	82	46.3		
8-12 hour shift	88	49.7		
Over 12-hour shift	7	4.0		
Proportion of night shifts per month				
None	20	11.3		
25%	74	41.8		
50%	55	31.1		
75%	24	13.5		
Only night shifts	4	2.3		
Smoking status				
Never a smoker	164	92.7		
Were a former smoker	8	4.5		
Current smoker	5	2.8		
Hours spent per week caring for children				
Zero	107	60.5		
1-19	29	16.4		
20-49	28	15.8		
50	13	7.3		
Hours spent per week caring for adults				
Zero	74	41.8		
1-19	36	20.3		
20-49	44	24.9		
50	23	13		
Weight (kgs)			66.7	16.8
Height (cm)			162.3	8.7
BMI (kg/m2)			25.3	6.2

3.2 *Patterns of musculoskeletal disorders*

Table 2 illustrates any pain or discomfort experienced by the respondents over the last 12 months. Lower back pain was reported as the most frequent pain, affecting 68.9% of participants, followed by neck and shoulder pain (45.2% and 48.6% respondents respectively). Elbow pain was the least reported, with 83.1% of participants indicating no pain in this area.

Table 2. Pain experienced in the last 12 months (n=177)

Musculoskeletal pain	No f (%)	Yes f (%)
Neck	97 (54.8)	80(45.2)
Shoulders	91 (51.4)	86(48.6)
Elbows	147(83.1)	30 (16.9)
Upper back	110 (62.1)	67 (37.9)
Lower back	55 (31.1)	122 (68.9)
Wrists/hands	129 (72.9)	48(27.1)
One or both hips/thighs/buttocks	123(69.5)	54 (30.5)
One or both knees	109 (61.6)	68 (38.4)
One or both ankles/feet	117(66.1)	60 (33.9)

Table 3 shows any musculoskeletal pain that prevented the respondents from conducting normal activities. Lower back pain significantly hindered normal activities for 55.4% of the participants, the highest among the body parts listed. In contrast, elbow pain was the least disruptive, with 80.2% reporting no interference with activities.

Table 3. Musculoskeletal pain preventing normal activity (n=177)

Musculoskeletal pain	No f(%)	Yes f (%)
Neck	124 (70.1)	53 (29.9)
Shoulders both/either	120 (67.7)	57 (32.2)
Elbows both/either	142 (80.2)	35 (19.8)
Wrists/hands both/either	132 (74.6)	45 (25.4)
Upper back	121 (68.4)	56 (31.6)
Lower back	79 (44.6)	98 (55.4)
Hips/thighs/buttocks	124 (70.1)	53 (29.9)
Knees	121 (68.4)	56 (31.6)
Ankles/feet	126 (71.2)	51 (28.8)

3.3 *Predictive factors contributing to the incidents of musculoskeletal disorders*

Table 4 presents the binomial logistic regression used to ascertain the effects of personal and work-related characteristics of the participants on musculoskeletal pain interfering with normal activities. The logistic regression models for neck pain, shoulder pain, and upper back pain were statistically significant. On the other hand, the binomial logistic regressions concerning elbows, wrists/hands, the lower back, hips/thighs/buttocks, knees, and ankles/feet were not statistically significant ($p>0.05$).

A logistic regression model was statistically significant for neck pain, $\chi^2=69.879$, $p=0.001$. The model explained 47.6% (Nagelkerke R^2) of the variance in debilitating neck pain. Of all the predictor variables, only four were statistically significant: the 20- to 29-year-old age group, former smokers, working shifts lasting less than 8 hours, and working 50% night shifts. Those in the 20- to 29-year-old age group had 4.18 times higher odds of experiencing neck pain interfering with daily activities compared to other age groups, while former smokers had 19.932 increased odds. Individuals normally working shifts lasting less than 8 hours had 0.31 decreased odds of having neck pain. Those working 50% night shifts had 12.448 increased odds of experiencing neck pain interfering with normal activities.

Another logistic regression model was statistically significant, explaining 28.4% (Nagelkerke R^2) of the variance in debilitating shoulder pain, $\chi^2=57.154$, $p=0.024$. Of all the predictor variables, only three were statistically significant: the 40- to 49-year-old age group, spending more than 50 hours per week taking care of children, and normally working shifts lasting less than 8 hours. Those who were 40 to 49 years old had 128.841 increased odds of having debilitating shoulder pain compared to other age groups, while those spending more than 50 hours a week caring for children had 12.066 increased odds. Individuals typically working shifts lasting less than 8 hours had 0.325 decreased odds of shoulder pain interfering with normal activities. Another logistic regression model was statistically significant, explaining 40.6% (Nagelkerke R^2) of the variance in debilitating upper back pain, $\chi^2=58.649$, $p=0.017$. Of all the predictor variables, only two were statistically significant: those caring for adults for 20 to 49 hours per week, and over 50 hours per week. Those caring for adults for 20 to 49 hours and over 50 hours per week had 9.229 and 15.239 increased odds, respectively.

4. Discussion

This study examined the patterns and predictors of MSDs among staff nurses in the ED. Reports from ED nurses revealed that MSDs commonly affected various body regions, hindering their daily functions and effectiveness at work. Lower back, neck, and shoulder pain emerged as the most common areas of discomfort among ED nurses; a finding that is consistent with previous research (Aleid et al., 2021; Gilchrist & Pokorná, 2021; Nasaif et al., 2023; Rypicz et al., 2020; Senmar et al., 2019; Sun et al., 2023; Tang et al., 2022; Yunxia et al., 2022). Our findings align with global observations, suggesting that such discomfort transcends geographical and cultural boundaries and is closely linked to the intrinsic nature of nursing tasks. The rigorous demands of patient care, which often involve lifting, transferring, and supporting patients, can lead to cumulative strain on the musculoskeletal system, particularly in the spine and shoulders (Richardson et al., 2019). The pronounced prevalence of lower back pain among our study's ED nurses, with a notable 68.9% affected, demands a significant occupational health concern, which echoes the broader literature's identification of lumbar issues as a primary challenge within the nursing profession (López-Aragón et al., 2017). The disruption of regular activities reported by 55.4% of participants draws attention not only to individual well-being but also to potential implications for workforce sustainability and patient care quality. These persisting findings suggest a systemic issue within nursing work environments and highlight the imperative need for effective ergonomic solutions.

Table 4. Logistic regression predicting pain interfering with normal activities

Predictors	B	SE.	Wald	X^2	R^2	*p*	OR	95%CI
Neck pain predictors				69.879	47.6%	0.001		
20-29 years old	1.429	0.634	5.082			0.024	4.175	1.205-14.462
Less than 8-hour shift	-1.186	0.563	4.443			0.035	0.305	0.101-0.920
Former smoker	1.034	0.294	11.490			0.022	0.294	
50% night shift/month	2.522	1.028	6.018			0.014	12.448	1.660-93.337
Constant	22.855	31.415	0.529			0.467	8426517656.459	
Shoulder pain predictors				57.154	28.4%	0.024		
40-49 years old	4.859	1.913	6.448			0.011	128.841	3.029-5479.745
50 hours per week caring for children	2.490	0.994	6.282			0.012	12.066	1.721-84.598
Less than 8-hour shift	-1.123	0.523	4.610			0.032	0.325	0.117-0.907
Constant	22.710	28.046	0.656			0.418	7288873815.027	
Upper back pain predictors				58.649	40.6%	0.017		
20-49 hours taking care of adults	2.222	0.680	10.674			0.001	9.229	2.433-35.007
Over 50 hours taking care of adults	2.724	0.796	11.720			0.001	15.239	3.204-72.476
Constant	26.357	23.754	1.231			0.267	279665446281.096	

Note. B=Regression Coefficient, SE=Standard Error, Wald=Wald Statistic, X2=Chi-square Statistic, R2=Pseudo R-squared (Nagelkerke)

In our study, younger nurses (aged 20-29) were found to be at a markedly higher risk for functional neck pain, with a risk of 4.18 times greater than other age groups. This finding might reflect the unique combination of lifestyle factors—such as intensive use of technology—and job-related pressures characteristic of this age group. This is supported by Chan et al. (2020) who linked smartphone overuse to neck pain in nursing students. Additionally, our data suggested that lifestyle choices, such as smoking, have a lingering impact on musculoskeletal health, even after cessation. Former smokers in our cohort faced an alarming 19.932-fold increased risk of neck pain, resonating with Chen et al. (2018)'s findings on the long-term effects of smoking on neck pain incidence. Notably, working less than 8 hours emerged as a protective factor, which might reflect the benefits of shorter work periods in reducing cumulative physical strain, as suggested by the inverse relationship between work hours and the prevalence of MSDs (López-Aragón et al., 2017). This could potentially inform shift scheduling policies aimed at minimizing musculoskeletal strain among ED nurses. Moreover, our findings highlighted the negative impact of night shifts on musculoskeletal health, with a staggering 12.448-fold increase in the risk of neck pain. Night shifts often involve a higher workload and increased frustration levels, which Bazazan et al. (2019) have associated with worsened musculoskeletal outcomes. Collectively, these findings pointed to a multifactorial etiology for neck pain among ED nurses, necessitating a multifaceted approach to prevention and management. Such modifications could encloud scheduling practices, lifestyle modification programs, and ergonomic interventions.

The study findings highlighted a pronounced increase in the risk of musculoskeletal pain with age, particularly within the 40-49 age group, which showed a 128.841-fold rise in debilitating shoulder pain. Supporting evidence revealed a 2.4% annual incidence rate of shoulder pain in adults over 40 (Djade et al., 2020). This significant uptick may be rationalized by age-related degenerative processes, reduced muscle strength, and the cumulative effect of prolonged exposure to occupational risk factors (Nygaard et al., 2022). This insight suggests a dual burden of natural aging processes and occupational exposures contributing to the heightened risk of musculoskeletal conditions. Furthermore, the significant association between extensive caregiving hours and the increased likelihood of shoulder and upper back pain among nurses sheds light on the compounded effects of work and non-work-related physical activities. The parallel between caregiving duties and clinical tasks—both involving strenuous physical efforts such as lifting and bending—suggests an overlapping risk factor that may limit opportunities for muscle recovery and exacerbate the risk of injury (Tariah et al., 2020). This scenario indicates the critical need for comprehensive occupational health strategies that consider the full scope of physical exertion experienced by nurses, both in their professional and personal lives. To address these challenges, targeted intervention strategies should not only focus on ergonomic improvements within the clinical setting but also advocate for supportive measures that extend into the home environment.

5. Implication and limitation

The study calls for healthcare systems to recognize the surge in MSDs among ED nurses, as these conditions significantly affect their work performance and raise the risk of work-related disability. A comprehensive strategy is crucial, beginning with early ergonomic interventions. This includes ergonomic assessments of workstations and providing ergonomic equipment such as adjustable chairs, ergonomic keyboards, and specialized footwear. Workspace modifications, like arranging equipment for easy reach and optimizing lighting, are also essential. Training programs on proper lifting techniques, promoting regular physical activity, and stress management initiatives are integral components. Wellness programs must be customized to tackle specific risk factors such as age, smoking status, shift patterns, and night duties. This includes regular musculoskeletal evaluations for nurses across all career stages, ensuring access to physical therapy, and revising work schedules to alleviate the strain from extensive night shifts. The study also indicates that personal caregiving responsibilities might exacerbate shoulder and upper back pain, pointing to the necessity for healthcare institutions to provide flexible schedules and additional support to nurses who have dual caregiving roles. Moreover, fostering a culture that encourages reporting and addressing early signs of musculoskeletal discomfort can aid in timely intervention, potentially mitigating the progression of symptoms.

The study's limitations arise from its cross-sectional design, which precludes establishing causal relationships between identified factors and MSDs. Additionally, its regional focus on the Hail region may impact the generalizability of the findings. Furthermore, the reliance on self-reported data can introduce bias, while the snapshot nature of the study may not have fully captured the fluctuating prevalence of MSDs over time or the influence of unmeasured confounding variables.

6. Conclusion

The results of this study serve as foundational data for the Hail region, setting the stage for heightened awareness and the adoption of preventative measures against MSDs among ED nurses. The research finds a significant incidence of MSDs, with demographic and work-related factors substantially influencing this trend. A majority of participants experienced lower back pain, which often impacted their daily activities. Neck pain was more prevalent among younger adults and former smokers, with night shifts also increasing the risk. Shoulder pain was notably higher in middle-aged nurses and those with childcare responsibilities, while upper back pain was associated with adult caregiving duties. Addressing these issues is crucial and calls for the implementation of ergonomic improvements, the establishment of appropriate work schedules, and the initiation of wellness programs—all of which are vital to the well-being of nurses and the standard of patient care. Our findings highlight the need for continuous study and follow-up on MSD interventions among ED nurses. Future research should focus on creating holistic wellness programs that support musculoskeletal health, aiming to foster a work environment that enhance nurses' well-being.

Acknowledgment

We sincerely thank all participants for their invaluable contributions to this study.

Author contribution

All authors (AMA, NMA, AAA, ARA, RT, MAD, FAA, EPA) contributed substantially to the study design, data collection, analysis, and interpretation of results. All authors drafted and revised the article and approved the published version.

Conflict of interest

The authors declare that there is no conflict of interest regarding the research, authorship, or publication of this manuscript.

References

Abdollahi, T., Razi, S. P., Pahlevan, D., Yekaninejad, M. S., Amaniyan, S., Sieloff, C. L., & Vaismoradi, M. (2020). Effect of an ergonomics educational program on musculoskeletal disorders in nursing staff working in the operating room: A quasi-randomized controlled clinical trial. *International Journal of Environmental Research and Public Health*, *17*(19), 7333. https://doi.org/10.3390/IJERPH17197333

Afsharian, A., Dollard, M. F., Glozier, N., Morris, R. W., Bailey, T. S., Nguyen, H., & Crispin, C. (2023). Work-related psychosocial and physical paths to future musculoskeletal disorders (MSDs). *Safety Science*, *164*, 106177. https://doi.org/10.1016/J.SSCI.2023.106177

Albanesi, B., Piredda, M., Bravi, M., Bressi, F., Gualandi, R., Marchetti, A., Facchinetti, G., Ianni, A., Cordella, F., Zollo, L., & De Marinis, M. G. (2022). Interventions to prevent and reduce work-related musculoskeletal injuries and pain among healthcare professionals: A comprehensive systematic review of the literature. *Journal of Safety Research*, *82*, 124–143. https://doi.org/10.1016/J.JSR.2022.05.004

Aleid, A. A., Eid Elshnawie, H. A., & Ammar, A. (2021). Assessing the work activities related to musculoskeletal disorder among critical care nurses. *Critical Care Research and Practice, 2021, 8896806*. https://doi.org/10.1155/2021/8896806

Alharbi, S. M., Alghanem, A. K., Alessa, H. A., Aldoobi, R. S., Busayli, F. A., Alharbi, K. S., Alzahrani, A. S., Kashkari, K. A., Huraib, M. M., Harbi, S. S. A., & Higazy, Y. E. (2021). Most common ergonomic injuries among healthcare workers. *International Journal of Community Medicine and Public Health*, 8(11), 5494–5498. https://doi.org/10.18203/2394-6040.ijcmph20214086

Asuquo, E. G., Tighe, S. M., & Bradshaw, C. (2021). Interventions to reduce work-related musculoskeletal disorders among healthcare staff in nursing homes; An integrative literature review. *International Journal of Nursing Studies Advances*, *3*, 100033. https://doi.org/10.1016/J.IJNSA.2021.100033

Bazazan, A., Dianat, I., Bahrampour, S., Talebian, A., Zandi, H., Sharafkhaneh, A., & Maleki-Ghahfarokhi, A. (2019). Association of musculoskeletal disorders and workload with work schedule and job satisfaction among emergency nurses. *International Emergency Nursing*, *44*, 8–13. https://doi.org/10.1016/J.IENJ.2019.02.004

Centers for Disease Control and Prevention. (2020). *Work-related musculoskeletal disorders & ergonomics-Workplace health strategies by condition-Workplace health promotion*. CDC. https://www.cdc.gov/workplacehealthpromotion/health-strategies/musculoskeletal-disorders/index.html

Chan, L. L. Y., Wong, A. Y. L., Wang, M. H., Cheung, K., & Samartzis, D. (2020). The prevalence of neck pain and associated risk factors among undergraduate students: A large-scale cross-sectional study. *International Journal of Industrial Ergonomics*, *76*, 102934. https://doi.org/10.1016/J.ERGON.2020.102934

Chandralekha, K., Joseph, M., & Joseph, B. (2022). Work-related musculoskeletal disorders and quality of life among staff nurses in a tertiary care hospital of Bangalore. *Indian Journal of Occupational and Environmental Medicine*, *26*(3), 178. https://doi.org/10.4103/IJOEM.IJOEM_25_22

Chang, W. P., & Peng, Y. X. (2021). Differences between fixed day shift nurses and rotating and irregular shift nurses in work-related musculoskeletal disorders: A literature review and meta-analysis. *Journal of Occupational Health*, *63*(1), 12208. https://doi.org/10.1002/1348-9585.12208/7249827

Chen, Z., Li, X., Pan, F., Wu, D., & Li, H. (2018). A retrospective study: Does cigarette smoking induce cervical disc degeneration? *International Journal of Surgery (London, England)*, *53*, 269–273. https://doi.org/10.1016/J.IJSU.2018.04.004

Crawford, J. O., Berkovic, D., Erwin, J., Copsey, S. M., Davis, A., Giagloglou, E., Yazdani, A., Hartvigsen, J., Graveling, R., & Woolf, A. (2020). Musculoskeletal health in the workplace. *Best Practice & Research Clinical Rheumatology*, *34*(5), 101558. https://doi.org/10.1016/J.BERH.2020.101558

Dhas, B. N., Joseph, L., Jose, J. A., Zeeser, J. M., Devaraj, J. P., & Chockalingam, M. (2023). Prevalence of work-related musculoskeletal disorders among pediatric long-term ventilatory care unit nurses: Descriptive cross-sectional study. *Journal of Pediatric Nursing*, *69*, e114–e119. https://doi.org/10.1016/j.pedn.2022.12.015

Djade, C. D., Porgo, T. V., Zomahoun, H. T. V., Perrault-Sullivan, G., & Dionne, C. E. (2020). Incidence of shoulder pain in 40 years old and over and associated factors: A systematic review. *European Journal of Pain*, *24*(1), 39–50. https://doi.org/10.1002/EJP.1482

Asuquo, E. G., Tighe, S. M., & Bradshaw, C. (2021). Interventions to reduce work-related musculoskeletal disorders among healthcare staff in nursing homes; An integrative literature review. *International Journal of Nursing Studies Advances*, *3*, 100033. https://doi.org/10.1016/J.IJNSA.2021.100033

Gilchrist, A., & Pokorná, A. (2021). Prevalence of musculoskeletal low back pain among registered nurses: Results of an online survey. *Journal of Clinical Nursing*, *30*(11–12), 1675–1683. https://doi.org/10.1111/JOCN.15722

Jacquier-Bret, J., & Gorce, P. (2023). Prevalence of body area work-related musculoskeletal disorders among healthcare professionals: A systematic review. *International Journal of Environmental Research and Public Health*, *20*(1), 841. https://doi.org/10.3390/IJERPH20010841

Krishnan, K. S., Raju, G., & Shawkataly, O. (2021). Prevalence of work-related musculoskeletal disorders: Psychological and physical risk factors. *International Journal of Environmental Research and Public Health*, *18*(17), 9361. https://doi.org/10.3390/IJERPH18179361

Kuorinka, I., Jonsson, B., Kilbom, A., Vinterberg, H., Biering-Sørensen, F., Andersson, G., & Jørgensen, K. (1987). Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. *Applied Ergonomics*, *18*(3), 233–237. https://doi.org/10.1016/0003-6870(87)90010-X

Lin, S. C., Lin, L. L., Liu, C. J., Fang, C. K., & Lin, M. H. (2020). Exploring the factors affecting musculoskeletal disorders risk among hospital nurses. *PloS One*, *15*(4). https://doi.org/10.1371/JOURNAL.PONE.0231319

López-Aragón, L., López-Liria, R., Callejón-Ferre, ángel J., & Gómez-Galán, M. (2017). Applications of the standardized nordic questionnaire: A review. *Sustainability*, *9*(9), 1514. https://doi.org/10.3390/SU9091514

Meyers, A. R., Wurzelbacher, S. J., Krieg, E. F., Ramsey, J. G., Crombie, K., Christianson, A. L., Luo, L., & Burt, S. (2023). Work-related risk factors for rotator cuff syndrome in a prospective study of manufacturing and healthcare workers. *Human Factors*, *65*(3), 419–434. https://doi.org/10.1177/00187208211022122

Muthukrishnan, R., & Ahmad, J. M. (2021). Ergonomic risk factors and risk exposure level of nursing tasks: association with work-related musculoskeletal disorders in nurses. *European Journal of Physiotherapy*, *23*(4), 248–253. https://doi.org/10.1080/21679169.2020.1715473

Naing, L., Nordin, R. Bin, Abdul Rahman, H., & Naing, Y. T. (2022). Sample size calculation for prevalence studies using Scalex and ScalaR calculators. *BMC Medical Research Methodology*, *22*(1), 209. https://doi.org/10.1186/S12874-022-01694-7/FIGURES/4

Nasaif, H., Alaradi, M., Hammam, R., Bucheeri, M., Abdulla, M., & Abdulla, H. (2023). Prevalence of self-reported musculoskeletal symptoms among nurses: A multicenter cross-sectional study in Bahrain. *International Journal of Occupational Safety and Ergonomics*, *29*(1), 192–198. https://doi.org/10.1080/10803548.2021.2025315

Nurhayati, I., Widiyanto, A., Putri, S. I., Atmojo, J. T., Fajriah, A. S., & Hidayat, A. R. (2022). Risk factor of work-related musculoskeletal disorders among nurses: A meta-analysis. *Bulletin of National Institute of Health Sciences*, *140*(01), 1343–4292. https://shorturl.at/hjBW1

Nygaard, N. P. B., Thomsen, G. F., Rasmussen, J., Skadhauge, L. R., & Gram, B. (2022). Ergonomic and individual risk factors for musculoskeletal pain in the ageing workforce. *BMC Public Health*, *22*(1), 1–12. https://doi.org/10.1186/S12889-022-14386-0/FIGURES/3

Ou, Y. K., Liu, Y., Chang, Y. P., & Lee, B. O. (2021). Relationship between musculoskeletal disorders and work performance of nursing staff: A comparison of hospital nursing departments. *International Journal of Environmental Research and Public Health*, *18*(13), 7085. https://doi.org/10.3390/IJERPH18137085

Ribeiro, T., Serranheira, F., & Loureiro, H. (2017). Work related musculoskeletal disorders in primary health care nurses. *Applied Nursing Research*, *33*, 72–77. https://doi.org/10.1016/J.APNR.2016.09.003

Richardson, A., Gurung, G., Derrett, S., & Harcombe, H. (2019). Perspectives on preventing musculoskeletal injuries in nurses: A qualitative study. *Nursing Open*, *6*(3), 915. https://doi.org/10.1002/NOP2.272

Rosado, A. S., Baptista, J. S., Guilherme, M. N. H., & Guedes, J. C. (2023). Economic impact of work-related musculoskeletal disorders—A systematic review. *Studies in Systems, Decision and Control*, *449*, 599–613. https://doi.org/10.1007/978-3-031-12547-8_48/COVER

Rypicz, Ł., Karniej, P., Witczak, I., & Kołcz, A. (2020). Evaluation of the occurrence of work-related musculoskeletal pain among anesthesiology, intensive care, and surgical nurses: An observational and descriptive study. *Nursing & Health Sciences*, *22*(4), 1056–1064. https://doi.org/10.1111/NHS.12767

Senmar, M., Pour, F. Z., Soleimani, P., Yamini, M., & Rafiei, H. (2019). The prevalence of musculoskeletal disorders among nurses working in emergency department. *Journal of Preventive Epidemiology*, *4*(2), e12–e12. https://www.academia.edu/71907751/The_prevalence_of_musculoskeletal_disorders_among_nurses_working_in_emergency_department

Sun, W., Yin, L., Zhang, T., Zhang, H., Zhang, R., & Cai, W. (2023). Prevalence of work-related musculoskeletal disorders among nurses: A meta-analysis. *Iranian Journal of Public Health*, *52*(3), 463. https://doi.org/10.18502/IJPH.V52I3.12130

Tang, L., Wang, G., Zhang, W., & Zhou, J. (2022). The prevalence of MSDs and the associated risk factors in nurses of China. *International Journal of Industrial Ergonomics*, *87*, 103239. https://doi.org/10.1016/J.ERGON.2021.103239

Tariah, H. A., Nafai, S., Alajmi, M., Almutairi, F., & Alanazi, B. (2020). Work-related musculoskeletal disorders in nurses working in the Kingdom of Saudi Arabia. *Work*, *65*(2), 421–428. https://doi.org/10.3233/WOR-203094

Wang, T., Zhao, Y. L., Hao, L. X., & Jia, J. G. (2019). Prevalence of musculoskeletal symptoms among industrial employees in a modern industrial region in Beijing, China. *Chinese Medical Journal*, *132*(7), 789–797. https://doi.org/10.1097/CM9.0000000000000165

Yunxia, L., Renhe, Y., Qi, L., Lu, F., Xiantao, H., Chong, C., Yaohong, L., Su'e, Y. (2022). Prevalence and workload-related risk factors of neck-shoulder pain among nurses in Hunan tertiary general hospitals. *Journal of Environmental and Occupational Medicine*, *39*(6), 695–700. https://doi.org/10.11836/JEOM21342

Zare, A., Choobineh, A., Hassanipour, S., & Malakoutikhah, M. (2021). Investigation of psychosocial factors on upper limb musculoskeletal disorders and the prevalence of its musculoskeletal disorders among nurses: A systematic review and meta-analysis. *International Archives of Occupational and Environmental Health*, *94*(5), 1113–1136. https://doi.org/10.1007/S00420-021-01654-6/METRICS

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):85-95, April 2024
https://doi.org/10.14710/nmjn.v14i1.56949

ORIGINAL RESEARCH

The Expectations Regarding Aging and Ageism Perspective between Nurses and Caregivers in Long-term Care Facilities

Dianis Wulan Sari[1,2,3], Elida Ulfiana[1,2], Nourmayansa Vidya Anggraini[4], Niko Dima Kristianingrum[5], Gading Ekapuja Aurizki[1,6], Maiko Noguchi-Watanabe[7]

[1]*Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia*
[2]*Dementia and Aging Care Research Center, Universitas Airlangga, Surabaya, Indonesia*
[3]*Gerontological Home Care and Long-term Care Nursing, The University of Tokyo, Japan*
[4]*School of Nursing, Faculty of Health Science, Universitas Pembangunan Nasional Veteran Jakarta, Indonesia*
[5]*School of Nursing, Faculty of Health Science, Universitas Brawijaya, Malang, Indonesia*
[6]*Division of Nursing, Midwifery and Social Work, School of Health Sciences, The University of Manchester, Manchester, United Kingdom*
[7]*Department of Home Care Nursing Science, School of Health Care Sciences, Tokyo Medical and Dental University, Japan*

Article Info

Article History:
Received: 1 August 2023
Revised: 18 April 2024
Accepted: 19 April 2024
Online: 30 April 2024

Keywords:
Ageism; COVID-19; healthcare services; healthcare workers; long-term care

Corresponding Author:
Dianis Wulan Sari
Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia
Email:
dianis.wulan.sari@fkp.unair.ac.id

Abstract

Background: Ageism negatively impacts older adults' health, especially in long-term care facilities (LTCFs), where healthcare workers often hold unfavorable views of them. Understanding these perspectives is vital for combating ageism and improving LTCF quality. Yet, comprehensive studies on healthcare workers' attitudes toward ageism are lacking, hindering targeted interventions. Therefore, grasping their attitudes and behaviors is crucial for addressing ageism in LTCFs and enhancing care for older adults.

Purpose: This study aimed to explore healthcare workers' expectations regarding aging and their perspective on ageism towards older adults in LTCFs.

Methods: This study was randomly conducted in sixteen LTCFs across Indonesia's five largest islands using a cross-sectional study with a comparative descriptive design. Participants included 56 nurses and 173 non-licensed caregivers. Data on aging expectations and ageism perspectives during the COVID-19 pandemic were collected. An online and offline self-administered questionnaires (i.e., participant's characteristics, the expectations regarding aging survey, ageism perspective in time of the COVID-19 pandemic) were conducted. Differences between nurses and caregivers were analyzed using chi-square and independent t-tests.

Results: Altogether, 56 nurses and 173 caregivers (with an average age of 39.9 years) participated in the study. Significant differences were observed between nurses and non-licensed caregivers in their expectations regarding physical health, mental health, and overall expectations regarding aging (p-value = <0.001, <0.001, <0.001, respectively). Non-licensed caregivers had higher mean scores for each item compared to nurses. Whereas, the perspective nurse and non-licensed caregivers were significantly different about older adults being more accessible to being infected with SARS-CoV-2, vulnerable population, prone to severity, easier to expose virus, low income, must isolated (p-value = 0.029, 0.007, 0.010, 0.033, <0.001, <0.001, respectively). The mean score of each item of nurses was higher than non-licensed caregivers.

Conclusion: The expectation regarding aging of caregivers was higher than nurses. In line, the nurses' scores have a lower attitude toward ageism during time COVID-19 pandemic. Exposure to ageism behavior and ageing conditions needs to be done for healthcare workers.

How to cite: Sari, D. W., Ulfiana, E., Anggraini, N. V., Kristianingrum, N. D., Aurizki, G. E., & Noguchi-Watanabe, M. (2024). The expectations regarding aging and ageism perspective between nurses and caregivers in long-term care facilities. *Nurse Media Journal of Nursing, 14*(1), 85-95. https://doi.org/10.14710/nmjn.v14i1.56949

1. Introduction

Long-term care facilities (LTCFs) serve as vital support systems for older adults with diminished functional capacities, requiring extended care for their daily activities (Gaugler, 2014;

Lehnert et al., 2019). In these settings, healthcare professionals, notably nurses and caregivers, closely engage with older individuals, significantly contributing to their well-being (Eom et al., 2017). However, the pervasive presence of ageism, marked by discrimination, prejudice, and stereotyping based on age, poses a threat to the quality of care provided to older adults (Voss et al., 2018).

Numerous research studies have consistently documented instances of ageism within LTCFs (Herdman, 2002; Loy-Ashe et al., 2024; São José & Amado, 2017). These findings reveal patterns of negative stereotypes, differential treatment, and discriminatory attitudes towards older adults (Nelson, 2005; São José & Amado, 2017). Previous studies have highlighted the impact of ageism on the interactions and attitudes of employees in LTCFs towards older adults (Ben-Harush et al., 2017; Loy-Ashe et al., 2024). Ageism among healthcare workers affects the quality of treatment and the services that older adults receive (Courtney et al., 2000; Robb et al., 2002). Moreover, evidence suggests that ageism extends beyond professional boundaries, affecting various healthcare providers, including physicians, nurses, and social workers (Ben-Harush et al., 2017). Therefore, investigating ageism among healthcare workers is crucial to ensuring that older adults receive fair and impartial.

Understanding the expectations and attitudes of healthcare workers regarding aging is also imperative for effectively addressing ageism within LTCFs. Nurses and caregivers, as frontline caregivers, hold distinct perspectives that shape their interactions with older individuals (Kagan & Melendez-Torres, 2015; Nelson, 2005; Rhee et al., 2019). Exploring these expectations and examining the prevalence and manifestations of ageism among healthcare professionals offer valuable insights into the dynamics of ageism within LTCFs (Ben-Harush et al., 2017).

Furthermore, expectations regarding the aging of healthcare workers can significantly impact their interactions with older generations in care settings. Negative expectations of older adults persist within the healthcare community across various professional disciplines and care environments (Ayalon, 2018). Healthcare workers' expectations of older adults play a crucial role in shaping the quality of care provided (Kagan, 2020; Kagan & Melendez-Torres, 2015). In this study, expectations regarding aging refer to specific criteria or parameters used to measure individuals' beliefs, attitudes, or anticipations about the aging process and its outcomes (Breda & Watts, 2017). Additionally, the COVID-19 pandemic has exacerbated existing challenges, including ageism, across different contexts (Ayalon et al., 2021; Kagan, 2020; Silva et al., 2021). Ageism, rooted in age-based categorization and divisions, perpetuates harm, disadvantage, and injustice, undermining intergenerational solidarity (Kessler & Bowen, 2020; World Health Organization, 2021). The increasing age is invariably linked with higher death prevalence during the COVID-19 pandemic. Although evidence for the direct relationship between age and health outcomes of COVID-19 is correlational (Yanez et al., 2020), it potentially adds to the complexity of attitudes toward older adults' group (Swift & Chasteen, 2021).

In this study, ageism perspective refers to the specific criteria or parameters used to evaluate individuals' attitudes, beliefs, and behaviors towards older adults (Marques et al., 2020). The pandemic's impact on healthcare professionals' perceptions of older adults is particularly noteworthy, given that ageism transcends professional boundaries (Courtney & Walsh, 2000; Shaw et al., 2022). Hence, examining healthcare professionals' perspectives on older adults during the COVID-19 pandemic is crucial for understanding the nuances of ageism in this context.

This research holds significant implications for enhancing the quality of care provided to older adults in LTCFs. By deepening our understanding of healthcare professionals' expectations and attitudes toward aging, healthcare workers can take steps to address ageism, foster age-friendly care environments, and bolster the well-being and dignity of older individuals receiving care in these settings (São José & Amado, 2017; São José et al., 2019). However, comprehensive studies on healthcare workers' perspectives regarding ageism are lacking (Loy-Ashe et al., 2024), hindering the development of targeted interventions. Understanding their attitudes and behaviors is essential for effectively addressing ageism in LTCFs and enhancing the care quality for older adults. This study aims to shed light on aging and ageism expectations among nurses and caregivers in LTCFs. By investigating their ageism perspectives, the study seeks to identify the prevalence and manifestations of ageism within these professional groups and assess its potential impact on the care provided to older adults. Additionally, the study explores nurses and caregivers' perceptions of older adults during the COVID-19 pandemic, providing insights into ageism during this challenging period.

2. Methods

2.1. Research design

This study employed a cross-sectional design with a comparative descriptive approach, utilizing self-administered questionnaires to gather data from participants. The comparative descriptive design allowed for the examination of differences and similarities across various factors of interest, providing valuable insights into the study variables within the sampled population.

2.2. Setting and samples

This study was conducted on LTCFs in Indonesia from five biggest islands (Sumatera, Java, Borneo, Sulawesi, Bali). These islands have diverse cultures, which may lead to variations in participant characteristics, thereby representing Indonesian cultural diversity. The inclusion criteria for LTCFs were that they had been established before November 2019 and employed at least one nurse. The COVID-19 pandemic influenced the ageism experience. We included the LTCFs and staff who were established and worked before the COVID-19 pandemic, so it would enhance the similar experience before and after the pandemic. About the LTCFs, we randomized 20 LTCFs in a computer-based random number generator. Research team applied approval for data collection from the Indonesian government. Sixteen LTCFs approved to participate in this study. The principal investigator explained and applied for approval from the principal authorities of LTCFs.

The staff of LTCFs participating in this study were healthcare workers (nurses and non-licensed caregivers) who worked before the COVID-19 pandemic. In this study, non-licensed caregivers refer to individuals who work for older adults with remunerate but they do not have a formal caregiver licence. Currently, Indonesia does not have a formal caregiver licence for healthcare purposes. Meanwhile, nurses are licensed healthcare workers with formal education. Nurse for this study are remunerated workers. We used total sample for the sample size. The sample size was also calculated using a power analysis (Hunt, 2012). The minimum sample size is 108 (nurses and caregivers) with an effect size of $d = 0.5$ (Ref. study: $d = 0.5$, $\alpha = 0.05$, power = 0.80).

2.3. Measurement and data collection

The data collection for this study took place between March and November 2021. Both online and offline methods were utilized, with online surveys being the primary approach. Upon obtaining approval from LTCF facilities, we sent a cover letter explaining the study purpose and providing assurance regarding the voluntary and confidential nature of their responses. The URL and paper copies of the questionnaire were sent to the principal authorities of the LTCFs. The LTCFs were given the option to choose between online and offline questionnaire formats. Self-administered questionnaires were then distributed to the LTCFs, accompanied by the research explanations and informed consent information, both online and offline. For the offline method, the authors collected the study results from the principal authorities or designated individuals at the LTCFs. These authorities then disseminated the information to the nurses and caregivers within the LTCFs.

The online survey was created using a paid Google Forms account to ensure the security of the data. This method of using Google Forms made it convenient for participants as they did not require an account to access, complete, or submit the questionnaire. Basic computer and phone literacy were sufficient for accessing, filling, and submitting the form. To prevent participants from getting lost on a lengthy page, the questions were divided into ten sequential screens with a progress indicator. The Google Form was structured into five sections. Participants could click directly on the first section, which provided information about the purpose of the study, the research team, research ethics considerations, questionnaire contents, estimated completion time, and a statement of consent. The second section focused on gathering information about the participants' characteristics. The details of the questionnaire were explained in the subsequent section. Notably, all questions were optional, and participants had the flexibility to navigate back and forth between the screens.

All surveys utilized in this study were conducted in the Indonesian language (Bahasa). We implemented a forward–backward translation process into Indonesian following the standard (Tyupa, 2011). This translation procedure consisted of two phases. Initially, an experienced healthcare professional proficient in both English and Indonesian, specializing in gerontological nursing and possessing a deep understanding of Indonesian culture, conducted the initial forward translation. Subsequently, three panel experts meeting specific criteria (such as having a background in geriatric nursing, expertise in LTCF studies in Indonesia, and proficiency in English) performed the reverse translation. Following this, the research team validated the translations to ensure accuracy. The questionnaire underwent translation considering cultural adaptation principles (Guillemin et al., 1993). We used a translator who understands Indonesian culture.

2.3.1. Expectation regarding aging

To measure the expectation of older adults, we used the Expectations Regarding Aging Survey (ERA) short version (ERA-12) (Sarkisian et al., 2005). The ERA-12 survey contained 12 items representing three scales: expectations regarding physical health, mental health, and cognitive function. The ERA-12 confirmed the consistent content to measure expectations regarding aging (Sarkisian et al., 2016). The responses for each question were obtained on a fourth-point Likert scale that measured the expectation from; 1= definitely true to 4 = definitely false. We calculated within the total and subscale scores of ERA-12. For the total score, the sum number for items 1-12. For the total score, we summed the number for items 1-12 then multiplied by 25 and divided by 9 to come up with the 0-100 range score. Higher scores indicate higher overall expectations regarding aging. Whereas for the subscales score, we summed the number of each subscale's items (e.g., expectations regarding physical health = 1-4) then multiplied by 25 and divided by 3 to come up with the 0-100 range score. Higher scores indicate higher expectations regarding aging in each domain. The internal consistency reliability of the total scale and of the individual subscales was acceptable for questionnaires of expectation regarding aging with range of Cronbach's alpha coefficient were 0.67–0.79.

2.3.2. Ageism perspective in time of the COVID-19 pandemic in LTCF

To explore perception toward older adults during the COVID-19 pandemic, we developed the questions based on the literature (Ayalon et al., 2021; Graf & Knepple Carney, 2021; Vale et al., 2020). The content of the questions was about the perception of LTCF's staff regarding the older adult population and the COVID-19 pandemic. After a literature review, ageism perspective in time of the COVID-19 pandemic was categorized into dimensions. There are three dimensions: older adults' vulnerability (e.g., older adults are most vulnerable to being infected with the SARS-CoV-2) with three questions, underestimate of older adults (e.g., older adults have a lower immune system) with three questions, and negative perception (e.g., adults have to stay at LTCFs ultimately to help the health system from collapse) with three questions. All responses were elicited on a 4-point Likert scale, "strongly agree" to "strongly disagree." A higher score indicated higher ageism in the time of COVID-19 pandemic. The content validity of the adherence assessment items was assured by a panel of LTCFs researchers and practitioners (five people). Due to time and resource limitations, the validation process took place through online discussions with experts and no pilot studies were conducted.

2.4. Data analysis

The participant characteristics of nurses and caregivers in the healthcare sector were analysed using descriptive methods. To compare the differences between these groups, a Chi-square test and an independent t-test were conducted. In order to determine the significance of the differences, effect sizes were calculated using Cohen's d for the independent sample t-test, where a small effect size was defined as $d = 0.2$, medium as $d = 0.5$, and large as $d = 0.8$. For the chi-square tests, the phi coefficient was used to measure the effect size, with small defined as $\varphi = 0.1$, medium as $\varphi = 0.3$, and large as $\varphi = 0.5$ (Wolverton et al., 2016). To investigate the variations in expectations regarding aging and perspective ageism between nurses and caregivers, independent sample t-tests were performed. The threshold for determining statistical significance was set at $p<0.05$ (two-tailed). The statistical analysis was conducted using IBM SPSS Statistics Version 26.0, developed by SPSS Inc., an IBM company based in Chicago, IL.

2.5. Ethical considerations

The participants were provided with a description of this research along with the questionnaires. Both the online and offline versions of the questionnaires were accompanied by a research explanation and informed consent statement. In the online questionnaire, participants were provided with a checklist option to indicate their agreement to participate. In the paper-based version, participants could physically sign to signify their agreement. It was explicitly stated that by completing and returning the questionnaires, they would be giving their consent to participate. The study adhered to the principles outlined in the Declaration of Helsinki and received ethical approval from the Universitas Airlangga's committee (approval number 2377-KEPK) for the involvement of human participants.

3. Results

3.1. Characteristic of participants

The participants of this study were 56 nurses and 173 caregivers (Table 1). A total of 20 LTCFs of five biggest islands in Indonesia were contacted to participate. Sixteen LTCFs agreed to participate. The mean age of the participants was 33.1 years. Forty-two percent of them were male. Among all participants, approximately 93% of nurses graduated with a bachelor's degree or higher, while 31% of caregivers had graduated from university. Around 80% were married, and most participants reported good to excellent health.

About the LTCFs' condition, the mean number of beds was 82%, and 75% was public LTCFs (e.g., government facilities for older adults). There was no significant different between nurses and caregivers in about report of response of LTCFs with pandemic COVID-19 to protect older adults.

Table 1. Participant's characteristics

Characteristics	n (%) or Mean±SD						*p*-value	Effect size
	Total (n=229)		Nurse (n=56)		Caregiver (n=173)			
Individual factors (n=229)								
Age (years) (Mean±SD)	39.9±10.3		33.1±7.8		42.1±10.0		<0.001	0.162[a]
Sex (men)	97	(42.4)	14	(25.0)	83	(48.0)	0.004	0.200[b]
Education level (university)	105	(45.9)	52	(92.9)	53	(30.6)	<0.001	0.537[b]
Marital status (married)	185	80.8)	44	(78.6)	141	(81.5)	0.254	0.133[b]
Self-rated health (good-Excellent health)	221	(96.5)	56	(100.0)	165	(95.4)	0.022	0.183[b]
LTCF factors (n=16)								
Unit size (number of beds) (Mean±SD)	81.6±31.7							
Place of LTCF (island)*	5	(100.0)						
Status of LTCF (public facility)	12	(75.0)						
Staff who reported LTCF factors								
Experience of COVID-19 in LTCF	-	-						
Staff reported any older adults LTCF confirmed COVID-19 in LTCF (yes)	140	(61.1)	42	(75.0)	98	(56.6)	0.022	0.162[b]
Response of LTCF with COVID-19 ‖	-	-						
Soon (one month after pandemic)	200	(87.3)	50	(89.3)	150	(86.7)	0.758	0.091[b]
Fast (after two months after pandemic)	24	(10.5)	5	(8.9)	19	(11.0)		
Slow (after 3-4 months after pandemic)	1	(0.4)	0	(0.0)	1	(0.4)		
Late (after 4 months pandemic)	2	(0.9)	1	(1.8)	1	(0.6)		
No response until now	2	(0.9)	0	(0.0)	2	(1.2)		

Notes:
LTCFs: Long-term care facilities, SD: standard deviation
* This study was conducted on the 5 biggest islands in Indonesia. The percentage was counted from 5 biggest islands in Indonesia.
‡ This feeling was reported by participants from the choice bad health, enough health, good health, and very good health.
‖ This was a response from the participant overview of LTCF's response
[a] Differences were compared using the student t-test; the corresponding effect size is Cohen's d (0.2: small, 0.5: medium, and 0.8 large)
[b] Differences were compared using the Chi-square test; the corresponding effect size is Phi coefficient (0.1: small, 0.3: medium, and 0.5 large)

3.2. The expectation regarding aging

For the expectation regarding aging (Table 2), nurses and caregivers have significant different on expectation regarding physical health (p=<0.001), expectations regarding mental health (*p*=<0.001), and total score or global expectations regarding aging (*p*=<0.001). The mean scores of caregivers were higher than nurses.

Table 2. The expectations regarding aging among nurse and caregiver (n=229)[a]

Items	Nurse	Caregiver	*p*-value
	Mean±SD	Mean±SD	
1. When people get older, they need to lower their expectations of how healthy they can be.	1.5±0.7	2.3±1.0	<0.001
2. The human body is like a car: When it gets old, it gets worn out.	1.3±0.6	1.6±0.7	0.002
3. Having more aches and pains is an accepted part of aging.	1.5±0.6	1.8±0.9	0.001
4. Every year that people age, their energy levels go down a little more.	1.3±0.5	1.3±0.5	0.743
5. I expect that as I get older, I will spend less time with friends and family.	1.6±0.7	2.1±1.0	<0.001
6. Being lonely is just something that happens when people get old.	1.5±0.5	1.7±0.7	0.094
7. As people get older, they worry more.	1.3±0.5	1.5±0.6	0.096
8. It's normal to be depressed when you are old.	1.6±0.6	1.9±0.8	0.006
9. I expect that as I get older, I will become more forgetful.	1.6±0.5	1.6±0.7	0.441
10. It's an accepted part of aging to have trouble remembering names.	1.5±0.5	1.8±0.7	0.020
11. Forgetfulness is a natural occurrence just from growing old.	1.4±0.5	1.5±0.6	0.150
12. It is impossible to escape the mental slowness that happens with aging.	1.5±0.7	1.5±0.7	0.892
Expectations regarding physical health	46.1±14.0	58.2±18.8	<0.001
Expectations regarding mental health	49.4±12.3	59.4±19.4	<0.001
Expectations regarding cognitive function	50.0±13.6	53.5±16.4	0.113
Global expectations regarding aging	48.5±9.9	57.0±14.8	<0.001

Notes: [a] The expectations of LTCF's staff regarding older people was measured using the Expectations Regarding Aging Survey (Catherine et al., 2005). The score range between 0-100. Higher scores indicate higher expectations regarding aging.

3.3. *The* perspective ageism in time of pandemic COVID-19

In perspective of ageism (Table 3), we analyzed the issue of ageism which is often mentioned during the COVID-19 pandemic. The mean score of each item of nurses has higher score compare to caregivers. It implie that nurses have a lower attitude toward ageism in time of the COVID-19 pandemic than caregivers. The significant different was observed on older adults being infected with SARS-CoV-2 (*p*=0.029), vulnerable population (*p*=0.007), prone to severity (*p*=0.010), easier to expose virus (*p*=0.033), low income (*p*=<0.001, and older adults must be isolated (*p*=<0.001).

4. Discussion

We explored the expectation regarding aging and ageism during the COVID-19 pandemic at LTCFs from the perspective of healthcare workers, especially nurses and caregivers. To our knowledge, this study is the first study to investigate expectations regarding aging and ageism during the COVID-19 pandemic in LTCFs. The present study found a significant difference between nurses and caregivers in LTCFs regarding their expectations concerning aging and ageism during the COVID-19 pandemic. Nurses exhibited lower expectations regarding aging and held a lower attitude toward ageism during the COVID-19 pandemic compared to caregivers.

Among nurses and caregivers, the expectation regarding aging was significantly different on global expectation, mental health, and physical health, where the nurse's score was lower than the caregiver. This result aligns with the attitude toward older adults, where the nurse's score is lower than the caregiver's score. Overall and subscale scores of nurses and caregivers in this study were lower than in another study among clinicians in primary care (Davis et al., 2011). The lower scores among nurses and caregivers in our study signal a need for targeted interventions to address ageism and enhance the quality of care for older adults in LTCFs. Older adults in LTCFs are at a high risk of becoming agist and neglected (Band-Winterstein, 2013). Ageism in LTCFs is pervasive among health and care workers whose propensity has low qualifications, wages, intention to stay, and self-esteem (Bettio & Verashchagina, 2010; Eltaybani et al., 2018; São José et al., 2019). Therefore, studies on ageism in LTCF facilities still need more attention to improve care and satisfaction for health and care workers (Aloisio et al., 2021). Further research and interventions are essential to foster supportive environments and promote person-centered care in LTCFs.

Table 3. The perspective of ageism in time of the COVID-19 pandemic[b]

Items	Nurse	Caregiver	*p*-value
	Mean±SD	Mean±SD	
1. Older adults are most vulnerable to being infected with the SARS-CoV-2	3.9±0.4	3.8±0.5	0.029
2. Older adults are the most vulnerable population during pandemic Covid-19	3.8±0.5	3.6±0.6	0.007
3. Older adults have several comorbidities so they are prone to severity when infected SARS-CoV-2	3.8±0.4	3.6±0.5	0.010
4. Older adults have a lower immune system, they are easier to expose with SARS-CoV-2	3.7±0.5	3.5±0.6	0.033
5. Older adult has a low income to provide adequate nutrition	3.6±0.5	2.9±0.9	<0.001
6. Older adults have to stay at LTCF completely to help the health system	3.6±0.7	3.0±1.0	<0.001
7. Family should not visit the older adults in LTCF	3.1±0.7	3.0±0.9	0.507
8. Older adults should be avoided to visit health facilities during pandemic Covid-19	2.7±0.7	2.6±1.0	0.463
9. Community health services should be closed during pandemic Covid-19	2.7±0.7	2.7±0.9	0.675

Notes: [b] Ageism in time of pandemic COVID-19 was explored using developed questionnaire based on the studies: (Ayalon et al., 2021; Graf and Knepple Carney, 2021; Vale et al., 2020). The responses were elicited using 4 Linkert scale. Higher score indicated higher attitude on ageism in time pandemic COVID-19.

The ongoing COVID-19 pandemic affects older people, especially those living in LTCFs. This condition appears to have myriad implications for older persons and aging, such as elder abuse, depression, and health service (Arpino et al., 2020; Chang & Levy, 2021; Meeks, 2021). However, it not only affects older adults but healthcare workers also feel the tremendous impact (Bolt et al., 2021; Chutiyami et al., 2022; Maben et al., 2022). This heightened stress has contributed to the perception and manifestation of ageism among healthcare workers, with significant differences noted between nurses and caregivers in their perceptions of older adults' vulnerability, susceptibility to infection, comorbidity prevalence, immune system strength, income levels impacting nutrition, and strain on the healthcare system during the pandemic (Ben-Harush et al., 2017). Notably, nurses exhibit higher scores, potentially reflecting their greater access to information and advanced education, which may enhance their awareness of the challenges faced by older adults during crises such as COVID-19 (Abadio de Oliveira et al., 2019; Wakefield et al., 2021). Higher education and knowledge reduce ageism's prevalence and allow for better whole-person care (Holland et al., 1994). It is imperative that future research focuses on developing targeted educational programs for long-term healthcare workers to reduce ageism and enhance the provision of person-centered care for older adults in LTCFs.

Moreover, the "infodemic" accompanying the COVID-19 pandemic is spreading rapidly, potentially outpacing the spread of the virus itself (Chong et al., 2020). In response, many healthcare facilities have embraced digital care technologies to enhance healthcare delivery. However, the integration of digital technologies into healthcare settings may also influence healthcare professionals' attitudes towards older adults, potentially exacerbating negative and ageist perceptions (Mannheim et al., 2021). Consequently, the COVID-19 pandemic has the potential to significantly impact healthcare workers' perceptions of older adults (Lebrasseur et al., 2021), particularly within LTCFs.

After the COVID-19 pandemic is over, post COVID-19 pandemic has had significant implications for ageism, both in terms of exacerbating existing ageist attitudes and behaviors. The lower expectation regarding aging and perspective ageism during post pandemic COVID-19 can be increased age-based discrimination and longer impact on mental health of older adults (Ayalon et al., 2021; Palmore, 2015). Those condition have highlighted the urgent need to combat ageism and promote intergenerational solidarity.

5. Implications and limitations

Based on this study, we could evaluate the level ageism on LTCFs among healthcare workers. This study can help raise awareness among healthcare workers especially nurses about the presence and impact of ageism within LTCFs. Nursing school should provide education and training programs that address ageism, promote age-inclusive care, and enhance their understanding of the unique needs and experiences of older adults. Nurses have a deeper understanding of the physiology of older adults' bodies, which leads to a more inclusive approach towards ageism. Additionally, nurses play a crucial role in creating a positive and supportive environment within LTCFs. For policymakers, there is a need to reevaluate age-related policies and healthcare systems, as the pandemic has highlighted the importance of equitable healthcare for all age groups.

This study has a number of limitations that should be taken into account when interpreting the results. The small sample size of nurse in each LTCFs and the nationwide distribution of participating LTCFs may impact the generalizability of the findings. At current condition, the number of nurses in each Indonesian LTCFs is limited. Therefore, future longitudinal studies should aim for larger sample sizes within each unit and incorporate the perspectives of older individuals.

6. Conclusion

In conclusion, there were significant difference on the expectation regarding aging and ageism during the COVID-19 pandemic between nurses and caregivers in LTCFs. Nurses have a lower expectation regarding aging and lower attitude toward ageism in time of the COVID-19pandemic. Furthermore, it is crucial for future research to determine whether healthcare workers exhibit ageism from the perspective of the older population themselves.

Acknowledgment

We would like to express our gratitude to the Indonesian government for granting us permission to collect data at LTCF facilities. The authors extend their appreciation to all the participants who took part in this study. The research was supported by the Institute for Research and Community Services (LPPM) at Universitas Airlangga. It is important to note that the grant did not have any involvement in the design, execution, analysis, interpretation of data, or writing of this study.

Author contribution

DWS: Conceptualization, validation process, methodology development, formal analysis, research and investigation, project administration, data curation, funding acquisition, data visualization, writing original draft and review and editing process. EU and NVA: Conceptualization, methodology development, research and investigation, project administration, data curation, funding acquisition, writing process, including review and editing. NDK and GEA: Validation process, research and investigation, project administration, writing process, including review and editing. MNW: conceptualization, methodology development, data curation, providing supervision, writing process, including review and editing.

Conflict of interest

None declared.

References

Aloisio, L. D., Coughlin, M., & Squires, J. E. (2021). Individual and organizational factors of nurses' job satisfaction in long-term care: A systematic review. *International Journal of Nursing Studies*, *123*, 104073. https://doi.org/10.1016/j.ijnurstu.2021.104073

Arpino, B., Pasqualini, M., Bordone, V., & Solé-Auró, A. (2020). Older people's nonphysical contacts and depression during the COVID-19 lockdown. *The Gerontologist*, *61*(2), 176–186. https://doi.org/10.1093/geront/gnaa144

Ayalon, L. (2018). Contemporary perspectives on ageism. In L. Ayalon & C. Tesch-Romer (Eds.), *Contemporary perspectives on ageism* (pp. 263–275). Springer Open. https://doi.org/10.1007/978-3-319-73820-8

Ayalon, L., Chasteen, A., Diehl, M., Levy, B. R., Neupert, S. D., Rothermund, K., Tesch-Römer, C., & Wahl, H. W. (2021). Aging in times of the COVID-19 pandemic: Avoiding ageism and fostering intergenerational solidarity. *Journals of Gerontology: Series B*, *76*(2), E49–E52. https://doi.org/10.1093/geronb/gbaa051

Band-Winterstein, T. (2013). Health care provision for older persons: The interplay between ageism and elder neglect. *Journal of Applied Gerontology*, *34*, 1–15. https://doi.org/10.1177/0733464812475308

Ben-Harush, A., Shiovitz-Ezra, S., Doron, I., Alon, S., Leibovitz, A., Golander, H., Haron, Y., & Ayalon, L. (2017). Ageism among physicians, nurses, and social workers: Findings from a qualitative study. *European Journal of Ageing*, *14*(1), 39–48. https://doi.org/10.1007/s10433-016-0389-9

Bettio, F., & Verashchagina, A. (2012). *Long-term care for the elderly: Provisions and providers in 33 European countries*. Publications Office. https://data.europa.eu/doi/10.2838/87307

Bolt, S. R., van der Steen, J. T., Mujezinović, I., Janssen, D. J. A., Schols, J. M. G. A., Zwakhalen, S. M. G., Khemai, C., Knapen, E. P. A. G. M., Dijkstra, L., & Meijers, J. M. M. (2021). Practical nursing recommendations for palliative care for people with dementia living in long-term care facilities during the COVID-19 pandemic: A rapid scoping review. *International Journal of Nursing Studies*, *113*(2021), 103781. https://doi.org/10.1016/j.ijnurstu.2020.103781

Breda, A. I., & Watts, A. S. (2017). Expectations regarding aging, physical activity, and physical function in older adults. *Gerontology and Geriatric Medicine*, *3*, 233372141770235. https://doi.org/10.1177/2333721417702350

Chang, E. S., & Levy, B. R. (2021). High prevalence of elder abuse during the COVID-19 pandemic: Risk and resilience factors. *American Journal of Geriatric Psychiatry*, *29*(11), 1152–1159. https://doi.org/10.1016/j.jagp.2021.01.007

Chong, Y. Y., Cheng, H. Y., Chan, H. Y. L., Chien, W. T., & Wong, S. Y. S. (2020). COVID-19 pandemic, infodemic and the role of eHealth literacy. *International Journal of Nursing Studies*, *108*, 103644. https://doi.org/10.1016/j.ijnurstu.2020.103644

Chutiyami, M., Bello, U. M., Salihu, D., Ndwiga, D., Kolo, M. A., Maharaj, R., Naidoo, K., Devar, L., Pratitha, P., & Kannan, P. (2022). COVID-19 pandemic-related mortality, infection, symptoms, complications, comorbidities, and other aspects of physical health among healthcare workers globally: An umbrella review. *International Journal of Nursing Studies*, *129*, 104211. https://doi.org/10.1016/j.ijnurstu.2022.104211

Courtney, M., Tong, S., & Walsh, A. (2000). Acute-care nurses' attitudes towards older patients: A literature review. *International Journal of Nursing Practice*, *6*, 62–69.

Courtney, M., & Walsh, A. (2000). Acute-care nurses' attitudes towards older patients: A literature review. *International Journal of Nursing Practice*, *6*(2), 62–69.

Davis, M. M., Bond, L. A., Howard, A., & Sarkisian, C. A. (2011). Primary care clinician expectations regarding aging. *Gerontologist*, *51*(6), 856–866. https://doi.org/10.1093/geront/gnr017

Ding, S., Deng, S., Zhang, Y., Wang, Q., Liu, Z., Huang, J., & Yang, X (2022). *Experiences and needs of front-line nurses during the COVID-pandemic: A systematic review and qualitative meta-synthesis*. *Frontiers in Public Health, 10,* 805631. https://doi.org/10.3389/fpubh.2022.805631

Eltaybani, S., Noguchi-Watanabe, M., Igarashi, A., Saito, Y., & Yamamoto-Mitani, N. (2018). Factors related to intention to stay in the current workplace among long-term care nurses: A nationwide survey. *International Journal of Nursing Studies*, *80*(January), 118–127. https://doi.org/10.1016/j.ijnurstu.2018.01.008

Eom, K., Penkunas, M. J., & Chan, A. W. M. (2017). Effect of caregiving relationship and formal long-term care service use on caregiver well-being. *Geriatrics and Gerontology International*, *17*(10), 1714–1721. https://doi.org/10.1111/ggi.12958

Gaugler, J. E. (2014). Long-term care: Multiple methods and multiple perspectives. *Journal of Applied Gerontology*, 33(6), 651–654). https://doi.org/10.1177/0733464814544088

Graf, A. S., & Knepple Carney, A. (2021). Ageism as a modifying influence on COVID-19 health beliefs and intention to social distance. *Journal of Aging and Health*, *33*(7–8), 518–530. https://doi.org/10.1177/0898264321997004

Guillemin, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal Clinical Epidemiology*, *346*(12), 1417–1432. https://doi.org/https://doi.org/10.1016/0895-4356(93)90142-N

Herdman, E. (2002). Challenging the discourses of nursing ageism. *International Journal of Nursing Studies*, *39*(1), 105–114. https://doi.org/10.1016/S0020-7489(00)00122-X

Holland, B. E., Roberts, K. T., Van Stewart, A., & Wright, J. C. (1994). Life span geriatric interdisciplinary curriculum for preparing future health care professionals. *Educational Gerontology*, *20*(3), 231–239. https://doi.org/10.1080/0360127940200303

Hunt, A. (2012). *A researcher's guide to power analysis*. pp 1–11. https://rgs.usu.edu/irb/files/uploads/A_Researchers_Guide_to_Power_Analysis_USU.pdf

Kagan, S. H. (2020). Ageism, older people, and hospitalization: Walking a path through the past, looking to lead in the future. *Geriatric Nursing*, *41*(5), 654–656. https://doi.org/10.1016/j.gerinurse.2020.08.012

Kagan, S. H., & Melendez-Torres, G. J. (2015). Ageism in nursing. *Journal of Nursing Management*, *23*(5), 644–650. https://doi.org/10.1111/jonm.12191

Kessler, E.-M., & Bowen, C. E. (2020). COVID ageism as a public mental health concern. *The Lancet Healthy Longevity*, *1*(1), e12. https://doi.org/10.1016/s2666-7568(20)30002-7

Lebrasseur, A., Fortin-Bédard, N., Lettre, J., Raymond, E., Bussières, E. L., Lapierre, N., Faieta, J., Vincent, C., Duchesne, L., Ouellet, M. C., Gagnon, E., Tourigny, A., Lamontagne, M. È., & Routhier, F. (2021). Impact of the COVID-19 pandemic on older adults: Rapid review. *JMIR Aging, 4*(2), e26474. https://doi.org/10.2196/26474

Lehnert, T., Heuchert, M., Hussain, K., & König, H. H. (2019). Stated preferences for long-term care: A literature review. *Ageing and Society*, *39*(9), 1873–1913. https://doi.org/10.1017/S0144686X18000314

Loy-Ashe, T., Hawkins, B., Van Puymbroeck, M., Lewis, S., & Hays, A. (2024). Assessing the prevalence of gendered ageism among long-term care employees. *Journal of Long-Term Care, 2024*, 77–89. https://doi.org/10.31389/jltc.157

Maben, J., Conolly, A., Abrams, R., Rowland, E., Harris, R., Kelly, D., Kent, B., & Couper, K. (2022). 'You can't walk through water without getting wet' UK nurses' distress and psychological health needs during the Covid-19 pandemic: A longitudinal interview study. *International Journal of Nursing Studies*, *131*, 104242. https://doi.org/10.1016/j.ijnurstu.2022.104242

Mannheim, I., Wouters, E. J. M., van Boekel, L. C., & van Zaalen, Y. (2021). Attitudes of health care professionals toward older adults' abilities to use digital technology: Questionnaire study. *Journal of Medical Internet Research*, *23*(4) e26232. https://doi.org/10.2196/26232

Marques, S., Mariano, J., Mendonça, J., De Tavernier, W., Hess, M., Naegele, L., Peixeiro, F., & Martins, D. (2020). Determinants of ageism against older adults: A systematic review. *International Journal of Environmental Research and Public Health, 17*(7), 2560. https://doi.org/10.3390/ijerph17072560

Meeks, S. (2021). Gerontology in a time of pandemic: An introduction to the special collection. *The Gerontologist*, *61*(1), 1–2. https://doi.org/10.1093/geront/gnaa195

Nelson, T. D. (2005). Ageism: Prejudice against our feared future self. *Journal of Social Issues*, *61*(2), 207–221. https://doi.org/10.1111/j.1540-4560.2005.00402.x

Palmore, E. (2015). Ageism comes of age. *Journals of Gerontology - Series B*. 70(6), 873–875. https://doi.org/10.1093/geronb/gbv079

Rhee, T. G., Marottoli, R. A., Van Ness, P. H., & Levy, B. R. (2019). Impact of perceived racism on healthcare access among older minority adults. *American Journal of Preventive Medicine*, *56*(4), 580–585. https://doi.org/10.1016/j.amepre.2018.10.010

Robb, C., Chen, H., & Haley, W. E. (2002). Ageism in mental health and health care: A critical review. *Journal of Clinical Geropsychology*, *8*, 1–12.

São José, J. M. S. De, & Amado, C. A. F. (2017). On studying ageism in long-term care: A systematic review of the literature. *International Psychogeriatrics*, *29*(3), 373–387. https://doi.org/10.1017/S1041610216001915

São José, J. M. S., Amado, C. A. F., Ilinca, S., Buttigieg, S. C., & Taghizadeh Larsson, A. (2019). Ageism in health care: A systematic review of operational definitions and inductive conceptualizations. *Gerontologist*, *59*(2), E98–E108. https://doi.org/10.1093/geront/gnx020

Sarkisian, C. A., Hays, R. D., Berry, S. H. ., & Mangione, C. M. (2016). Expectations regarding aging among older adults and physicians who care for older adults. *Medical Care*, *39*(9), 1025–1036. https://www.jstor.org/stable/3767781

Sarkisian, C. A., Steers, W. N., Hays, R. D., & Mangione, C. M. (2005). Development of the 12-item expectations regarding aging survey. *Gerontologist*, *45*(2), 240–248. https://doi.org/10.1093/geront/45.2.240

Shaw, C., Ward, C., Gordon, J., Williams, K., & Herr, K. (2022). Characteristics of elderspeak communication in hospital dementia care: Findings from the nurse talk observational study. *International Journal of Nursing Studies*, *132,* 104259 https://doi.org/10.1016/j.ijnurstu.2022.104259

Silva, M. F., da Silva, D. S. M., de Macedo Bacurau, A. G., Francisco, P. M. S. B., de Assumpção, D., Neri, A. L., & Borim, F. S. A. (2021). Ageism against older adults in the context of the COVID-19 pandemic: An integrative review. *Revista de Saude Publica*, *55*, 1–13. https://doi.org/10.11606/s1518-8787.2021055003082

Swift, H. J., & Chasteen, A. L. (2021). Ageism in the time of COVID-19. *Group Processes and Intergroup Relations, 24*(2), 246–252. https://doi.org/10.1177/1368430220983452

Tyupa, S. (2011). A theoretical framework for back-translation as a quality assessment tool. *New Voices in Translation Studies, 7*(1), 35–46.

Vale, M. T., Stanley, J. T., Houston, M. L., Villalba, A. A., & Turner, J. R. (2020). Ageism and behavior change during a health pandemic: A preregistered study. *Frontiers in Psychology*, *11,* 587911. https://doi.org/10.3389/fpsyg.2020.587911

Voss, P., Bodner, E., & Rothermund, K. (2018). Ageism: The relationship between age stereotypes and age discrimination. In *Contemporary Perspectives on Ageism, 19,* 11–31. https://doi.org/10.1007/978-3-319-73820-8

Wakefield, M. K., Williams, D. R., Menestrel, S. Le, & Flaubert, J. L. (Eds.). (2021). *The Future of Nursing 2020-2030*. National Academies Press. https://doi.org/10.17226/25982

Wolverton, S., Dombrosky, J., & Lyman, R. L. (2016). Practical significance: Ordinal scale data and effect size in zooarchaeology. *International Journal of Osteoarchaeology*, *26*(2), 255–265. https://doi.org/10.1002/oa.2416

World Health Organization. (2021). *Global report on ageism*. World Health Organization. https://www.who.int/publications/i/item/9789240016866

Yanez, N. D., Weiss, N. S., Romand, J. A., & Treggiari, M. M. (2020). COVID-19 mortality risk for older men and women. *BMC Public Health*, *20*(1), 1–7. https://doi.org/10.1186/s12889-020-09826-8

Nurse Media
JOURNAL OF NURSING

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):96-109, April 2024
https://doi.org/10.14710/nmjn.v14i1.61652

ORIGINAL RESEARCH

Effectiveness of Self-Management Training, "EDUDARA," on Psychological Wellbeing and Cortisol Levels in Breast Cancer Patients during the COVID-19 Pandemic

Lilik Supriati[1], Renny Nova[1], Muhammad Rodli[2], Ahsan Ahsan[1], Nur Hidaayah[3], I Dewa Ayu Rismayanti[4]

[1]*Department of Nursing, Faculty of Health Sciences, Universitas Brawijaya, Malang, Indonesia*
[2]*Institute of Science, Technology and Health, Rumah Sakit Dr. Soepraoen, Malang, Indonesia*
[3]*Department of Nursing, Faculty of Nursing, Universitas Nahdlatul Ulama, Surabaya, Indonesia*
[4]*Doctor in Nursing, Nursing Program, Sekolah Tinggi Ilmu Kesehatan Buleleng, Bali, Indonesia*

Article Info

Article History:
Received: 21 January 2024
Revised: 19 April 2024
Accepted: 22 April 2024
Online: 30 April 2024

Keywords:
Breast cancer; cortisol level; psychological wellbeing; self-management

Corresponding Author:
Lilik Supriati
Department of Nursing, Faculty of Health Sciences, Universitas Brawijaya, Malang, Indonesia
Email: liliks.83@ub.ac.id

Abstract

Background: Women diagnosed with breast cancer often experience emotional distress, leading to a decrease in psychological well-being. Online self-management training during the COVID-19 pandemic is crucial for maintaining psychological well-being, as it is closely related to stress hormone cortisol levels, which play a vital role in boosting the body's immune system. However, research on self-management strategies for breast cancer patients, particularly regarding psychological aspect and its relationship to cortisol levels during the COVID-19 pandemic, remains limited.
Purpose: The purpose of this study was to measure the effectiveness of self-management training on psychological well-being and salivary cortisol levels in breast cancer patients.
Methods: This study used a pre-post-test quasi-experimental design with a control group. The participants included 70 breast cancer patients undergoing chemotherapy at a hospital in Malang City, East Java, Indonesia, recruited using simple random sampling. Self-management training using the EDUDARA *(Edukasi Kanker Payudara)* was administered to the participants in the intervention group for six weeks. Data on wellbeing were collected using the Ryff Psychological Wellbeing Questionnaire, while salivary cortisol levels were measured with the DBD cortisol kit using the competitive ELISA method. SPSS with t-tests was used to analyze the data.
Results: The average post-test psychological well-being score in the intervention group was 90.3, while in the control group, it was 82.69. The results of statistical tests showed a significant difference in psychological well-being between the two groups, with the intervention group showing greater improvement after the training. Additionally, the mean salivary cortisol level post-training was 4.531 in the intervention group and 6.169 in the control group (p=0.001). This indicates a greater reduction in cortisol levels in the intervention group after training, showing that participants' psychological condition following the "EDUDARA" training was better than that of the control group.
Conclusion: Self-management training had a positive effect on increasing psychological well-being and decreasing salivary cortisol levels among breast cancer patients. Therefore, structured self-management training for these patients can be used for nursing intervention

How to cite: Supriati, L., Nova, R., Rodli, M., Ahsan, A., Hidaayah, N., & Rismayanti, I. D. A. (2024). *Nurse Media Journal of Nursing, 14*(1), 96-109. https://doi.org/10.14710/nmjn.v14i1.61652

1. Introduction

The incidence of COVID-19 in Indonesia, collected from 514 districts since the first cases were detected until February 2021, has reached 41,682 people (Surendra et al., 2023). The spike in COVID-19 cases during the second wave of the pandemic in Indonesia was very significant. Data showed an increase in new active cases by 56.6% and in death cases by 3.52% (Ministry of Health Republic of Indonesia, 2023. In fact, five provinces in Indonesia experienced a spike of above 50%. Data from the Indonesian Ministry of Health showed, as of 29 April 2023, there were 161,272 deaths (2.38%) and 6,773,146 confirmed cases associated with COVID-19. In contrast to worldwide data, Indonesia's covid-19 fatality rate was comparatively elevated (Ministry of Health Republic of Indonesia, 2023; Novarisa et al., 2023). The death rate of COVID-19 in East Java is around 6.92% (Mahendradhata et al., 2022; Supriati et al., 2022).

Breast cancer is the most frequent type of cancer that causes death in women (Bray et al., 2018). It is the most commonly treated cancer in hospitals in Indonesia (Supriati et al., 2022). The first report on the discovery of COVID-19 in cancer patients was submitted in February 2020, with 18 patients in China diagnosed with COVID-19, and as many as 39% were treated intensively (Guan et al., 2020). The pandemic has created stressor for breast cancer patients (Guan et al., 2020; Supriati et al., 2023), and it had effect on disruption to the cancer care system, including the shift to virtual consultations, limited family visits and therapy, and a large amount of information on alternative treatment offers (Koinig et al., 2021; Verma et al., 2022). Previous study mentioned that 80% of breast cancer patients paid more attention to their own health and as many as 17% reported delaying treatment appointments at the hospital for fear of being infected with the COVID-19 virus; they also tended to worry about visiting the hospital (Koinig et al., 2021). During the COVID-19 outbreak, all countries have implemented of social limitations and individual limitation to decrease the spread of infection, including the number of visits by cancer patients (Viale et al., 2020). Furthermore, the COVID-19 pandemic has given rise to the uncertainty perception regarding cancer and increase the fear of COVID-19 death related to their cancer. Consequently, it has resulted in many negative emotional responses among breast cancer patients (Arambasic et al., 2019; Koinig et al., 2021).

Breast cancer patients experience a decrease in psychological wellbeing related to emotional distress during the COVID-19 pandemic (Maculaitis et al., 2023). In this regard, psychological factors can affect immunological and endocrine function. It is widely recognized that stress can influence the formation and spread of tumors through these routes (Ramírez-Expósito et al., 2021). A previous study mentioned that psychological wellbeing is associated with stress cortisol hormone and decreased natural killer (NK) cell activity, thereby potentially increasing cancer recurrence, although research results are still inconsistent (Pace et al., 2021; Ramírez-Expósito et al., 2021). Adrenocorticotropin and cortisol are released into the bloodstream in reaction to stress due to the hypothalamic-pituitary-adrenal axis being activated. The adrenal cortex produces the glucocorticoid hormone cortisol from cholesterol. The cortisol called "stress hormone" is only released under stressful circumstances (Soetrisno et al., 2020). Stress causes illness that are dependent on chemicals like cortisol, catecholamines, and immune system degradation; these mediators affect DNA repair mechanisms as well as the growth and spreading of cancer (Ortega et al., 2020). Cortisol is the most widely used stress hormone as an indicator of stress in humans, although its relationship to psychological wellbeing is still contradictory. The relationship between psychological problems of stress and cortisol is influenced by various conditions of cancer patients. There was no direct relationship found between stress and cortisol levels, but it was mediated by the type and amount of therapy (Frausto et al., 2020). Stress and psychological wellbeing are different aspects, but interrelated. Psychological wellbeing has a positive influence on patient health (Hernandez et al., 2018). Patients with higher psychological wellbeing will have better mental and physical health than patients with lower psychological wellbeing. Hence, it is important to know about the cortisol level of breast cancer patient during stressful conditions in the COVID-19 pandemic.

Furthermore, breast cancer requires considerable emotional management skills (Ahmadzadeh et al., 2021). The paradigm of treating cancer patients has changed; it must be managed like a chronic disease that requires long-term surveillance and good skill self-management. Clinical research has turned attention to improving the quality of life, functioning and psychosocial health and self-care behaviour of patients (Luo et al., 2022). Since there was a surge in the second wave of COVID-19 virus infection, it was not possible for patients to visit the hospital directly freely and there was limited information about self-management of the disease and the emotions felt by patients because of fears of the spread of the virus. Therefore, it is needed to use technology to give training related to self-management among patients. Mental health management is a field that has seen rapid progress in the field of online training; however, it is still rare to focus on self-management behaviour in breast cancer patients (Lally et al., 2019; Mohammadzadeh et al., 2022).

In this study, we developed EDUDARA *(Edukasi Kanker Payudara),* an online web program education about self-management for breast cancer patients during the COVID-19 pandemic. This application provides knowledge and skills for patients in managing disease and psychological problems related to breast cancer during the pandemic. Limited patients visited hospitals during the pandemic, and EDUDARA makes it easy for patients to manage the psychological problems and stress. It consists of information about cancer, management of chemotherapy side effects, pain management, stress management, uncertainty management and an online guide on how to affirm and be grateful by interpreting life positively. EDUDARA is carried out with the concept of combined education and training online by phone, web and also visiting patients' homes one by one with due observance of strict health protocols in preventing COVID-19.

Due to limited access to hospital visits during the COVID-19 pandemic, causing psychological problems and limited health information access, cancer patients must be able to carry out self-management behaviour. Patients need to be given an approach to manage their disease by self-management training using EDUDARA through easy online web access. Self-management refers that patients must adjust their behavior in order to accomplish life objectives, satisfaction, wellbeing, and the ability to control stressful situations. The COVID-19 pandemic has caused substantial changes in life, therefore, patients must be able to self-manage their illness, side effects of treatment, and emotions more actively (Kong et al., 2022; McBride et al., 2021). Interventions delivered online are important to break barriers to provide information about self-management during the COVID-19 pandemic (Smith et al., 2020). However, research on self-management strategies for breast cancer patients, particularly regarding psychological aspect and its relationship to cortisol levels during the COVID-19 pandemic, remains limited. Accordingly, this study was conducted to examine the effectiveness of EDUDARA self-management training on psychological wellbeing of breast cancer patients, which is also associated with their cortisol levels.

2. Methods

2.1. Research design

This study used a pre-post-test quasi-experimental design with a control group. This design was chosen to assess the differences in psychological well-being and cortisol levels between two groups: the intervention group and the control group, with randomization.

2.2. Setting and samples

This study was conducted at one of the hospitals in Malang City, East Java, where patients receive chemotherapy services and also serves as a hospital for the treatment of COVID-19 patients. This situation has impacted the health services, particularly as the hospital must limit the number of chemotherapy sessions for breast cancer patients. The data were collected from March to August 2022. The population consisted of 110 cancer patients aged between 26 and 60 years old. Normally, approximately 10 patients with breast cancer underwent chemotherapy at this hospital every day. However, during the COVID-19 pandemic, there was a five-patient daily maximum for chemotherapy patients. The sample size was determined using the two-sample mean formula, taking into account the risk of dropout (Sugiyono, 2019). It was calculated that 35 respondents per group were required, resulting in a total of 70 samples. These samples were were divided into two groups: the intervention group and the control group, using simple random sampling techniques.

The inclusion criteria included breast cancer patients who had already undergone one cycle of chemotherapy and had access to a mobile phone. The exclusion criteria were patients who had taken anti-anxiety and anti-depressant drugs in the month prior to the study, those with weak or decreased consciousness, and patients with mental disorders. The randomization technique involved the drawing of numbers, with patients assigned to the intervention group if they received an even number and to the control group if they received an odd number. To minimize bias, a homogeneity test was conducted on characteristics such as cancer stage, age, education level, and socioeconomic status. This was done to ensure that any differences in psychological well-being and cortisol levels after the intervention were attributable to the effects of the intervention rather than other factors. The recruitment of the participants is illustrated in Figure 1.

2.3. Intervention

The intervention provided to the intervention group involved a self-management program using EDUDARA. In this study, EDUDARA stands for *"Edukasi Kanker Payudara,"* which translates to breast cancer education. Its core application revolves around educating individuals about breast cancer, chemotherapy, pain and emotional management, as well as guiding them on interpreting life with breast cancer and fostering positive thinking. EDUDARA is an online application accessible via mobile phones and a web-based system, ensuring easy download and free access for patients anytime and anywhere.

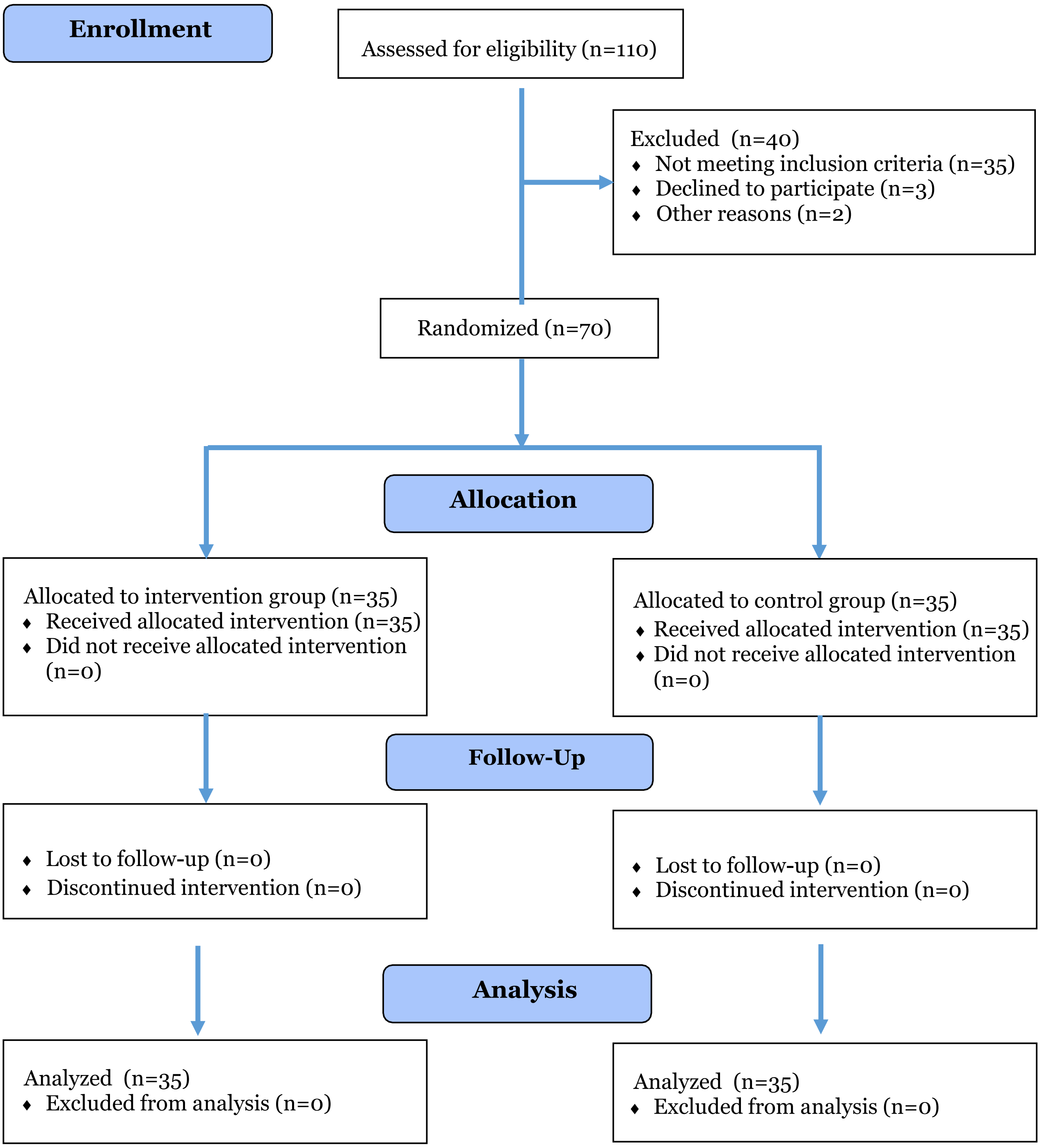

Figure 1. The recruitment of the participants

EDUDARA was developed based on evidence from previous research, such as studies on self-management related to physical activity management, which positively impact patients' quality of life and have the potential to improve BCS oncological issues (Bò et al., 2023). Other research incorporated into the development of EDUDARA focuses on self-management to enhance education by improving literacy understanding among breast cancer patients (Ahmadzadeh et al., 2021). It was found that aspects of self-care, such as self-care confidence, self-care management, and self-care maintenance, and aspects of health literacy, such as access, reading, assessment, decision-making, and understanding, are positively and significantly correlated (Ahmadzadeh et al., 2021). EDUDARA was delivered both offline and online based on previous research showing that providing self-management via cellphone for a minimum of four weeks has a significant impact on emotional regulation abilities in breast cancer patients (Mohammadzadeh et al., 2022). This self-management training serves as an effective intervention in reducing stress and the hormone cortisol in breast cancer patients for at least one month (Mészáros Crow et al., 2023), thus the EDUDARA training was conducted for six weeks.

The intervention consisted of online and offline components, including: (1) the concept of self-management to improve the psychological wellbeing of breast cancer patients, (2) Informational support materials about breast cancer and chemotherapy, (3) Emotional management and pain management, and (4) Telephone follow-up to monitor the self-management exercises and address obstacles faced that were given twice by phone. This intervention was delivered by a team including nurses, doctors, and two palliative volunteers. All information was provided online via handphone and downloadable modules. The implementation of EDUDARA self-management training comprised four sessions for each respondent, three of which were face-to-face sessions and one session conducted via telephone. These sessions included: Session 1 (week 1): Self-regulation material to improve the psychological wellbeing of breast cancer patients for 45 minutes; Session 2 (week 2): Informational support materials about cancer and chemotherapy for 30 minutes; Session 3 (week 3): Emotional management and pain management for 60 minutes; Session 4, 5 (week 4, 5): Telephone follow-up to monitor self-management exercises and address obstacles faced; Session 6 (week 6): Post test. The details of the intervention are provided in Table 1.

EDUDARA was developed through discussions with oncology doctors, palliative teams, and representatives of breast cancer patients, along with technology and informatics experts. The control group did not receive the intervention but followed standard therapy provided by nurses at the hospital, which included a single session of breast cancer education. Pre-tests were conducted in both groups before self-management training to measure psychological wellbeing and cortisol levels, with post-tests conducted after week 6 of interventions.

Table 1. The details of the intervention

Group	Stage of intervention	Duration	Session	Purpose
Intervention group	Concept of self-management in breast cancer	1 x 45 minutes for each patient	Session 1 (week 1)	Increase understanding of self-management in improving psychological wellbeing
	Information support materials about breast cancer and chemotherapy	1 x 30 minutes for each patient	Session 2 (week 2)	Increase knowledge about breast cancer and chemotherapy
	Pain and Emotional management	1 x 60 minutes for each patient	Session 3 (week 3)	Increase knowledge, skills, and experience of breast cancer patients in emotional and pain management
	Follow up by telephone	2 x 15 minutes for each patient by phone	Session 4 and 5 (week 4 and 5)	Assess self-management exercises performed by patients and address any obstacles faced
	Post test	-	Session 6 (week 6)	-
Control group	Breast cancer education	1 x 45 minutes for each patient	Session 1 (week 1)	Increase knowledge about breast cancer diseases through leaflets

2.4. Measurement and data collection

This study used the Ryff's Psychological Wellbeing Scale for data collection (Ryff, 1989). This instrument consisted of 30 closed-ended questions that assess six indicators, including self-acceptance (questions 1-5), autonomy (questions 6-10), environmental mastery (questions 11-15), relationships with others (questions 16-20), personal growth (questions 21-25), and life goals (questions 26-30). A Likert scale with four options was employed: 1 for never, 2 for sometimes, 3 for often, and 4 for always. Total scale scores for psychological wellbeing ranged from 30 to 120, categorized as follows: scores of 30-75 indicating negative psychological wellbeing, and scores of 76-120 indicating positive psychological wellbeing. All scores were analyzed as continuous variables. The questionnaire was forward translated from English into Bahasa it was also adapted to the context of the investigation. Translation and adaptation were performed by a professional language translator, and the validated retranslation into English was also conducted (Muttaqin, 2022; Villarosa & Ganotice, 2018). The validity of the questionnaire was conducted among 30 breast cancer patients with characteristics matching those of the resaerch respondents in a hospital in Batu City, East Java. The resulting product moment values for all question items exceeded 0.361, confirming their validity. Initially, the 30-item psychological wellbeing instrument yielded 27 valid items and three invalid ones. To ensure balance across sub-indicators, the invalid questions underwent sentence statement revisions and were retested for validity, all of which were subsequently validated. The reliability value, indicating consistency in measuring psychological wellbeing variables, was 0.925.

The measurement of cortisol was conducted by examining the patient's saliva before and after the intervention by professionals in the physiology laboratory of the Faculty of Medicine, Universitas Brawijaya. Salivary examination was performed using the DBD cortisol kit with the competitive ELISA method. Measurements were taken in the morning between 8-10 a.m. The saliva samples from patients were taken using a specific micro pipette and stored in a box with ice during transfer to the laboratory. Upon arrival in the laboratory, the samples were frozen at a temperature of -4 to -10 degrees Celsius for at least 2 hours before undergoing centrifugation. Centrifugation was conducted at a speed of 100-250 rpm for 5 to 8 minutes to separate the enzyme/ supernatant precipitate. The laboratory assistant then carefully extracted the necessary enzyme for examination and stored it in a small tube in the refrigerator until all samples were obtained. Subsequently, the samples underwent a mixing process using an ELISA kit, following calibration based on predetermined standard values using a computer program. Analysis was performed by the laboratory assistant, who later presented the results, along with standard values, to the researcher. The significance of the results from the ELISA kit, as indicated by color changes and analysis indicators, was explained during this presentation.

This study also collected demographic data of the respondents, including the education, age, marital status, illness severity, cancer stage, lenght of sickness, occupation, and economic status. This study involved nurses in the chemotherapy room as providers of information about patients who met the research inclusion criteria. The process of filling out the demographic questionnaire was carried out when the patient came to the hospital for chemotherapy. Compliance with the strict COVID control protocol at the hospital was carefully ensured. Patients were given an informed consent regarding the purpose, process and mechanism of involvement in research. If they agreed, the next meeting would be held by visiting the patient's house in accordance with the intervention procedures carried out by the researcher.

2.5. Data analysis

Demographic characteristics were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation). The Chi-square test was used to depict demographic differences between the patients in the intervention and control groups. The Shapiro-Wilk test was also used to determine whether the data were normally distributed. The independent samples t-test and paired t-samples test were used to identify intragroup and intergroup differences in psychological wellbeing before and after the training to determine if the data were normally distributed. The results of the data normality test showed a p-value < 0.05, indicating that psychological wellbeing had an abnormal distribution, so the Wilcoxon and Mann-Whitney tests were used.

2.6. Ethical considerations

This study obtained ethical approval from the Institutional Review Board (IRB) of the Faculty of Nursing, Universitas Airlangga, with a reference number 2386-KEPK. Respondents were contacted based on predetermined criteria and provided with a clear explanation of the study's objectives. They were also given detailed information about the research, including its aims, procedures, potential discomfort, risks, benefits, and consequences of participation. Subsequently, they signed an informed consent form for their participation.

3. Results

3.1. Characteristics of the participants

Table 2 shows the characteristics of the respondents. Based on the table, most of respondents in both groups had an elementary school education level, with most of them being unemployed, and the highest cancer stage observed was stage II. The average age of the respondents was 47 years, and the average duration of illness was 1-5 years. The results of the homogeneity test, conducted using the Chi-square test for categorical data and the Mann-Whitney test for the age variable, indicated that patient characteristics (education, age, marital status, severity, stage, duration of illness, occupation, and economy) were homogeneous between the intervention and control groups (*p*>0.05).

3.2. Psychological wellbeing and salivary cortisol levels

Table 3 provides a description of the dependent variables. It indicates that the psychological wellbeing scores before intervention on average were 83.89 and 80.46 in the intervention and control groups, respectively. Both of theme were in the positive psychological wellbeing category. Following the intervention, the average post-test psychological wellbeing score increased to 90.3 in the intervention group and to 82.69 in the control group. Across all indicators of psychological wellbeing—self-acceptance, autonomy, environmental mastery, relationships with others, and personal growth—scores in the intervention group showed improvement. Regarding cortisol levels, the average pre-test cortisol level in the intervention group was 6.221, and the post-test level was 4.531, while in the control group, the pre-test score was 6.136, and the post-test score was 6.169. This indicates that the average cortisol levels in the intervention group decreased more after receiving the EDUDARA self-management training compared to the control group.

Table 2. Characteristics of the respondents

Characteristic	Intervention Group (n=35)	Control Group (n=35)	*p*-value
	n (%)	n (%)	
Education			
Elementary school	13(37.1)	15(42.9)	0.438
Junior high school	12(34.3)	7(20.0)	
Senior high school	5(14.3)	9(25.7)	
University	5(14.3)	4(11.4)	
Age			
Mean ± SD	48.06±7.91	48.34±7.56	0.855
Minimum- *Maximum*	36 – 60	36 – 64	
Marital status			
Married	21(60.0)	24(68.6)	0.618
No married	14(40.0)	14(31.4)	
Illness severity			
Normal	17(48.6)	15(42.9)	0.560
Limited to light activity	13(37.1)	17(48.6)	
50% Time still ambulatory	5(14.3)	3(8.6)	
Cancer stage			
I	3(8.6)	3(8.6)	0.950
II	18(51.4)	20(57.1)	
III	11(31.4)	10(28.6)	
IV	3(8.6)	2(5.7)	
Length of sickness			
3 months -1 year	16(45.7)	15(42.9)	1.000
1 - 5 year	19(54.3)	20(57.1)	
Occupation			
Employed	16(45.7)	16(45.7)	1.000
Unemployed	19(54.3)	19(54.3)	
Economic status			
Low	24(68.6)	21(60.0)	0.618
High	11(31.4)	14(40.0)	

Table 3. Psychological wellbeing and salivary cortisol levels

Variable	Descriptive	Intervention Group		Control Group	
		Pre-test	Post-test	Pre-test	Post-test
Psychological wellbeing	Minimum	60	72	59	59
	Maximum	107	117	107	108
	Mean	83.89	90.63	80.46	82.69
	Standard Deviation	13.02	12.92	12.72	11.38
Self-acceptance	Minimum	10	11	10	11
	Maximum	19	19	20	19
	Mean	14.29	15.11	13.20	13.40
	Standard Deviation	3.121	2.99	3.18	2.92
Autonomy	Minimum	10	13	10	10
	Maximum	19	19	19	18
	Mean	13.83	14.94	13.66	13.74
	Standard Deviation	2.76	1.76	2.9	1.86
Environmental mastery	Minimum	10	12	10	12
	Maximum	19	19	19	19
	Mean	13.91	15.63	13.43	14.2
	Standard Deviation	2.46	2.237	2.20	1.86
Relationship with others	Minimum	10	11	11	11
	Maximum	19	19	19	19
	Mean	14.69	15.97	14.14	14.26
	Standard Deviation	2.518	2.32	2.636	2.513
Personal growth	Minimum	9	12	9	9
	Maximum	19	19	19	19
	Mean	14.14	15.23	13.29	13.63
	Standard Deviation	2.366	1.75	2.321	2.129
Life purpose	Minimum	10	11	9	9
	Maximum	17	19	17	17
	Mean	13.17	14.83	12.89	13.54
	Standard Deviation	1.689	2.358	2.026	2.241
Salivary cortisol	Minimum	1.78	1.08	1.462	1.25
	Maximum	15.2	9.99	16.56	15.87
	Mean	6.221	4.531	6.136	6.169
	Standard Deviation	3.242	2.584	3.666	3.424

3.3. Comparison of psychological wellbeing in the intervention and control groups

Table 4 shows that the results of statistical analysis using the Wilcoxon test in the experimental group for psychological well-being yielded a significance value of $p<0.05$. Therefore, it can be stated that there was a significant effect of the self-management training EDUDARA intervention on psychological well-being and all of its indicators (self-acceptance, autonomy, environmental mastery, relationships with others, personal growth, and life purpose) in the intervention group. Similarly, in the control group, using the paired t-test on the psychological well-being variable also yielded a significant value ($p<0.05$). However, in the control group, only the indicators of environmental mastery, personal growth, and life purpose showed significant differences.

Furthermore, differences in delta values (post-test – pre-test) for all variables were tested using the Mann-Whitney test because the distribution of the mean difference of pre-post in this study was not normally distributed. The test results for the mean different values of psychological well-being and their indicators in the two groups can be seen in Table 5, which shows the different test results of psychological well-being delta values (mean difference pre-post). The results depicted a significant difference between the intervention and control groups ($p=0.021$), as well as all psychological well-being indicators, namely self-acceptance, autonomy, environmental mastery, relationships with other people, personal growth, and life purpose. Psychological well-being and all indicators in the intervention group increased higher than in the control group.

Table 4. Comparison of psychological wellbeing in the intervention and control groups

Variables	Mean±SD Intervention group			Mean±SD Control group		
	Pre	Post	*p*	Pre	Post	*p*
Psychological wellbeing	83.89±13.02	90.63±12.92	0.000 [b]	80.46±12.72	82.69±11.38	0.030[a]
Indicators						
Self-acceptance	14.29±3.121	15.11±2.99	0.002 [b]	13.20±3.18	13.74±1.86	0.299[b]
Autonomy	13.83±2.76	14.94±1.76	0.003 [b]	13.66±2.9	13.74±1.86	0.645[b]
Environmental mastery	13.91±2.46	15.63±2.237	0.000 [b]	13.43±2.20	14.2±1.86	0.005[b]
Relationship with others	14.69±2.518	15.97±2.32	0.006 [b]	14.14±2.636	14.26±2.513	0.947[b]
Personal growth	14.14±2.366	15.23±1.75	0.009 [b]	13.29±2.321	13.63±2.129	0.017[b]
Life purpose	13.17±1.689	14.83±2.358	0.000 [b]	12.89±2.026	13.54±2.241	0.000[b]

Notes: [a]: Paired t-test; [b]: Wilcoxon Test

Table 5. The difference in delta values for psychological well-being between the intervention and control groups

Variable	Group	Delta (Δ)	*Sig.*
Psychological wellbeing	Intervention	6.74	0.021
	Control	2.23	
Indicators			
Self-acceptance	Intervention	0.82	0.015
	Control	0.54	
Autonomy	Intervention	1.11	0.015
	Control	0.08	
Environmental mastery	Intervention	1.72	0.028
	Control	0.77	
Relationship with others	Intervention	1.28	0.007
	Control	0.12	
Personal growth	Intervention	1.09	0.003
	Control	0.34	
Life purpose	Intervention	1.66	0.043
	Control	0.65	

3.4. Comparison of salivary cortisol levels in the intervention and control groups

Table 6 shows that in the intervention group, the mean salivary cortisol level was 6.221, while in the control group, it was 6.136. The results of the Wilcoxon test in the intervention group for salivary cortisol levels yielded a significance value of $p<0.05$. Therefore, it can be stated that there was a significant effect of EDUDARA self-management on salivary cortisol in breast cancer patients. Additionally, the cortisol level decreased by approximately 1.69.

Table 6. Comparison of salivary cortisol levels in the intervention and control groups

Variable	Mean±SD Intervention group			Mean±SD Control group		
	Pre	Post	*p*	Pre	Post	*p*
Salivary cortisol	6.221±3.242	4.531±2.584	0.000	6.136±3.666	6.169±3.424	0.731

4. Discussion

The purpose of this study was to identify the effectiveness of "EDUDARA" self-management training on psychological well-being, which is also associated with cortisol levels. The results showed that this intervention is more effective in increasing the psychological well-being among breast cancer patients compared to the standard education. It is more holistic, not only providing information about the disease and therapy but also individual training about disease, therapy, symptom management, side effects of therapy, and training to manage emotions and uncertainty.

The results of this study showed that the intervention and control groups at the pre-test had an average score of psychological well-being of 83.89 and 80.46, respectively. The average post-test psychological well-being score in the intervention group increased more than in the control group. Indicators of psychological well-being, namely self-acceptance, autonomy, environmental mastery, relationships with other people, and personal growth, increased significantly before and after self-management training in the intervention group, while in the control group, only the indicators of environmental mastery, personal growth, and life goals increased. The intervention group experienced higher scores in all indicators of psychological well-being compared to the control group. This is similar with other research by Gilbertson et al. (2019), which stated that educational interventions lead to increased knowledge only. Self-management is the emotional process of actively expressing feelings, which provides an increased assessment of the health status and adaptation of breast cancer patients (Avila et al., 2015). Therefore, self-management, including emotional aspects, is very important in the adaptation of breast cancer patients.

This study showed that after implementing self-management using EDUDARA, all indicators of psychological well-being showed a significant increase. This result is in line with other research that showed providing training in managing emotions in cancer patients through a self-regulation program increased positive perceptions of pain and patient enthusiasm, leading to more positive well-being (Iddon et al., 2019). Self-management means that patients can adjust their behavior to be able to achieve life goals, achieve satisfaction and well-being, and they can control stressful situations. Generally, chronic stress experienced by breast cancer patients decreases psychological well-being because patients are unable to perform self-management properly (Larasati et al., 2020).

The COVID-19 pandemic has brought many changes to human life, including chemotherapy services at hospitals in the city where this study took place There were health protocols in place to prevent the COVID-19 virus from spreading to patients and health workers, such as changing the number of service capacities for patients receiving chemotherapy on a daily basis and limiting patient-health worker interaction. These situations were comparable in Rome, Italy, demonstrating that the COVID-19 epidemic had affected the distribution of medical resources, causing growing fear among patients, particularly about treatment, and creating anxiety issues associated to COVID-19 (Vanni et al., 2020). These conditions also cause stress for patients, so they must be able to actively gain information and skills to manage the effects of negative emotions on the body. Through EDUDARA intervention, the patients were given education and training in managing their emotions by recognizing their own emotions, recognizing the emotions of others, conveying emotions to others, and being taught about being grateful in life every day. Patients learned to think positively in life by taking the meaning of life more positively. Additionally, patients were trained to do deep breathing relaxation for at least two weeks every morning and evening, accompanied by positive affirmations. The results of this study were similar to the results of other studies which stated that the self-management behavior of breast cancer patients with educational strategies was effective in reducing the distress of cancer patients (Younis et al., 2021; Mohammadzadeh et al., 2022). Furthermore, patient's self-management training on the emotional aspect through relaxed breathing with full awareness, which involves meaning and attention in the patient's daily life, has been shown to be effective in reducing depression and improving well-being after intervention (Durosini et al., 2022; Nihayati et al., 2021).

The relationship between psychological aspects and cortisol levels involves the concept of psychoneuroimmunology, which is the study of the interaction between behavior, neuroendocrine, and the immune system (Chen et al., 2023). It is also in accordance with the process of pain management (Pugh et al., 2021). The breast cancer journey and therapy that patients undergo have an impact on the patient's physical, emotional, and psychological symptoms (Badana et al., 2019; Pace et al., 2021). The results of this study showed that self-management training is significant in decreasing salivary cortisol in the intervention group. This is similar with other research reporting that education and training relaxation programs as self-management, including pain management, significantly decreased cortisol in patients with stage 0- stage 3 cancer without metastasis (Alhazmi et al., 2021). Breathing relaxation exercises help improve the patient's ability to reduce tension and increase the patient's ability to relax, thus decreasing stress and blocking cortisol through the HPA axis system (Ramírez-Expósito et al., 2021; Soetrisno et al., 2020). One sign of endocrine dysregulation regarding distress is a disruption in the circadian cortisol rhythm (Herrera et al., 2022; Ramírez-Expósito et al., 2021). Relaxation exercises, positive thinking in interpreting life, recognizing one's emotions, and increasing positive perceptions about breast cancer give auditory-visual and somatosensory stimuli that will be forwarded to the limbic system and the lateral Bed Nucleus of the Striae Terminalis (BNST), which is the main effector of the emotional response structure. From the BNST, it is passed to the paraventricular nucleus (PVN), which will inhibit the HPA axis so that cortisol levels decrease. Cortisol is a hormone produced in response to physical and psychological stress in humans, which is related to the stress and anxiety response of breast cancer patients (Endang et al., 2019; de la Torre-Luque et al., 2020). Providing self-management training increases cognitive structuring abilities and more positive illness perception, which has an impact on reducing stress hormones (Endang et al., 2019).

5. Implications and limitations

The findings of this study hold practical implications for nurses as professional healthcare practitioners seeking to increase psychological well-being in breast cancer patients. Nurses can utilize the "EDUDARA" online self-management intervention system as a guide for mental nursing care, offering psychological support to breast cancer patients. To effectively improve patients' psychological well-being and reduce cortisol levels, nurses must provide interventions that extend beyond disease education, encompassing emotional support, psychological guidance, and stress management skills.

However, it is important to note that this study has limitations. It overlooked treatments that patients had already undergone, such as mastectomy and radiotherapy, which could significantly influence their psychological well-being. Additionally, the sample was collected from a single study center and may not fully represent the broader population of interest.

6. Conclusion

This study shows a significant effect of providing self-management training through the EDUDARA intervention on increasing the psychological well-being and significantly reducing cortisol levels in breast cancer patients. Therefore, it is important for nurses to improve psychological well-being by providing education and skill training in self-management. This study suggests that nurses should be aware of the psychological distress, emotions, and uncertainty responses experienced by breast cancer patients, which can impact their psychological well-being. Negative psychological well-being is correlated with excessive stress hormone cortisols, which can certainly affect the patient's health. Therefore, breast cancer patients should be given self-management support in managing the disease, therapy side effects, and also stress. The results of this study are limited in their ability to explain the medical therapy factors that need to be considered in developing psychological well-being and cortisol levels. Thus, future research should focus more on investigating these aspects.

Acknowledgment

We would like to thank to the Nursing Department and BPPM of the Faculty of Health Sciences, Universitas Brawijaya, for financial support through BNPB FIKES funding. We would also like to extend our thanks to the panel experts from both the Department of Oncology Surgery and the Department of Anaesthesiology and Intensive Therapy, particularly Dr. Sidho Hantoko, Sp.B(K)Onk, for their assistance and significant contributions to this research.

Author contribution

LS communicated the research concept. Subsequently, LS, RN, A, and MR engaged in preliminary deliberations concerning research proposals and methodological design. LS, NH, and IAR were involved in the draft and revised manuscript, which were supervised by LS. The writing and review process of the manuscript was jointly accomplished by all authors. All authors have contributed equally to this manuscript without exception, regardless of their respective roles.

Conflict of interest

We declare that there is no potential conflict of interest concerning this research, authorship, and/or publications of this article.

References

Ahmadzadeh, I., Abdekhoda, M., & Bejani, M. (2021). Improving self-care management in patients with breast cancer through health literacy promotion. *Ethiopian Journal of Health Sciences, 31*(1), 85–90. https://doi.org/10.4314/ejhs.v31i1.10

Alhazmi, L. S. S., Bawadood, M. A. A., Aljohani, A. M. S., Alzahrani, A. A. R., Moshref, L., Trabulsi, N., & Moshref, R. (2021). Pain management in breast cancer patients: A multidisciplinary approach. *Cureus*, *13*(6). https://doi.org/10.7759/cureus.15994

Arambasic, J., Sherman, K. A., & Elder, E. (2019). Attachment styles, self-compassion, and psychological adjustment in long-term breast cancer survivors. *Psycho-Oncology*, *28*(5), 1134–1141. https://doi.org/10.1002/pon.5068

Badana, A. N. S., Marino, V. R., Templeman, M. E., Mcmillan, S. C., Tofthagen, C. S., Small, B. J., & Haley, W. E. (2019). Understanding the roles of patient symptoms and subjective appraisals in well-being among breast cancer patients. *Support Care Cancer, 27*(11), 4245-4252. https:doi.org/10.1007/s00520-019-04707-2.

Bò, M. C., Merlo, A., Ligabue, M. B., Bassi, M. C., Lusuardi, M., & Campanini, I. (2023). Self-managed physical activity in breast cancer survivors: A scoping review. *PLoS ONE*, *18*(4), e0284807. https://doi.org/10.1371/journal.pone.0284807

Bray, F., Ferlay, J., Soerjomataram, I., Siegel, R. L., Torre, L. A., & Jemal, A. (2018). Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, *68*(6), 394–424. https://doi.org/10.3322/caac.21492

Chen, X., Wang, M., Yu, K., Xu, S., Qiu, P., Lyu, Z., Zhang, X., & Xu, Y. (2023). Chronic stress-induced immune dysregulation in breast cancer: Implications of psychosocial factors. *Journal of Translational Internal Medicine*, *11*(3), 226–233. https://doi.org/10.2478/jtim-2021-0050

de la Torre-Luque, A., Cerezo, M. V., López, E., & Sibole, J. V. (2020). Emotional distress among long-term breast cancer survivors: The role of insomnia and worry. *Behavioral Psychology/ Psicologia Conductual*, *28*(3), 533–549.

Durosini, I., Triberti, S., Savioni, L., Sebri, V., & Pravettoni, G. (2022). The Role of emotion-related abilities in the quality of life of breast cancer survivors: A Systematic review. *International Journal of Environmental Research and Public Health*, *19*(19), 12704. https://doi.org/10.3390/ijerph191912704

Endang, N. H, Nursalam, N., Chong, M. C., Taat, P. S, & Hidayat, A. (2019). Change of stress and cortisol levels in patients with breast cancer given psychospiritual care. *International Journal of Caring Sciences*, *12*(3), 1796–1805.

Frausto, V. M. R., Ortega, L. C., Chiapas, J. M. R., González, M. A. H., Sabanero, G. B., & Rocha, G. M. (2020). Correlation between stress, cortisol levels and coping strategies in cancer patients undergoing treatment. *Enfermeria Global, 19*(4), *196–219*. https://doi.org/10.6018/eglobal.410951

Guan W, Liang W, Zhao Y, Liang H, Chen Z, Li Y, Liu X, Chen R, Guan, W. J., Liang, W. H., Zhao, Y., Liang, H. R., Chen, Z. Z. S., Li, Y. M., Liu, X. Q., Chen, R. C., Tang, C. L., Wang, T., Ou, C. Q., ... Chen R. (2020). Comorbidity and its impact on 1590 patients with COVID-19 in China: A nationwide analysis. *The European Respiratory Journal,* 55(5), 2000547. https://doi.org/10.1183/13993003.00547-2020

Hernandez, R., Bassett, S. M., Boughton, S. W., Schuette, S. A., Shiu, E. W., & Moskowitz, J. T. Psychological well-being and physical health: Associations, mechanisms, and future directions. *Emotion Review, 10*(1), 18-29. https://doi.org/10.1177/1754073917697824

Herrera, R. A., Deshpande, K., Martirosian, V., Saatian, B., Julian, A., Eisenbarth, R., Das, D., Iyer, M., & Neman, J. (2022). Cortisol promotes breast-to-brain metastasis through the blood-cerebrospinal fluid barrier. *Cancer Reports*, *5*(4), 1–11. https://doi.org/10.1002/cnr2.1351

Iddon, J. E., Taylor, P. J., Unwin, J., & Dickson, J. M. (2019). The role of positive goal engagement in increased mental well-being among individuals with chronic non-cancer pain. *British Journal of Pain*, *13*(4), 230-238. https://doi.org/10.1177/2049463718824857

Koinig, K. A., Arnold, C., Lehmann, J., Giesinger, J., Köck, S., Willenbacher, W., Weger, R., Holzner, B., Ganswindt, U., Wolf, D., & Stauder, R. (2021). The cancer patient's perspective of COVID-19-induced distress—A cross-sectional study and a longitudinal comparison of HRQOL assessed before and during the pandemic. *Cancer Medicine*, *10*(12), 3928–3937.

https://doi.org/10.1002/cam4.3950

Kong, H., Liu, Y., Wu, K., Cui, S., Bai, J., & Fan, X. (2022). Pain and self-management status among Chinese patients with cancer during the COVID-19 pandemic. *Pain Management Nursing*, *23*(1), 26–30. https://doi.org/10.1016/j.pmn.2021.09.004

Lally, R. M., Bellavia, G., Gallo, S., Kupzyk, K., Helgeson, V., Brooks, C., Erwin, D., & Brown, J. (2019). Feasibility and acceptance of the CaringGuidance web-based, distress self-management, psychoeducational program initiated within 12 weeks of breast cancer diagnosis. *Psycho-Oncology*, *28*(4), 888–895. https://doi.org/10.1002/pon.5038

Larasati, D., A., Nugroho, F. A., & Marlina, T. M. (2020). Self care management activities untuk meningkatkan psychological serenity pasien kanker [Self care management activities to increase psychological serenity in cancer patients]. *Jurnal Keperawatan Jiwa*, *8*(3), 337–352.

Luo, X., Chen, Y., Chen, J., Zhang, Y., Li, M., Xiong, C., & Yan, J. (2022). Effectiveness of mobile health-based self-management interventions in breast cancer patients: A meta-analysis. *Supportive Care in Cancer*, *30*(3), 2853–2876. https://doi.org/10.1007/s00520-021-06568-0

Maculaitis, M. C., Liu, X., Berk, A., Massa, A., Weiss, M. C., Kurosky, S. K., Li, B., & McRoy, L. (2023). Psychosocial wellbeing among patients with breast cancer during COVID-19. *Current Oncology*, *30*(4), 3886–3900. https://doi.org/10.3390/curroncol30040294

Mahendradhata, Y., Lestari, T., & Djalante, R. (2022). Strengthening government's response to COVID-19 in Indonesia: A modified Delphi study of medical and health academics. *PLoS ONE*, *17*(9), e0275153. https://doi.org/10.1371/journal.pone.0275153

McBride, E., Arden, M. A., Chater, A., & Chilcot, J. (2021). The impact of COVID-19 on health behaviour, well-being, and long-term physical health. *British Journal of Health Psychology*, *26*(2), 259–270. https://doi.org/10.1111/bjhp.12520

Mészáros-Crow, E., López-Gigosos, R., Mariscal-López, E., Agredano-Sanchez, M., García-Casares, N., Mariscal, A., & Gutiérrez-Bedmar, M. (2023). Psychosocial interventions reduce cortisol in breast cancer patients: Systematic review and meta-analysis. *Frontiers in Psychology*, *14*, 1148805. https://doi.org/10.3389/fpsyg.2023.1148805

Ministry of Health Republic of Indonesia. (2023). *Perkembangan situasi penyakit infeksi emerging minggu epidemiologi ke-17 tahun 2023 (23-29 April 2023) [Development of the emerging infectious disease situation 17th epidemiological week 2023 23-29 April 2023].* Ministry of Health Republic of Indonesia. https://infeksiemerging.kemkes.go.id/document/download/LQv

Mohammadzadeh, Z., Eghtedar, S., Ayatollahi, H., & Jebraeily, M. (2022). Effectiveness of a self-management mobile app on the quality of life of women with breast cancer: A study in a developing country. *BMC Women's Health*, *22*(1), 1–12. https://doi.org/10.1186/s12905-022-02020-5

Muttaqin, D. (2022). Internal structure evaluation on the Indonesian version of psychological well-being scales. *Psympathic: Jurnal Ilmiah Psikologi,* *9*(1), 1–16. https://doi.org/10.15575/psy.v9i1.10710

Nihayati, H. E., Nurhanifah, L., & Krisnana, I. (2021). The effect of psychoeducation on self-efficacy and motivation for taking treatment in breast cancer patients (Ca Mammae). *Jurnal Ners*, *16*(1), 96–100. https://doi.org/10.20473/jn.v16i1.22560

Novarisa, N., Helda, H., & Mulyadi, R. (2023). Indonesia's COVID-19 trend after the end of a public health emergency of international concern: Preparation for an endemic. *Kesmas: Jurnal Kesehatan Masyarakat Nasional*, *18*(1), 25-30. https://doi.org/10.21109/kesmas.v18isp1.7018

Ortega, L. C., Alicia, M., González, H., & Sabanero, G. B. (2020). Correlation between stress, cortisol levels and coping strategies in cancer patients undergoing treatment. *Enfermeria Global*. 208–219. https://doi.org/10.6018/eglobal.410951

Pace, T. W. W., Badger, T. A., Segrin, C., Sikorskii, A., & Crane, T. E. (2021). The relationship between health-related quality of life and saliva C-reactive protein and diurnal cortisol rhythm in Latina breast cancer survivors and their informal caregivers: A pilot study. *Journal of Transcultural Nursing*, *32*(4), 326–335. https://doi.org/10.1177/1043659620926537

Pugh, T. M., Squarize, F., & Kiser, A. L. (2021). A comprehensive strategy to pain management for cancer patients in an inpatient rehabilitation facility. *Frontiers in Pain Research*, *2,* 688511. https://doi.org/10.3389/fpain.2021.688511

Ramírez-Expósito, M. J., Dueñas-Rodríguez, B., Carrera-González, M. P., Navarro-Cecilia, J., & Martínez-Martos, J. M. (2021). Circulating levels of β-endorphin and cortisol in breast cancer. *Comprehensive Psychoneuroendocrinology, 5,* 100028. https://doi.org/10.1016/j.cpnec.2021.100028

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069. https://psycnet.apa.org/doi/10.1037/0022-3514.57.6.1069

Sephton, S. E., Lush, E., Dedert, E. A., Floyd, A. R., Rebholz, W. N., Dhabhar, F. S., Spiegel, D., & Salmon, P. (2013). Diurnal cortisol rhythm as a predictor of lung cancer survival. *Brain, Behavior, and Immunity*, *30,* S163-S170. https://doi.org/10.1016/j.bbi.2012.07.019

Smith, A. "Ben," Bamgboje-Ayodele, A., Butow, P., Klein, B., Turner, J., Sharpe, L., Fardell, J., Beatty, L., Pearce, A., Thewes, B., Beith, J., & Girgis, A. (2020). Development and usability evaluation of an online self-management intervention for fear of cancer recurrence (iConquerFear). *Psycho-Oncology*, *29*(1), 98–106. https://doi.org/10.1002/pon.5218

Soetrisno, Cahyanto, E. B., Mulyani, S., Nugraheni, A., Nurinasari, H., & Tjiang, R. E. (2020). The cortisol level, depression anxiety stress score, and quality of life in patient with advance stage cervical cancer after two years of psychorative intervention. *Bali Medical Journal*, *9*(1), 6–12. https://doi.org/10.15562/bmj.v9i1.1636

Supriati, L., Sudiana, I. K., Nihayati, H. E., Ahsan, Rodli, M., & Kapti, R. E. (2022). Perspective of uncertainty and emotional responses in breast cancer patients during the COVID-19 pandemic. *SAGE Open Nursing*, *8,* 1-7. https://doi.org/10.1177/23779608221124294

Supriati, L., Sudiana, I. K., Nihayati, H. E., Ahsan, Rodli, M., & Kapti, R. E. (2023). Patient and illness factors influencing fear of recurrence in breast cancer women. *Journal of the Pakistan Medical Association*, *73*(2), S26–S29. https://doi.org/10.47391/JPMA.Ind-S2-6

Surendra, H., Paramita, D., Arista, N. N., Putri, A. I., Siregar, A. A., Puspaningrum, E., Rosylin, L., Gardera, D., Girianna, M., & Elyazar, I. R. (2023). Geographical variations and district-level factors associated with COVID-19 mortality in Indonesia: a nationwide ecological study. BMC Public Health, 23(1), 103. https://doi.org/10.1186%2Fs12889-023-15015-0

Vanni, G., Materazzo, M., Pellicciaro, M., Ingallinella, S., Rho, M., Santori, F., Cotesta, M., Caspi, J., Makarova, A., Pistolese, C. A., & Buonomo, O. C. (2020). Breast cancer and COVID - 19: The effect of fear on patients' decision-making process. *In Vivo*, *34*, 1651–1659. https://doi.org/10.21873/invivo.11957

Verma, R., Kilgour, H. M., & Haase, K. R. (2022). The psychosocial impact of COVID-19 on older adults with cancer: A rapid review. *Current Oncology*, *29*(2), 589–601. https://doi.org/10.3390/curroncol29020053

Viale, G., Licata, L., Sica, L., Zambelli, S., Zucchinelli, P., Rognone, A., Aldrighetti, D., Di Micco, R., Zuber, V., Pasetti, M., Di Muzio, N., Rodighiero, M., Panizza, P., Sassi, I., Petrella, G., Cascinu, S., Gentilini, O. D., & Bianchini, G. (2020). Personalized risk–benefit ratio adaptation of breast cancer care at the epicenter of COVID-19 outbreak. *The Oncologist*, *25*(7), e1013–e1020. https://doi.org/10.1634/theoncologist.2020-0316

Villarosa, J., & Ganotice, F. (2018). Construct validation of Ryff's Psychological Well-being Scale: Evidence from Filipino teachers in the Philippines. *Philippine Journal of Psychology, 51*(1), 1–20. https://doi.org/10.31710/pjp/0051.01.01

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):110-124, April 2024
https://doi.org/10.14710/nmjn.v14i1.61605

ORIGINAL RESEARCH

Distress and Coping Strategy among Indonesian Men with Type-2 Diabetes Mellitus

Fajar Ari Nugroho[1], Rico Budhiarta Chandra[1], Nike Laila[1], Sera Rukia[1], Inggita Kusumastuty[1], Anggun Rindang Cempaka[1], Lola Ayu Istifiani[1], Atifa Nafia Hasantie Latif[1]

[1]*Department of Nutrition, Faculty of Health Sciences, Universitas Brawijaya, Malang, East Java, Indonesia*

Article Info

Article History:
Received: 19 January 2024
Revised: 18 April 2024
Accepted: 24 April 2024
Online: 30 April 2024

Keywords:
Coping; diabetes mellitus;
men; stress

Corresponding Author:
Fajar Ari Nugroho
Department of Nutrition, Faculty of Health Sciences, Universitas Brawijaya, Malang, East Java, Indonesia
Email:
fajar_arinugroho.fk@ub.ac.id

Abstract

Background: Type-2 diabetes mellitus (T2DM) can have a notable impact on the psychological and physical well-being of individuals, which in turn affects the management of the condition. Men and women experiencing stress and adopting distinct coping strategies. However, research focusing specifically on T2DM in men is still limited.
Purpose: The present study intends to investigate the distress and coping strategies adopted by male T2DM outpatients in Malang, East Java, Indonesia.
Methods: This study employed a qualitative research design and conducted in-depth interviews to 24 male T2DM outpatients. The interview guidelines were formulated using the Indonesian version of the Diabetes Distress Scale (DDS17) questionnaire, which comprised four domains: physician-related distress, emotional burden, regimen-related distress, and interpersonal distress. A thematic analysis was performed to analyze the results gathered during the research and compile them into a final report.
Results: The study revealed that individuals diagnosed with T2DM experienced a range of emotional and practical difficulties, including feelings of fear, anxiety, and a lack of understanding. Disease burden, a lack of understanding of both diabetes and healthcare services, difficulties managing their diet, routine medication, financial concerns, and fatigue also contributed to the distress. To cope with distress, the informants identified eight distinct coping strategies. Of these, the most effective strategy was receiving support from family members, followed by acceptance, self management, positive attitude, understanding of their illness, joining the diabetes community, spirituality, and getting more information about T2DM.
Conclusion: The findings of this study indicated that men experience eight distinct types of stress and utilise comparable coping strategies associated with T2DM. Emotional distress represents the predominant pressure, while family support constitutes the primary coping strategy. These results are important for nurses and other healthcare professionals in supporting patients.

How to cite: Nugroho, F. A., Chandra, R. B., Laila, N., Rukia, S., Kusumastuty, I., Cempaka, A. R., Istifiani, L. A., & Latif, A. N. H. (2024). Distress and coping strategy among Indonesian men with type-2 diabetes mellitus. *Nurse Media Journal of Nursing, 14*(1), 110-124. https://doi.org/10.14710/nmjn.v14i1.61605

1. Introduction

According to the World Health Organization, diabetes mellitus (DM) is a chronic metabolic disease characterised by impaired metabolism of carbohydrates, lipids, and proteins due to insulin deficiency. DM can increase the risk of various diseases, including cardiovascular diseases, neuropathy, obesity, liver diseases, and others (WHO, 2020). In Southeast Asia, Indonesia is positioned among the countries with the highest prevalence of DM cases accounting for 11.3% cases (Kurtanty et al., 2023). According to the National Report of Riskesdas 2018, the prevalence of DM in Indonesia increased by 1.5% in 2013 and by an additional 2% in 2018 (Riskesdas, 2019). The prevalence of DM in Indonesia, particularly in East Java, is among the five highest with a rate of 2.6%. It is also noteworthy that DM is more prevalent among women, with a prevalence of 1.78%, compared to men with a prevalence of 1.21% (Riskesdas, 2019). Riskesdas (2019) reports that Surabaya (4.43%) and Malang (2.88%) have the highest prevalence of DM in East Java.

Diabetes mellitus (DM) could potentially have a valuable adverse impact on the psychosocial adjustment and physical well-being of patients due to the complex nature of managing the condition (Younis et al., 2017). Moreover, DM may negatively affect the physical and psychological health of diabetic patients, leading to a decline in their quality of life (Bak et al., 2018; Surjoseto & Sofyanty, 2022). Hence, there is an association between coping strategies and the quality of life of individuals with DM. Individuals with diabetes may experience stress if their coping strategies are not utilised correctly. Psychological stress can also have a direct impact on glycaemic control, resulting in elevated levels of glucose in the bloodstream. These stress conditions lead to changes within the body that react to glucose (Dewi et al., 2021). Moreover, gender differences may affect the severity of type 2 diabetes mellitus (T2DM), including hormonal and dietary obedience. Another study indicated that men with diabetes mellitus typically exhibit lower compliance in adhering to the prescribed dietary regimen than their female counterparts (Kusumawati, 2015). However, it was reported in another study that genders possess distinct abilities to adapt and comply (Mathew et al., 2012).

Coping stress strategies techniques are methods used to adjust to stress, address issues, and adapt to change. Coping stress strategies aim to regulate the internal and external needs of individuals, including physiological, psychological, developmental, maturational, environmental, cultural, and religious factors, in response to conditions that threaten their psychological well-being (Surjoseto & Sofyanty, 2022). These mechanisms, when employed, have the potential to enhance the patient's quality of life (Bilsker et al., 2018; Setyoadi et al., 2023). They can mitigate stress, preserve positive social relationships, and cultivate a positive self-concept (Dewi et al., 2021).

The stress conditions experienced by patients with DM vary greatly from person to person, necessitating the development of coping stress strategies (Surjoseto & Sofyanty, 2022). A previous study found that women had a 2.7 times higher likelihood of experiencing stress compared to men (Kountul et al., 2018). This may be attributed to women using their emotions while men tend to exhibit a calmer and more rational approach when encountering difficulties. However, research studies on coping strategies in men with DM are still limited at present. Men often handle their problems privately and seek practical solutions (Adasi et al., 2020; Ziabari & Treur, 2018). They typically avoid stress management techniques that focus on emotions (Situngkir, 2018). Men typically cope with the process of avoiding, dulling, distracting, adapting, and engaging in new activities (Wilson et al., 2022). Therefore, this study was conducted to investigate distress and coping strategies in male DM patients.

2. Methods

2.1 Research design

This qualitative study employed a phenomenological approach and sought to elucidate the nature of diabetes-related distress and associated coping strategies among men diagnosed with T2DM.

2.2 Setting and participants

The research study was carried out from April to June 2023, employing a purposive sampling method for participants' recruitment. The selected purposive sampling approach aligned with the research methodology, aims and objectives, thus addressing each aspect of accuracy (Campbell et al., 2020). Inclusion criteria of this study were males over 18 years of age with type-2 diabetes, and residing in the Malang Raya region (Malang City and Malang District).

The recruitment of participants was conducted via social media (Facebook and Instagram) and in collaboration with private clinics. Each prospective participant was provided with a comprehensive, written explanation of the research project, delivered in a direct and transparent manner according to the convenience of the individual. Should the informant express interest, they were asked to sign an informed consent form, following which a time was set for the interview, which would either be conducted in-person or via a video conference, depending on the preferences of the individual.

The 24 of participants who were involved in the final phase of research represented an in-depth exploration of the variations in opinion that continued to be identified in relation to the four question domains. Researchers observed that dominant opinions in a given domain achieved saturation point more quickly and needed fewer participants to confirm this. Meanwhile, opinions that were not common or unique required a larger number of participants to achieve the same level of saturation. No exclusion criteria were used to select the informants involved in this study.

2.3 Data collection

The questions used in the interview were derived from the DDS 17 questionnaire (Fukuda et al., 2019). Specifically, they were taken from the DDS 17 Indonesian version which had already been employed in previous research (Arifin et al., 2020). The questions from the Indonesian version of DDS17 were subsequently adopted as an interview guideline. All questions were posed as an initial probing, the purpose of which was to explore the informant's experiences with the objective of developing a detailed picture across several domains. In particular, this included physician-related distress, emotional distress, regimen-related distress, and interpersonal distress as presented in Table 1.

Table 1. Interview questions guidelines

Domain		Interview Questions
Physician-Related Distress	1.	Do you feel that your doctor does not understand enough about DM and its treatment?
	2.	Do you feel that your doctor does not give you clear instructions on how to manage your multiple sclerosis (DM)?
	3.	Do you have the feeling that your doctor doesn't take your concerns seriously?
	4.	Do you have the feeling that you don't have a doctor you can see regularly for advice about your DM?
Emotional Distress	5.	Is there a feeling that diabetes is too much of a drain on your energy, both mentally and physically?
	6.	Do you have feelings of anger, anxiety and/or depression when you think about living with type 2 diabetes?
	7.	Do you have the feeling that diabetes is in control of your life?
	8.	Do you feel that no matter what you do, you will end up with long term complications?
	9.	Do you feel overwhelmed by the demands of living with DM?
Regimen-Related Distress	10.	Do you feel that you are not measuring your blood glucose on a regular basis?
	11.	Do you have the feeling that you often fail in your diabetes care routine?
	12.	Do you have feelings of insecurity about your ability to control your blood glucose every day?
	13.	Do you have the feeling that you are not following a proper plan for your diet?
	14.	Do you have a feeling of lack of motivation to continue with the management of your DMs on your own?
Interpersonal Distress	15.	Do you have the feeling that your friends and family are not supportive enough of your condition?
	16.	Do you have the feeling that your friends and family don't understand the difficulties you face in living with DM?
	17.	Do you feel that your friends and family do not give you the emotional support that you would like them to?

Data were collected through in-depth interviews using the tools mentioned earlier. The following are illustrative examples of questions pertaining to the physician-related distress: "Do you perceive that your doctor lacks sufficient understanding about DM and its treatment?"; emotional distress: "Do you feel that diabetes consumes a significant amount of your mental and physical resources?"; regimen-related distress: "Do you experience a lack of motivation to continue self-managing your DM?"; and finally, interpersonal distress: "Do you feel that your friends and family do not appreciate your difficulties living with DM?."

In this study, in-depth interviews were conducted with each participant using the provided interview guideline, and each interview lasted approximately 45-60 minutes. The research team (RBC, NL, and SR), working in pair, conducted semi-structured in-depth interviews with the participants. One investigator served as the primary interviewer, while the other served as an observer. Interviews were conducted with each participant on a single occasion, as part of the research process. The full range of information, opinion, non-verbal communication, vocal inflection, and facial expressions expressed by each individual was documented, including those conveyed via Zoom. For instances where the interviews were conducted via Zoom, the process was recorded through the Zoom recorder and notes, while in the case of live interviews, the process was captured on audio and notes.

2.4 Data analysis

The Colaizzi approach, which was first identified in 1978, was employed to analyse data thematically. The Colaizzi approach represents a robust and rigorous methodology for analysing informants' experiences with the objective of guaranteeing the credibility and reliability of the outcomes of qualitative research (Wirihana et al., 2018). The collected and extracted data were then subjected to further analysis to produce significant findings, grouped according to pre-selected themes in order to address the stated research objectives in a meaningful way. Furthermore, the resulting themes were then subjected to a detailed examination and verification process, in which statements from participants were taken into account in order to gain a more comprehensive understanding. The final results obtained were thus a set of organised themes which encapsulated the phenomena described by participants in terms of distress and coping strategies.

As an illustrative example, the responses to the open questions in the emotional distress domain, which asked about feelings of anger, fear and/or depression when living with DM, indicated that the participants only experienced distress at the beginning of the diagnosis. With family support, however, they were able to understand the condition and therefore the distress was no longer experienced. This leads to two conclusions, namely that distress can be a consequence of emotional burden and that family support can serve as a coping strategy. A similar process was then applied to the other domains, leading to the finalisation of eight themes representing distress experiences and eight themes representing coping strategies.

2.5 Trustworthiness/rigor

To ensure the integrity and credibility of the research process, the researchers (FAN, RBC, NL, SR, IK, ARC, LAI and ANLH) responsible for each stage of data collection, extraction, analysis, and theme development ensured that the appropriate methodology was applied and that the results submitted for review were accurately and clearly represented. These results were reviewed by all research team members in regularly scheduled meetings every two weeks, ensuring transparency, accountability, and alignment with established research procedures. Following the transcription of the interviews, the results were read by all researchers and re-read to ensure comprehension and accuracy. Thereafter, the key statements obtained from the informants were re-checked for suitability in answering the qualitative research questions initially posed. The statements were subsequently organised and summarised into themes, which were then presented to the participants to ascertain their confirmation. This process of ensuring dependability and confirmability represents a fundamental aspect of this research. The entire data-gathering process made use of a predefined question guide (DDS 17 Indonesian version), the efficacy of which had previously been demonstrated by the results of published studies. This ensured the transferability of the research and provided an excellent foundation for further replication or utilisation in subsequent studies.

2.6 Ethical considerations

The collection of data commenced once ethical approval had been granted by the Health Research Ethics Committee of the Faculty of Health Sciences at Universitas Brawijaya, with reference number of 1127/UN10.F17.10.4/TU/2023. Participants were contacted based on predetermined criteria and provided with a clear explanation of the study's objectives. Therefore, upon obtaining consent from the participant, information regarding the research was provided, including the objectives, procedures, potential discomfort, risks, benefits, and expectations. The recorded data was securely saved in a password-protected root directory using Microsoft Word, with anonymisation and pseudonymisation applied. The folders were kept secure, and anonymity ensured informants could not be linked to their respective stories. Researchers had exclusive access to the data collected through this study.

3. Results

3.1 Characteristics of the participants

The study comprised 24 married men, aged between 23 and 79 years old, with the highest percentage (54%) falling within the age bracket below 53 years (Table 2). Of these participants, 75% of the participants were active employees, while the remaining participants were retirees. The majority of participants (58%) reported completing their most recent education at primary and secondary school level. A total of 13 (54%) out of 24 informants reported that they had been diagnosed with type-2 diabetes mellitus for more than five years.

Table 2. Characteristics of participants (n=24)

Characteristics	f	%
Age (years)		
<53	13	54
≥53	11	46
Education		
Primary-Secondary	14	58
College-Graduate	10	42
Employment		
Active employee	18	75
Retirement	6	25
Diabetes Duration (years)		
≥5	13	54
<5	11	46

Two themes resulted from the analysis were eight sources of distress and eight coping strategies. The sources of distress included emotional burden, disease burden, lack of knowledge, distress concerning healthcare services, distress in managing the diet, distress concerning routine medication, financial concern, and fatigue due to T2DM; while the coping strategies were family support, acceptance, self management, positive attitude, understanding of their illness, joining the diabetes community, spirituality, and getting more information about T2DM.

3.2 Sources of distress

Investigations of participants revealed eight distinct sources of distress. These included a range of emotional and practical difficulties, disease burden, lack of knowledge, distress concerning healthcare services, difficulties managing one's diet, routine medication, financial concerns, and fatigue. Each of these distress factors is explained in further detail below.

3.2.1 Emotional burden

Emotional distress is a state of mental or physical depression, causing a draining of energy, with the felt emotions being typically anger and fear. Overall, all the participants diagnosed with T2DM encountered psychological distress at the beginning, such as feelings of anger and depression. These emotions appeared as they had not been able to accept their diabetes diagnosis. Meanwhile, concerns about the prospect of living with diabetes mellitus could lead to depressive symptoms. However, for the majority of participants, these emotions were not present during the interview. Participants revealed, "In the beginning, I felt angry and depressed when I found out that I had diabetes mellitus, but now I don't feel that way anymore and I feel normal …" (P-21), and "… For the first 1-2 months of being diagnosed with diabetes, I still felt stress, however, for now, I don't feel that stress" (P-24).

Nevertheless, there were individuals who continued to suffer from psychological distress at present at the time of conducting the interview. The participants still experienced worry and anxiety with regards to living with diabetes, which was a notable burden for them. Some of them also struggled with controlling their blood glucose and making necessary lifestyle modifications. This was stated by P-14, "The side effects that I feel from suffering from diabetes mellitus are being confused, traumatized, and also afraid …" and P16: "… I sometimes think about it, I think about how to deal with diabetes mellitus, I also feel sad because DM is a lifelong disease. I'm afraid complications occur. DM also changed my lifestyle."

3.2.2 Disease burden

The symptoms of disease burden experienced by the participants were varied, encompassing frequent thirst and hunger, disrupted sleep, loss of weight, and even amputation. Almost all participants experienced stress due to these symptoms. Symptoms of diabetes occurred when participants were tardy in taking medication or seeking medical attention. Additionally, disrupted sleep was an experiencing symptom, triggered by the need to urinate during the night. This in turn caused fatigue and hindered daily activities, as stated by P-5, "... When my blood sugar content rises, I can't sleep comfortably because I frequently get out of bed to take a pee. This makes me feel tired the next day."

3.2.3 Lack of knowledge

The study findings indicated a widespread lack of knowledge among informants regarding the diabetes self-management of diabetes, particularly pertaining to diet and medication. Several participants had expressed concerns that the regular use of diabetes medication might potentially cause harm to other organs within the body, as stated by P-4, " ... I used to think that the medicine I drank could reduce my blood sugar content, however, it would be problematic for my other body organs"

Several participants reported following advice from a T2DM group, despite the lack of scientific evidence supporting their claims. Contradictory advice, such as the recommendation to avoid vegetables and prioritize egg consumption, was reported by multiple participants as stated by for example by P-18:

> *... I've stopped consuming carbohydrates, now I consume 5-6 boiled eggs for lunch and dinner each. I also eat fish meat, chicken innards, chicken and cow meat, and seafood such as shrimp, clam, etc for my source of protein. I also stopped consuming vegetables and only ate varieties of mushrooms ...* (P-18)

In addition, the majority of participants did not have a comprehensive understanding of T2DM management. This problem led participants to reach a conclusion that was not based on scientific evidence. One of the informants stated that he was doing intermittent fasting as a way of resting the pancreas organ as said by P-24, "I think that the key to dealing with DM is to consume low carbohydrate and intermittent fasting. Intermittent fasting's function is to rest the pancreas ..."

3.2.4 Distress concerning healthcare services

Several participants stated that the service provided by the medical staff was still inadequate. They said that the duration of the consultation was very short because of the long waiting list. While the availability of the chronic disease management program (PROLANIS) in Indonesia provided an avenue for easier access to treatment for patients suffering from diabetes and hypertension, the participants did not confirm this to be the case. This problem led them to believe that junior doctors did not pay enough attention to the growth and education of their illness, as stated by two of the participants, "I think that the doctors didn't pay much attention to each of their patients. So, I reduced my doses of medicine ..." (P-17). " I think that the explanation my doctor gave me is too simple ... while I think I need a more detailed interpretation of my food diet" (P-1).

3.2.5 Distress in managing the diet

Meal planning for people with diabetes was very strict in order to maintain blood sugar levels and required drastic changes to the usual meal plan in a short period of time. These sudden changes could cause feelings of stress. Participants expressed that they had difficulty following the sudden change in meal plan because of the need to calculate the portion for each meal. This was, for example, stated by P-21: "... If I follow the DM's meal plan, I'm the one who is uncomfortable because I need to weigh my food ... I don't feel many changes to my blood sugar content even after doing it for 1 month" (P-21).

In addition, participants found it difficult to stick to a diet when they had a family event or went out to eat. Some participants also found it difficult to decide what to eat. Another barrier felt by informants was having to control themselves to eat carbohydrate-rich foods. This was corroborated by P-8, "I couldn't determine which food to eat because I had to follow the meal plan from my superior ..." and by P-1, "I understand that carbohydrate food sources are not good for my blood sugar, however, I still eat high-carbohydrate snacks or sweet drinks ..."

3.2.6 Distress concering routine medication

People with T2DM had to take medication for life. This routine is seen as a burden by some participants. Neglecting to take medication had often become a source of stress, leading them to feel burdened by the disease. The participants said that not taking their medication happened because they were too tired after daily activities, as said by an informant, "... I often slack on drinking my meds because I wake up late, especially when I feel tired ..." (P-11).

3.2.7 Financial concern

The majority of patients did not experience any financial difficulties with their routine medical check-ups. This was because of the BPJS (Indonesian National Insurance) programme, which was supported by the government to provide free medical check-ups and medicines to the community. However, some participants did not understand the benefits of the BPJS, so they overlooked the routine check-up because of the difficulty in paying the hospital fees themselves. This was revealed by a participant: "I'm a university student and I haven't enrolled in BPJS yet. Furthermore, I felt that checking my blood sugar content with the doctor no longer became my priority because I have more important expenses to cover" (P-1).

3.2.8 Fatigue due to T2DM

Several participants said that they felt tired more easily because of diabetes. This feeling was often experienced before they were diagnosed with T2DM. This was identified by participants when they felt that their work performance was lower than usual, as reported by P-21, "I felt the effect of diabetes mellitus, which is feeling tired when my blood sugar content is under the normal range ...". However, many of the participants felt that T2DM made an important difference in their performance in everyday activities. Participants said that T2DM should not be a barrier to performing at their best in everyday activities, as mentioned by one of participants, "My friends were wondering why even though I had diabetes, I still work with much passion ..." (P-10).

3.3 Coping strategies

The research revealed that individuals with T2DM employed various strategies to cope with their condition. These included receiving support from family members, accepting the condition, self-managing the illness through lifestyle changes and medication adherence, maintaining a positive attitude, seeking out information about the disease and participating in online support groups. Additionally, many participants reported that spiritual solace and a deeper understanding of T2DM contributed to their ability to cope. Details of these findings are presented below in the form of a discussion.

3.3.1 Family support

Family support became one of the methods used by informants to reduce their stress. The participants felt that the family could give them the attention and facilities they needed. Supports from wives, such as reminding them to take their medication and preparing dinner, made the participants felt loved. This was supported by P-14, "My family is very supportive and reminds me about my weight, working out, and consuming medicine ..." and P-9, "My wife always reminds me to drink medicine, she is becoming like a doctor in the house."

This study also found that family became a good motivator for informants to control their blood glucose and take care of their health. Participants said that they had to do this because of their responsibility as the head of the family to support their family. One participant revealed, "... his growth and development and his future depend on my health. It means if I'm not healthy no one can take care of him, no one can pay for his schooling" (P-3).

3.3.2 Acceptance

One solution to prevent stress-related illnesses was accepting the illness. According to the interview, most participants had come to terms with their DM and expressed gratitude for it. Individuals who have embraced their diabetes generally possessed a more optimistic outlook and exhibit greater drive to manage the condition, as said by P-22, "I just accept my disease (Diabetes) as it is ..." However, we found that this acceptance often took the form of reckless behaviour to cope with their stress. This coping strategy was found in several participants who experienced stress over their diet such as stated by P-20, "I just enjoy my life, I just eat anything I want to eat, and I don't control my diet meticulously anymore ..."

3.3.3 Self-management

Self-management, including adhering to a diet and regularly taking medication, had become a popular therapy for maintaining blood glucose levels. Participants expressed a sense of responsibility to control their own blood glucose levels and to avoid symptoms of diabetes. The burden of the disease resulted in stress if medication was not taken due to negligence, leading to diabetes symptoms. One way to proactively address this issue was to administer the medication prior to meals to enable direct consumption as said by a participant, "I always prepare my medicine that I will drink before mealtime, so I don't forget.." (P-13).

3.3.4 Positive attitudes

Several participants expressed positive attitudes towards the medical staff's recommendations, stating that following them could reduce their stress levels. They perceived the recommendations as professional and appreciated the staff's deep understanding of diabetes therapy, which helped them accept the referral. This was reported by P-13, "I am never late to consume my meds, because I follow the doctor's instructions that said my disease will be much worse if I forget to drink my medicine ..."

However, some participants offered negative feedback about the medical staff's recommendation. They stated that they did not adhere to the DM diet recommendation suggested by the medical staffs and instead implemented their own version based on their personal experience that was stated by one participant, "I did not follow the meal plan that was recommended by the nutritionist ... I made my version of my meal plan such as eating one or two times a day" (P-19).

3.3.5 Understanding of their illness

The experience enabled certain participants to manage their stress. This experience could come from their own experience or the experiences of others. Some participants reported that the experience was originated from personal situations, such as the repercussions of errors made during their diabetes treatment. This was reported by two participants: "... Now I limit my blood sugar content to not exceed 200, especially after my leg was amputated after being wounded" (P-2), and "I was late on my routine appointments once and I felt numb sensations on my feet ... Because I was afraid of the risk of being amputated, I started my routine check ups regularly again" (P-4).

3.3.6 Joining the diabetes community

Being part of a community with peers who shared similar experiences, such as the diabetes group, might increase the well-being of those with diabetes. Based on the interview, a number of participants reported positive impacts following their involvement in this community. The participants highlighted the opportunity to meet with others sharing the same disease, which in turn, provided them with motivation and encouragement. There were several noteworthy results in the coping strategies. It was observed that joining a community could effectively lessen stress levels. This was stated by participant P-18, "... When I met with the Diabetes Mellitus community, I felt very comfortable and happier ... I also stopped consuming carbohydrates and did breathing exercises," and was also supported by participant P-23: "It was when I visited my community members that I felt more confident and had more motivation to share and discuss things and experiences about Diabetes with the members ..."

However, several errors in the medical nutrition knowledge disseminated within the community were identified. The recommended diet in the community does not align with the DM principle. Nevertheless, these outcomes were not probed further as it fell beyond the scope of the research.

3.3.7 Spirituality

Spirituality as a coping strategy has an abstract interpretation and will vary between individuals. Several participants used T2DM as a way to get closer to God. Participants believed that God could heal their diabetes since diabetes was a medically incurable disease as reported by a participant, "The doctor said that my diabetes cannot be cured. Thus, I got myself more involved with God through my prayer ..." (P-2).

3.3.8 Getting more information about T2DM

In order to live with DM, one participant improved his knowledge about T2DM through self-education. The participant said that he sought information about T2DM by consulting to doctors and reading research journals. Particiapants who did this often had a bachelor's degree, as said by one of them, "Apart from the doctor consultation, I often searched for information from many credible literature sources" (P-3).

4. Discussion

The aim of this study was to investigate the sources of distress and coping strategies in male DM patients. This aim was answered by the results of the study showing that eight distress's sources and eight coping strategies were identified as two main themes among Indonesian men with type-2 diabetes mellitus. Each of the themes will be discussed in the following section.

4.1 Sources of distress

This research had identified the sources of diabetes-related distress and effective coping strategies among men with T2DM. The sources of distress were emotional in nature, manifested as a burden of disease, a lack of knowledge, concerns about healthcare services, difficulties in managing diet, coping with routine medication, financial stress and fatigue related to T2DM.

Most participants experienced emotional distress, including fear and anxiety related to inadequate knowledge about diabetes management and fear of mortality. Their concerns pertained to the responsibility of men towards their families. These findings align with earlier systematic review research which indicated that male diabetes patients exhibited symptoms of anxiety (18%) and depression (29.4%) (Garcia-Lara et al., 2022). This is also believed to be associated with anxieties about future diabetes complications and decreased quality of life (Sharma et al., 2021). However, the majority of participants in this study indicated an enhanced confidence in managing their diabetes along the time and no longer experienced the same sentiments. Nonetheless, some participants reported persisting stress, fear and unease despite having lived with diabetes for several years. This phenomenon was similarly discovered in an alternative study by Yu et al. (2020), which tracked 24-month stress levels in 3,263 individuals diagnosed with diabetes. This research reveals that over 50% of participants reported experiencing persistent diabetes-related distress following their initial diagnosis (Yu et al., 2020). A further investigation found that patients with diabetes experienced repeated distress when undergoing an ongoing therapy process, leading to high and sustained levels of distress (Kuniss et al., 2021).

The impact of the disease burden was another source of stress experienced by most participants. This stress occurred when they failed to adhere to diabetes management, primarily in relation to their diet and prescribed medication. One of the effects reported by participants was disrupted sleep, which led to difficulties in carrying out their daily activities. A previous study indicates that a third of individuals with DM experience sleep disturbances, which can arise from several factors linked to substandard disease management (Surani et al., 2015). Sleep disturbances may present as nocturia, nocturnal hypoglycaemia, peripheral neuropathy, restless leg syndrome, or sleep-disordered breathing. When associated with DM, these factors could result in fragmented sleep and a diminished quality of life (Khandelwal et al., 2017).

This study discovered that individuals lacked understanding about managing diabetes, particularly in regard to medication and diet. This deficiency in knowledge led participants to form their own opinions that do not align with scientific medical therapy guidelines. This could result in detrimental consequences for diabetes management results, thus putting a burden of stress on men with T2DM. A study revealed that over half of diabetes patients exhibited inadequate knowledge regarding the symptoms, treatment, and complications of T2DM (Almousa et al., 2023). Correspondingly, Siddique et al. (2017) reported that a mere 18% of T2DM patients demonstrated sufficient knowledge regarding diabetes.

Participants also reported experiencing stress due to healthcare services. They felt that their diabetes condition was not given enough attention, particularly demonstrated by the brief consultation time. According to research conducted by Irving et al. (2017), consultation times with doctors in developing countries tend to be shorter than those in developed countries. Insufficient consultation time not only negatively impacts patient care, but also puts pressure on medical staff. This result was supported by research conducted by Holton et al. (2022), which revealed that one in five participants reported insufficient discussion time with medical staffs to resolve their diabetes concerns. This study identified that the majority of participants utilised BPJS, the Indonesian National Health Insurance, to access healthcare and consult with to specialist doctors. However, a few participants still faced financial difficulties. Although it may not be the primary cause of stress related to healthcare services, further exploration is necessary to determine its potential impact.

Managing the diet was also found as the distress's source. The primary challenge in dietary management was the implementation of strict eating regulations and the subsequent impact on blood sugar. This had been identified as a significant source of distress experienced by patients diagnosed with T2DM. A review of the literature indicates that the difficulty in regulating blood sugar levels, which may be caused by complex dietary patterns, can lead to stress in individuals with diabetes, in addition to elevated blood sugar levels that result in an increase in stress hormones (Sharma et al., 2022). This highlights the pressing need for nurses and other healthcare workers to emphasise the significance of dietary management and stress reduction as key factors in the prevention of adverse outcomes in patients with diabetes (Rustini et al., 2020).

In this study, the participants indicated that non-compliance with treatment was the cause of stress during the treatment period. This finding aligns with a review that identified elevated stress among individuals with T2DM who were non-compliant with treatment (Roohafza et al., 2016). A study found that non-compliance with treatment was driven by patients' distrust of the efficacy of the prescribed treatment and their concerns about its potential adverse effects (Rezaei et al., 2019). Furthermore, the results of data gathered from participants indicated that financial distress was not a direct consequence of their condition, due to the availability of insurance services. However, there have been reports of adaptive failures, such as the inability to afford healthcare costs, being associated with low levels of distress in individuals with T2DM (Patel et al., 2023). However, other studies indicate that the high prevalence of stress in T2DM sufferers without financial problems may result from a lack of utilisation of health services (Vidyulatha et al., 2022). This finding was also evident in the participants of this study.

It had also been observed that individuals suffering from type 2 diabetes mellitus (T2DM) frequently reported to experience fatigue. A study suggests that this condition may be caused by a range of factors, including sleep disturbances, the onset of pain and changes in the patient's body mass index (BMI) (Singh et al., 2016). It is possible that the various stress responses associated with fatigue may be influenced by a number of factors, with the specific causes being different for each individual (Hidayat et al., 2020). This finding was corroborated by participants in this study.

4.2 Coping strategies

The study also identified some coping strategies carried out by male T2DM patients, such as receiving support from family, acceptance, self-management, maintaining a positive attitude, understanding of illness, joining a diabetes community, seeking spiritual guidance, and obtaining additional information. These results slightly deviated from previous research.

This study highlighted that supports from family members, particularly a wife and children, could effectively enhance self-management strategies among men with T2DM. A systematic review has similarly found evidence supporting the involvement of family in enhancing self-management and health outcomes for patients with type-2 diabetes (Pamungkas et al., 2017). Family acts as a motivating factor for men with T2DM to adhere to diabetes management owing to their role as heads of the household. The participants noted that they fulfiled the role of head of the family, resulting in a sense of responsibility to provide funds for their household. This aligns with a patriarchal concept adopted by most Indonesian cultures, where men are regarded as the "head of the family" and held accountable for the financial state of the family unit (Raharjo et al., 2018). A sense of responsibility towards family had a very positive impact on self-management and positive attitude coping strategies. Apart from the family support, a strategy reported by participants for coping with stress was to accept the disease and thought positively. This represents a form of diplomacy on the part of T2DM patients in relation to the conditions they experience (Hapunda, 2022). Another study reported that the combined intervention of acceptance and commitment in ACT therapy proved successful in controlling the stress levels of T2DM patients (Nobel et al., 2023), thereby corroborating the findings of this qualitative research.

Self-management practices, employed by participants as coping strategies, had proven to be very effective in managing stress. These practices offered a practical and objective approach to reducing stress without the need for external interventions. The use of self-management methods, therefore, could be considered as a primary strategy for stress reduction. This finding is supported by Eshete et al.'s (2023) research which indicates that effective self-management is a strategy for coping with distress that can lower stress levels in patients with T2DM. Although it was deemed an effective method for managing stress, this approach was only suitable if the patient possessed adequate knowledge regarding regulating their diet and medication use for the illness (Mikhael et al., 2019).

The next coping strategy was positive attitude. The degree to which participants adhere to their therapy was a positive attitude that resulted in a state where they could take control and felt confident in managing their illness. Participants also recognised the significance of always adhering to professional advice. A cross-sectional study endorses these findings, where patients with T2DM who hold positive attitudes exhibit higher rates of coping stress than other groups (Arifin et al., 2020). The patient's positive attitude towards their illness produced comprehension and reduces stress. Positive patient behaviour, combined with adequate knowledge and compliance, has been previously reported by Almousa et al., (2023) to have a crucial role in mitigating stress in diabetic patients. Therefore, it is highly recommended that healthcare professionals maximize this period via educating their patients (Almousa et al., 2023).

This study discovered that one method by which participants comprehended their illness was through personal understanding of their illness and seeking further information, either independently or with supports from healthcare professionals. Understanding of their illness through personal experience, as perceived, improved participants' self-management since they wished to avoid a recurrence of the same. As an illustration, participants learn from the experience of feeling dizzy, weak, and numb in their legs when they fail to take control promptly. This self-efficacy has also been recorded by a previous study that found a positive association between self-efficacy and the level of coping strategies among DM patients (Kurniyawan et al., 2022). This improved their ability to self-manage and acts as a reminder to prevent the occurrence of a similar experience in the future. With experience, individuals with diabetes mellitus will reach a state where the condition is integrated into daily life, gradually providing them with greater control over potential stressors (van Smoorenburg et al., 2019).

Several participants reported social support experience upon joining a diabetes community. As noted in a review of multiple prior studies, a lack of social support among those living with diabetes mellitus may increase the risk of developing depression (Azmiardi et al., 2022). While involvement in various community-based activities, especially regular discussions addressing their issues, led to increased levels of happiness and motivation. This finding was supported by a previous study that found an inverse correlation between social support and the extent of emotional distress among those with DM (Ramkisson et al., 2017). Evidently, higher levels of social support offered DM patients a better coping strategy against emotional distress. This study also revealed that the use of spirituality as a coping strategy was less efective among participants, and this trend was consistent with previous research indicating that men exhibit lower levels of spirituality than women and were less inclined to use it as a coping strategy for stress (Gugun et al., 2021). Only one participant in this study noted spiritual coping, but no further explanation was given at the end of this investigation.

The last coping strategy was getting more information about T2DM. While some participants made an effort to understand their illness, this coping option was only utilized by a few of them. The study observed that the latter participants carried out further independent research on the disease by studying journals, which could explain why not everyone was able to take this approach. It has been previously established that diabetic patients with lower knowledge may possess more stress facing their condition (Li et al., 2022). The acquisition of knowledge can facilitate an understanding of the disease experienced by patients with T2DM, thus enabling them to cope more effectively with the stressors that arise in the context of their condition (Najjar et al., 2020). It is possible to further review this finding, despite the lack of further exploration in this qualitative study.

5. Implication and limitation

This research finding implies that nurses and other health workers can utilize a variety of coping strategies to help men with T2DM to overcome the distress caused by their disease. Such strategies may thus facilitate the provision of optimal support, which is essential for the successful implementation of comprehensive therapy. However, the research is constrained by the fact that the responses provided by participants may have been influenced by the direct presence of the interviewer (zoom versus face-to-face) which could have affected the outcomes. Although the researcher made efforts to mitigate this particular bias by involving two interviewers for each participant, it was not possible to eliminate it completely.

6. Conclusion

This research highlighted that men with T2DM experienced eight types of distress, with emotional burden being the most dominant. The study also found that family support was the primary coping strategy among the eight coping strategies explored. This research has important implications for nurses and other health professionals. It helps them to assist patients in identifying distress and provides suggested alternative coping strategies that might be used to overcome it. Moreover, further research is required to ascertain which coping strategies are the most effective based on existing research results. These results will inform the selection of priority coping strategies that can be used to support the treatment of type-2 diabetes.

Acknowledgment

The authors would like to thank Research and Community Service Agency (BPPM), Faculty of Health Sciences, Universitas Brawijaya for financial support through BNPB FIKES funding No.3492/UN10.F17.06/TU.00/2023 and appreciation for 4th International Nursing and Health Sciences Symposium.

Author contribution

Research conceptualisation was carried out by FAN. The methodology and formal analysis were conducted by FAN, RBC, NL, SR and ANLH. Supervision and validation were provided by FAN, IK, ARC and LAI. Funding acquisition and funding administration were undertaken by FAN in collaboration with IK. The original draft of the manuscript was written by FAN, RBC, NL, SR, IK, ARC and LAI, while review and editing were conducted by FAN.

Conflict of interest

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

References

Adasi, G. S., Amponsah, K. D., Mohammed, S. M., Yeboah, R., & Mintah, P. C. (2020). Gender differences in stressors and coping strategies among teacher education students at University of Ghana. *Journal of Education and Learning*, *9*(2), 123-133. https://doi.org/10.5539/jel.v9n2p123

Almousa, A. Y., Hakami, O. A., Qutob, R. A., Alghamdi, A. H., & Alaryni, A. A. (2023). Knowledge, attitude, and practice toward diabetes mellitus and their association with socioeconomic status among patients with type 2 diabetes mellitus in Saudi Arabia. *Cureus*, *15*(5), e39641. https://doi.org/10.7759/cureus.39641

Arifin, B., Probandari, A., Purba, A. K. R., & Perwitasari, D. A. (2020). 'Diabetes is a gift from God' A qualitative study coping with diabetes distress by Indonesian outpatients. *Quality of Life Research, 29*(1), 109-125. https://doi.org/10.1007/s11136-019-02299-2

Azmiardi, A., Murti, B., Febrinasari, R. P., & Tamtomo, D. G. (2022). Low social support and risk for depression in people with type 2 diabetes mellitus: A systematic review and meta-analysis. *Journal of Preventive Medicine & Public Health*, *55*(1), 37-48. https://doi.org/10.3961/jpmph.21.490

Bak, E., Marcisz, C., Nowak-Kapusta, Z., Dobrzyn-Matusiak, D., Marcisz, E., & Krzeminska, S. (2018). Psychometric properties of the Audit of Diabetes-Dependent Quality of Life (ADDQoL) in a population-based sample of Polish adults with type 1 and 2 diabetes. *Health Qual Life Outcomes*, *16,* 53. https://doi.org/10.1186/s12955-018-0878-y

Bilsker, D., Fogarty, A. S., & Wakefield, M. A. (2018). Critical issues in men's mental health. *The Canadian Journal of Psychiatry*, *63*(9), 590-596. https://doi.org/10.1177/0706743718766052

Campbell, S., Greenwood, M., Prior, S., Shearer, T., & Walkem, K. (2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing*, *25*(8), 652-661. https://doi.org/10.1177/1744987120927206

Dewi, S., Anugrah, I. H., Permana, I., Budhiana, J., & Melinda, F. (2021). Relationship of the coping mechanism with the quality of life in type 2 diabetes mellitus patients. *Jurnal Kesehatan Indra Husada*, *9*(1), 1-9. https://doi.org/doi.org/10.36973/jkih.v9i1.276

Eshete, A., Mohammed, S., Deresse, T., Kifleyohans, T., & Assefa, Y. (2023). Association of stress management behavior and diabetic self-care practice among diabetes type II patients in North Shoa Zone: A cross-sectional study. *BioMed Central Health Services Research*, *23*(767), 1-7. https://doi.org/10.1186/s12913-023-09752-6

Fukuda, N., Gandhi, K., Lim, E., & Leake, A. (2019). Validation of the diabetes distress scale in an Asian Pacific Islander population. *Hawai'i Journal of Medicine & Public Health*, *78*(1), 3-7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6333958/pdf/hjmph7801_0003.pdf

Garcia-Lara, R. A., Gomez-Urquiza, J. L., Membrive-Jimenez, M. J., Velando-Soriano, A., Granados-Bolivar, M. E., Romero-Bejar, J. L., & Suleiman-Martos, N. (2022). Anxiety, distress and stress among patients with diabetes during COVID-19 pandemic: A Systematic review and meta-analysis. *Journal of Personalized Medicine*, *12 (9),* 1412. https://doi.org/10.3390/jpm12091412

Gugun, A. M., Romadhon, Y. A., Nidaulfalah, G., & Aprilia, S. (2021). The correlation between Islamic spirituality and distress in type-2 diabetes mellitus patients. *Mutiara Medika: Jurnal Kedokteran dan Kesehatan*, *21*(2), 102-109. https://doi.org/10.18196/mmjkk.v21i2.10848

Hapunda, G. (2022). Coping strategies and their association with diabetes specific distress, depression and diabetes self-care among people living with diabetes in Zambia. *BioMed Cetral Endocrinology Disorder*, *22,* 215. https://doi.org/10.1186/s12902-022-01131-2

Hidayat, B. F., Sukartini, T., & Kusumaningrum, T. (2020). A Systematic review of fatigue in type 2 diabetes. *Jurnal Ners*, *15*(2020), 513-517. https://doi.org/10.20473/jn.v15i2(si).20520

Holton, S., Rasmussen, B., Turner, J., Steele, C., Ariarajah, D., & Hamblin, S. (2022). Nurse, midwife and patient perspectives and experiences of diabetes management in an acute inpatient setting: A mixed-methods study. *BioMed Central Nursing*, *21,* 249. https://doi.org/10.1186/s12912-022-01022-w

Irving, G., Neves, A. L., Dambha-Miller, H., Oishi, A., Tagashira, H., Verho, A., & Holden, J. (2017). International variations in primary care physician consultation time: A systematic review of 67 countries. *British Medical Journal Open*, *7,* e017902. https://doi.org/10.1136/bmjopen-2017-017902

Khandelwal, D., Dutta, D., Chittawar, S., & Kalra, S. (2017). Sleep disorders in type 2 diabetes. *Indian Journal of Endocrinol and Metabolism*, *21*(5), 758-761. https://doi.org/10.4103/ijem.IJEM_156_17

Kountul, Y. P. D., Kolibu, F. K., & Korompis, G. E. C. (2018). The relationship between gender and peer influence with stress levels of students at the faculty of public health, Sam Ratulangi University, Manado. *Kesmas: Jurnal Kesehatan Masyarakat Universitas Sam Ratulangi*, *7*(5), 1-7. https://ejournal.unsrat.ac.id/index.php/kesmas/article/view/22558

Kuniss, N., Kramer, G., Muller, U. A., Wolf, G., & Kloos, C. (2021). Diabetes related distress is high in inpatients with diabetes. *BioMed Central Diabetology & Metabolic Syndrome*, *13,* 40. https://doi.org/10.1186/s13098-021-00659-y

Kurniyawan, E. H., Nadziroh, U., Widayati, N., & Wantiyah, W. (2022). Correlation between self efficacy and coping mechanism in patients with type 2 diabetes mellitus. *Nursing and Health Sciences Journal*, *2*(2), 174-178. https://doi.org/10.53713/nhs.v2i2.121

Kurtanty, D., Bachtiar, A., Candi, C., Pramesti, A., & Rahmasari, A. F. (2023). Information-motivation-behavioral skill in diabetes self-management using structural equation modeling analysis. *Kesmas: Jurnal Kesehatan Masyarakat Nasional*, *18*(1), 16-23. https://doi.org/10.21109/kesmas.v18i1.6255

Kusumawati, I. (2015). *Adherence to a diet in view of gender and education level in type 2 diabetes mellitus patients* [Bachelor Thesis, Universitas Muhammadiyah Surakarta]. Eprint UMS. https://eprints.ums.ac.id/37443/11/02.%20Naskah%20Publikasi.pdf

Li, H., Wang, L., Huang, J., Li, B., & Qiu, T. (2022). The relationship between the knowledge of diabetes mellitus and the mental, psychological and emotional status of T2DM patients based on a structural equation model. *Sciencetific Reports*, *12, 20714.* https://doi.org/10.1038/s41598-022-25211-4

Mathew, R., Gucciardi, E., de Melo, M., & Barata, P. (2012). Self-management experiences among men and women with type 2 diabetes mellitus: A qualitative analysis. *BioMed Central Family Practice*, *13,* 122. https://doi.org/10.1186/1471-2296-13-122

Mikhael, E. M., Hassali, M. A., Hussain, S. A., & Shawky, N. (2019). Self-management knowledge and practice of type 2 diabetes mellitus patients in Baghdad, Iraq: A qualitative study. *Diabetes, Metabolic Syndrom and Obesity*, *2019*(12), 1-17. https://doi.org/10.2147/DMSO.S183776

Najjar, M. A., Demeh, W. M., & Yacoub, M. I. (2020). Knowledge and coping strategies among patients diagnosed with type 2 diabetes mellitus. *Global Journal of Health Science*, *12*(2), 69-77. https://doi.org/10.5539/gjhs.v12n2p69

Nobel, B., Susanti, S., Pranata, S., & Cherry, M. (2023). The acceptance and commitment therapy (ACT) reduce stress in patients with type 2 diabetes mellitus. *Scripta Medica*, *54*(4), 329-341. https://doi.org/10.5937/scriptamed54-45794

Pamungkas, R. A., Chamroonsawasdi, K., & Vatanasomboon, P. (2017). A systematic review: Family support integrated with diabetes self-management among uncontrolled type II diabetes mellitus patients. *Behavioral Sciences*, *7*(3), 62. https://doi.org/10.3390/bs7030062

Patel, M. R., Anthony Tolentino, D., Smith, A., & Heisler, M. (2023). Economic burden, financial stress, and cost-related coping among people with uncontrolled diabetes in the U.S. *Preventive Medicine Reports*, *34,* 102246. https://doi.org/10.1016/j.pmedr.2023.102246

Raharjo, A., Retnowulandari, W., & Sudrajat, T. (2018). A review of the “head of the family” concept from the family law, gender perspective. *Web of Conferences*, *54,* 02008. https://doi.org/10.1051/shsconf/20185402008

Ramkisson, S., Pillay, B. J., & Sibanda, W. (2017). Social support and coping in adults with type 2 diabetes. *African Journal of Primary Health Care & Family Medicine*, *9*(1), e1-e8. https://doi.org/10.4102/phcfm.v9i1.1405

Rezaei, M., Valiee, S., Tahan, M., Ebtekar, F., & Ghanei Gheshlagh, R. (2019). Barriers of medication adherence in patients with type-2 diabetes: A pilot qualitative study. *Diabetes Metabolic Syndrome and Obesity*, *12*(2), 589-599. https://doi.org/10.2147/DMSO.S197159

Riskesdas. (2019). *Laporan Provinsi Jawa Timur: RISKESDAS 2018 [East Java Province report: RISKESDAS 2018].* Badan Penelitian dan Pengembangan Kesehatan. http://ejournal2.bkpk.kemkes.go.id/index.php/lpb/article/view/3752

Roohafza, H., Kabir, A., *Sadeghi*, M., Shokouh, P., Ahmadzad-Asl, M., & Khadem-Maboudi, A. A. (2016). Stress as a risk factor for noncompliance with treatment regimens in patients with diabetes and hypertension. *ARYA Atherosclerosis*, *12*(4), 166-171. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5266132/pdf/ARYA-12-166.pdf

Rustini, S. A., Nurhayati, C., & Sari, N. A. (2020). Relationship of stress levels and diet with blood sugar levels in patients of type 2 diabetes mellitus. *STRADA Jurnal Ilmiah Kesehatan, 9*(1), 241-247. https://doi.org/10.30994/sjik.v9i1.253

Setyoadi, S., Efendi, F., Haryanto, J., Rosyidawati, F., Kristianingrum, N. D., Srihayati, Y., & Ismail, D. D. S. L. (2023). Family coping strategies and quality of life of patients with type-2 diabetes mellitus in primary health care in Indonesia. *Nurse Media Journal of Nursing*, *13*(3), 274-285. https://doi.org/10.14710/nmjn.v13i3.56700

Sharma, K., Akre, S., Chakole, S., & Wanjari, M. B. (2022). Stress-induced diabetes: A review. *Cureus*, *14*(9), e29142. https://doi.org/10.7759/cureus.29142

Sharma, K., Dhungana, G., Adhikari, S., Bista Pandey, A., & Sharma, M. (2021). Depression and anxiety among patients with type II diabetes mellitus in Chitwan Medical College Teaching Hospital, Nepal. *Nursing Research Practice*, *2021,* 8846915. https://doi.org/10.1155/2021/8846915

Siddique, M. K. B., Islam, S. M. S., Banik, P. C., & Rawal, L. B. (2017). Diabetes knowledge and utilization of healthcare services among patients with type 2 diabetes mellitus in Dhaka, Bangladesh. *BioMed Central Health Services Research*, *17,* 586. https://doi.org/10.1186/s12913-017-2542-3

Singh, R., Teel, C., Sabus, C., McGinnis, P., & Kluding, P. (2016). Fatigue in type 2 diabetes: Impact on quality of life and predictors. *PLoS One*, *11*(11), e0165652. https://doi.org/10.1371/journal.pone.0165652

Situngkir, D. (2018). *Bahaya psikososial dan stres kerja [Psychosocial hazards and work stress].* Universitas Esa Unggul. https://bahan-ajar.esaunggul.ac.id/kmk474/wp-content/uploads/sites/1051/2019/11/PPT-UEU-Bahaya-Psikososial-Stress-Kerja-Pertemuan-2.pdf

Surani, S., Brito, V., Surani, A., & Ghamande, S. (2015). Effect of diabetes mellitus on sleep quality. *World Journal of Diabetes*, *6*(6), 868-873. https://doi.org/10.4239/wjd.v6.i6.868

Surjoseto, R., & Sofyanty, D. (2022). Coping mechanisms in type 2 diabetes mellitus patients at the internal medicine polyclinic at Cipto Mamgunkusumo hospital. *Jurnal Kesehatan dan Kedokteran*, *1*(3), 24-28. https://journal.admi.or.id/index.php/JUKEKE/article/view/292

Van Smoorenburg, A. N., Hertroijs, D. F. L., Dekkers, T., Elissen, A. M. J., & Melles, M. (2019). Patients' perspective on self-management: Type 2 diabetes in daily life. *BioMed Central Health Services Research*, *19,* 605. https://doi.org/10.1186/s12913-019-4384-7

Vidyulatha, J., Pramodkumar, T., Pradeepa, R., Deepa, M., & Poongothai, S. (2022). Prevalence and impact of stress among individuals with type 2 diabetes attending a tertiary diabetes center in South India. *Journal of Diabetology*, *13*(1), 122-128. https://doi.org/10.4103/jod.jod_12_22

WHO. (2020). *Diagnosis and management of type-2 diabetes (HEARTS-D).* WHO. https://www.who.int/publications/i/item/who-ucn-ncd-20.1

Wilson, M. J., Seidler, Z. E., Oliffe, J. L., Toogood, N., & Kealy, D. (2022). "Appreciate the little things": A qualitative survey of men's coping strategies and mental health impacts during the COVID-19 pandemic. *American Journal of Mens Health*, *16*(3), 1-17. https://doi.org/10.1177/15579883221099794

Wirihana, L., Welch, A., Williamson, M., Christensen, M., Bakon, S., & Craft, J. (2018). Using Colaizzi's method of data analysis to explore the experiences of nurse academics teaching on satellite campuses. *Nurse Reseacher*, *25*(4), 30-34. https://doi.org/10.7748/nr.2018.e1516

Younis, B. B., Arshad, R., Yousuf, H., Salman, F., Masood, J., & Khurshid, S. (2017). Impact of type 2 diabetes mellitus on quality of life in people with diabetespresenting to a specialist diabetes clinic. *Turkish Journal of Medical Scicences*, *47*(1), 123-126. https://doi.org/10.3906/sag-1508-3

Yu, J. S., Xu, T., James, R. A., Lu, W., & Hoffman, J. E. (2020). Relationship between diabetes, stress, and self-management to inform chronic disease product development: Retrospective cross-sectional study. *Journal of Medical Internet Research Diabetes*, *5*(4), e20888. https://doi.org/10.2196/20888

Ziabari, S. S. M., & Treur, J. (2018). Computational analysis of gender differences in coping with extreme stressful emotions. *Procedia Computer Science*, *145*(2018), 376–385. https://doi.org/10.1016/j.procs.2018.11.088

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):125-141, April 2024
https://doi.org/10.14710/nmjn.v14i1.52508

ORIGINAL RESEARCH

Perceptions and Experiences of Nursing Students in Caring for People Living with HIV/AIDS in South Africa: A Qualitative Study

Ruwadzano Dorcas Mabhiza[1], Varshika Bhana[1], Heather Sedibe[1]

[1]*Department of Nursing Science, School of Healthcare Sciences, University of Pretoria, South Africa*

Article Info

Article History:
Received: 15 February 2023
Revised: 26 April 2024
Accepted: 27 April 2024
Online: 30 April 2024

Keywords:
Caring; People Living with HIV (PLHIV); perceptions; role; nursing student

Corresponding Author:
Ruwadzano Dorcas Mabhiza
Department of Nursing Science, School of Healthcare Sciences, University of Pretoria, South Africa
Email: drmabhiza@gmail.com

Abstract

Background: Although previous studies focusing on nurses' perceptions of caring for people living with HIV (PLHIV) have been conducted in numerous countries, little is known about first-year student nurses' perceptions and experiences regarding their role in caring for PLHIV in South Africa. To ensure quality care for PLHIV, it is essential to explore first-year student nurses' roles in caring for PLHIV.
Purpose: This study aimed to explore the perceptions and experiences of first-year nursing students on their role in caring for PLHIV in South Africa.
Methods: A qualitative exploratory descriptive design was employed for this study, utilizing a purposive sampling method to recruit 18 participants. These participants were first-year nursing students aged 18 or older, enrolled in a 4-year bachelor's degree nursing program, and who had completed clinical placements in hospitals. Data collection involved two focus group discussions (FGDs), one comprising eight participants and the other ten participants. Thematic analysis was employed to analyze the collected data.
Results: Four main themes were drawn from two FGDs, including (1) students' unpreparedness in their role to care for PLHIV, (2) disclosure practices and student safety concerns, (3) personal backgrounds and attitudes towards PLHIV care, and (4) physical and psychological wellbeing of students while caring for PLHIV. Furthermore, 11 sub-themes were subsequently drawn from these main themes. Thematic sub-themes and individual focus group responses were relied on to reach data saturation despite the small number of FGD sessions.
Conclusion: First-year nursing students had negative and positive perceptions and experiences when caring for PLHIV. There is a need for these students to acquire adequate theoretical knowledge and practical skills to enhance clinical preparation for their role in clinical facilities. This could improve their perceptions regarding caring for PLHIV in the clinical setting and result in improved care.

How to cite: Mabhiza, R. D., Bhana, V., & Sedibe, H. (2024). Perceptions and experiences of nursing students in caring for people living with HIV/AIDS: A qualitative study. *Nurse Media Journal of Nursing, 14*(1), 125-141. https://doi.org/10.14710/nmjn.v14i1.52508

1. Introduction

The HIV/AIDS pandemic presents a significant global public health challenge, with around 37.9 million people living with HIV (PLHIV) worldwide, and two-thirds of them residing in Sub-Saharan Africa (Avert, 2021). South Africa remains at the forefront of the HIV/AIDS epidemic, with 20.4% of its population being PLHIV (Avert, 2021). Despite this, South Africa has made notable progress in recent years, setting ambitious goals aimed at achieving zero new infections, zero HIV-related deaths, and zero HIV-related stigma and discrimination (South African National AIDS Council, 2015). This has led to a high percentage of PLHIV being aware of their status in the country, although it has also placed considerable strain on the healthcare system. The burden of HIV/AIDS on hospital services is increasing as the epidemic persists, and antiretroviral treatment becomes more accessible (Mills et al., 2011).

Worldwide, nurses represent the highest number of healthcare providers who assist PLHIV in rural or urban areas, hospital, or community settings (Squires et al., 2015). Nurses, being in high numbers in the healthcare provision sector, are more in contact with all admitted patients in the hospital wards, including PLHIV. Nursing students form part of this nursing population as they are actively involved in caring for PLHIV during their clinical placement as part of their nursing program. Early studies, as far back as the year 2002, displayed the unwillingness of nursing students to provide care for PLHIV due to their concern of being infected with HIV. Moreover, current studies have clearly shown that negative perceptions towards PLHIV persist among nursing students throughout the world (Pickles et al., 2017).

In South Africa, nursing education is a critical part of healthcare system, aiming to produce caring nurses who are able to serve diverse healthcare needs. Nursing education programs usually follow a structured curriculum including theoretical knowledge with practical clinical experience. Nursing education in South Africa is primarily offered at tertiary institutions such as universities and colleges. These institutions constitute nursing programs, including diplomas, degrees, and postgraduate qualifications in nursing. The curriculum for nursing programs is developed in alignment with national regulatory bodies such as the South African Nursing Council (SANC), which sets standards for nursing education and practice in the country (South African Nursing Council, 1984). Clinical practice is a fundamental aspect of nursing education in South Africa. Nursing students are required to complete clinical placements in various healthcare settings, including hospitals, clinics, and community health centers. These clinical placements provide students with hands-on experience under the supervision of qualified nurses and other healthcare professionals. During their clinical practices, students are exposed to a wide range of patient populations, including PLHIV. Clinical experiences allow students to apply theoretical knowledge gained in the classroom to real-life patient care situations (Pervaz Iqbal, 2020). Additionally, nursing students are expected to adhere to professional standards and ethical principles while providing care to patients, including those affected by HIV/AIDS (Marranzano et al., 2013). In South Africa, nursing education also highlights the importance of interprofessional relationships and teamwork in healthcare delivery (Armstrong & Rispel, 2015). They often work alongside other healthcare professionals, including doctors, pharmacists, and social workers, to provide holistic care to patients, including PLHIV.

First-year nursing students are among the nursing populations who, under the supervision of practicing registered nurses and clinical facilitators, are given roles such as admitting patients, history taking, specimen collection, bed baths, turning patients, wound care, and health education (Wang et al., 2022). These first-year student nurses are expected to spend a minimum of 536 hours in the hospital wards within their training period to attain clinical experience (South African Nursing Council, 1984). To ensure that student nurses achieve their required clinical experience, qualified practicing nurses mentor them, and clinical facilitators monitor them and assist them with clinical training in the wards, fulfilling their expected role in caring for all patients, including PLHIV. However, nursing students have been found to have negative perceptions towards PLHIV, and, as a result, most of the patients have become victims of ill-treatment, discrimination, and isolation, which usually results in poor health-seeking behaviors that have negative effects on the HIV and acquired immunodeficiency syndrome (AIDS) pandemic (Pickles et al., 2017). These attitudes may be related to the nurses' fear of contracting HIV, which may be because of culturally construed beliefs and perceptions (Pickles et al., 2017), and a lack of knowledge or misinformation (Akansel et al., 2012).

The first-year nursing students are very clinically inexperienced but are faced with real-life practical situations that they must endure despite the support they receive from their mentors (Pickles et al., 2017). There is a research literature gap in the assessment of perceptions of first-year student nurses in their care of PLHIV in the clinical setting. A comparative study on Turkish and American undergraduate nursing students on their attitudes toward PLHIV showed that students from both countries mostly had positive attitudes towards PLHIV (Atav et al., 2015). This study was not done specifically on first-year students, although they were part of the population researched. Another study in Tanzania proved that nursing students were willing to work with PLHIV with minimal stigmatizing perceptions; however, they lacked knowledge of routes of HIV and AIDS infection as they only recognized sexual intercourse and needle sharing in drug use as routes of HIV transmission (Aggarwal et al., 2017). In Zimbabwe, of the 89.1% student nurses who had cared for PLHIV in the hospitals, 21.8% said that they were afraid, while 21.8% of the respondents also felt uncomfortable, 23.4% did not mind taking care of PLHIV, while 9.4% verbalized not being afraid of caring for PLHIV (Katsinde et al., 2011).

No recent studies have been conducted in South Africa on the nursing students' perceptions and experiences of their role in caring for PLHIV in the clinical setting. More importantly, first-year nursing students were the chosen population in this research as previous studies in other countries were done on all nursing students excluding the first years. A study conducted in Barcelona (Spain) revealed that the attitudes of student nurses improved as their level of training increased (Leyva-Moral et al., 2017). Hence the less experienced first-year students would better describe their perceptions of the role of caring for PLHIV. Therefore, this study was conducted to explore the perceptions and experiences of first-year nursing students regarding the care of PLHIV. The study is expected to identify gaps in students' roles in PLHIV care and recommend areas for improvement to enhance healthcare quality.

2. Methods

2.1. Research design

This study adopted a qualitative exploratory descriptive design to explore first-year nursing students' perceptions and experiences regarding their role in caring for PLHIV. This qualitative design aims to understand phenomena holistically, with a focus on narrative data collection methods such as focus group discussions.

2.2. Setting and participants

This study was conducted among students at a university in the Gauteng province of South Africa, which offers Bachelor of Nursing degrees, in October 2019. The choice of this university allowed for a familiar setting for the participants, as the focus group discussions (FGDs) used for data collection were held in lecture rooms where they typically attended classes. This familiarity was expected to encourage participants to express their perceptions freely without the need to adapt to a new environment. First-year nursing students were purposefully sampled to participate in the study. Purposeful sampling, as advocated by Speziale et al. (2011), is suitable for qualitative research, aiming to cultivate informative descriptions of a phenomenon. This method involves deliberately selecting participants from the target population who can provide rich and detailed insights. For this study, the recruitment of participants was carried out in lecture halls, where interested students who met specific inclusion criteria were approached. Eligibility criteria included being first-year student nurses over 18 years old, registered in a 4-year bachelor's degree in a nursing science course, and having undergone clinical placements in medical or surgical wards as part of their training. Convenience sampling was also employed based on the availability of students who volunteered to participate in the research. However, participants were still required to meet the eligibility criteria outlined above. This approach allowed for flexibility in participant recruitment while ensuring the inclusion of individuals with relevant experiences and knowledge related to the research topic. This study included 18 first-year nursing students. Two FGDs were conducted, with the first group comprising 10 participants and the second group comprising 8 participants.

2.3. Data collection

In this study, FGDs were chosen as the methodological approach to allow participants to freely express their perceptions. Two FGDs were conducted by involving 18 first-year nursing students. The facilitator, who had no prior relationships with the participants, ensured adherence to ethical guidelines during the FGDs. Participants were informed of the study's purpose and provided consent for audio recording, with confidentiality guaranteed. In addition to audio recording, detailed field notes were taken during the FGDs to document observations, non-verbal cues, and contextual information. Participant observation was also conducted to actively observe behaviors and interactions. The FGDs were conducted using a guideline developed by the researchers. The central question was "As first year nursing students what is your perceptions of your role in the caring of PLHIV in the clinical area?" Following this question, follow-up questions were also used, including: "How did you perceive your role when you were caring for PLHIV in the clinical setting?", "Do you feel that your role in caring for PLHIV puts you at risk of contracting HIV?", "How do you feel when you perform bed baths, collect sputum, and do hourly turns or other nursing tasks to PLHIV in the clinical setting?", and "How did you feel when you became aware you were nursing PLHIV?"

Ten participants engaged in the first FGD, followed by eight in the second, both conducted in English. Each FGD lasted approximately 35 and 50 minutes, respectively, with data saturation achieved in the second FGD. Data saturation showed that sufficient information had been gathered for a comprehensive understanding of participants' perceptions, making further data collection unnecessary. After the FGDs, the audio recordings were transcribed verbatim to ensure accurate capture of all verbal contributions.

2.4. Data analysis

The qualitative content analysis was used to analyze the meaning of participants' perceptions regarding their role in caring for PLHIV in the clinical setting following a structured approach by Botma et al. (2018). Initially, data transcription ensured accuracy and facilitated analysis by attributing speakers as "R" for the researcher and "P" for participants. Each data segment was transcribed individually to ensure precision (Creswell, 2014; Polit et al., 2017). Subsequently, essential concepts and ideas were identified from the data, forming smaller workable units for categorization. A category scheme was developed based on these concepts, facilitating consistent coding across interviews (Polit et al., 2017). The data were then grouped according to findings from two FGDs, and coding described settings, participants, and emerging themes. The researcher thoroughly read the data to ensure consistent coding across interviews, grouping data according to findings from the two FGDs. To fully understand the underlying meaning of some qualities of the data, the researcher read the categories three to four times. The researcher coded all the data and retrieved a coding balance across the interviews (Polit et al., 2017). The data were grouped according to the findings from two FGDs with different first-year student nurses. Next, coding was used to describe settings, participants, and themes emerging from the data. Categories formed themes representing the main findings of the study, supported by quotations and evidence. Themes were identified using color-coding for easy identification, depicting different experiences and perspectives from the participants and being supported by diverse quotations and specific evidence (Botma et al., 2018). In this study, the researcher used color-coding to indicate identified themes. The next step of data analysis involved presenting findings. The findings were narratively discussed, including main themes, subheadings, subthemes, direct quotations from participants, and different perspectives. Visual tables were used to illustrate findings and facilitate discussion. The final step of data analysis involved interpreting the data to find meaning. The researcher combined personal interpretation with existing literature or theories to derive lessons learned from the study. This interpretation aimed to uncover the true meaning of the data and participants' experiences in caring for PLHIV in clinical facilities, guided by the question: "What were the lessons learned?" The answer was a combination of the researcher's interpretation and literature or theories (Botma et al., 2018). The researcher interpreted the true meaning of the data and the first-year nursing students' experiences in caring for people living with HIV in clinical facilities. By following these comprehensive steps, the researchers thoroughly analyzed the qualitative data, leading to meaningful insights and interpretations aligned with the research question and objectives.

2.5. Rigor/trustworthiness

In this study, several principles were observed to ensure the trustworthiness of the findings. Trustworthiness, defined as the assurance the researcher has in the research regarding its accuracy (Polit & Beck, 2021), was upheld through rigorous methodological practices and transparency in reporting. To enhance credibility, data were collected from a source which involved two FGDs. Follow-up and probing questions were used to clarify and validate participants' responses. Verbatim transcripts of the discussions were created to accurately capture participants' views. Additionally, member checking was employed to further validate the accuracy and interpretation of the data. Efforts were also made to ensure the transferability of the results by conducting FGDs with first-year nursing students who had experience in clinical settings. Diversity among participants was incorporated to capture a wide range of perspectives. A rich, detailed description of participants' responses, including direct quotes and examples was done to ensure transferability. Dependability was ensured by providing a detailed account of the research process and findings, allowing for an auditable track of the study. The research aimed to gain a better understanding of the perceptions of first-year student nurses regarding their role in caring for PLHIV, with thorough probing to elicit comprehensive responses. Confirmability, which relates to the objectivity and neutrality of the research data, was achieved by maintaining reflexivity through continually reflecting on the researcher's own biases, assumptions, and preconceptions throughout the research process. Furthermore, an audit trail was created in order to allow for transparency and scrutiny of the research process.

2.6. Ethical considerations

This study obtained ethical approval from the Ethics Committee of University of Pretoria, with a clearance number 510/2019. The researcher clearly communicated to participants that their involvement in the study was entirely voluntary, with no consequences for refusal to participate. Informed consent procedures were followed, explaining the purpose of the study, the procedures involved, and the rights of participants, including their right to withdraw from the study at any time without penalty. Additionally, participants were assured of confidentiality and anonymity to minimize any fear of repercussion for their responses. Participants engaged in an open dialogue, highlighting the significance of providing honest feedback. They were reassured that there were no correct or incorrect responses. Participants were reminded of their right to withdraw at any point during the discussions.

3. Results

3.1. Characteristics of the participants

As presented in Table 1, the participants in this study included 18 first-year students, with a gender distribution of 12 females (66.6%) and 6 males (33.4%). They all were pursuing a four-year Bachelor of Nursing program. Their ages ranged from 18 to 33 years old. This means that while they had not worked in clinical settings professionally, they may have had some exposure to clinical practices as part of their nursing education.

Table 1. Characteristics of the participants

Characteristics	Frequency	Percentage %
Gender		
Female	12	66.6
Male	6	33
Level of education		
Grade 12	18	100
Other	-	-
Age (years)		
18	3	17
19	8	44
20	5	28
22	1	6
33	1	6

Figure 1 shows the major themes and subthemes obtained from the data analysis in this study. The themes and subthemes reflect the perceptions and experiences of first-year nursing students regarding their role in caring for PLHIV, including: (1) students' unpreparedness in their role to care for PLHIV, (2) disclosure practices and student safety concerns, (3) personal backgrounds and attitudes towards PLHIV care, and (4) physical and psychological wellbeing of students while caring for PLHIV.

3.2. Theme 1: Students' unpreparedness in their role to care for PLHIV

It is evident from the participants' perspectives that they felt inadequately prepared to fulfil their role in caring for PLHIV in clinical settings. Despite being tasked with basic nursing care responsibilities, such as bed making and vital observations, they expressed a sense of unpreparedness specifically when it came to caring for PLHIV. While they acknowledged having learned about HIV/AIDS in the classroom and gaining some information from high school and their communities, they believed it was insufficient in adequately equipping them for their responsibilities.

Furthermore, the participants also perceived inadequacy in their clinical roles, emphasizing the need for comprehensive education and training before engaging in clinical practice. The analogy of going to war without a weapon highlighted the importance of being adequately equipped with knowledge and skills to handle care involving PLHIV, suggesting a sense of vulnerability among students who felt unprepared. Participants stated the following:

> *The procedures I feel that we can still continue with the procedures even if they involve body fluids, but we need to be educated fully before we go into clinical practise and before we get exposed to all of these things; it's like how can you go to war without a weapon".* (Male FDG1, 19 years old)
>
> *The information that they gave me like to me it was not enough so I had just had to go with the procedures because they are telling us that we have to go to the hospital, I cannot tell them that I am not ready".* (Female FDG1, 19-year-old)

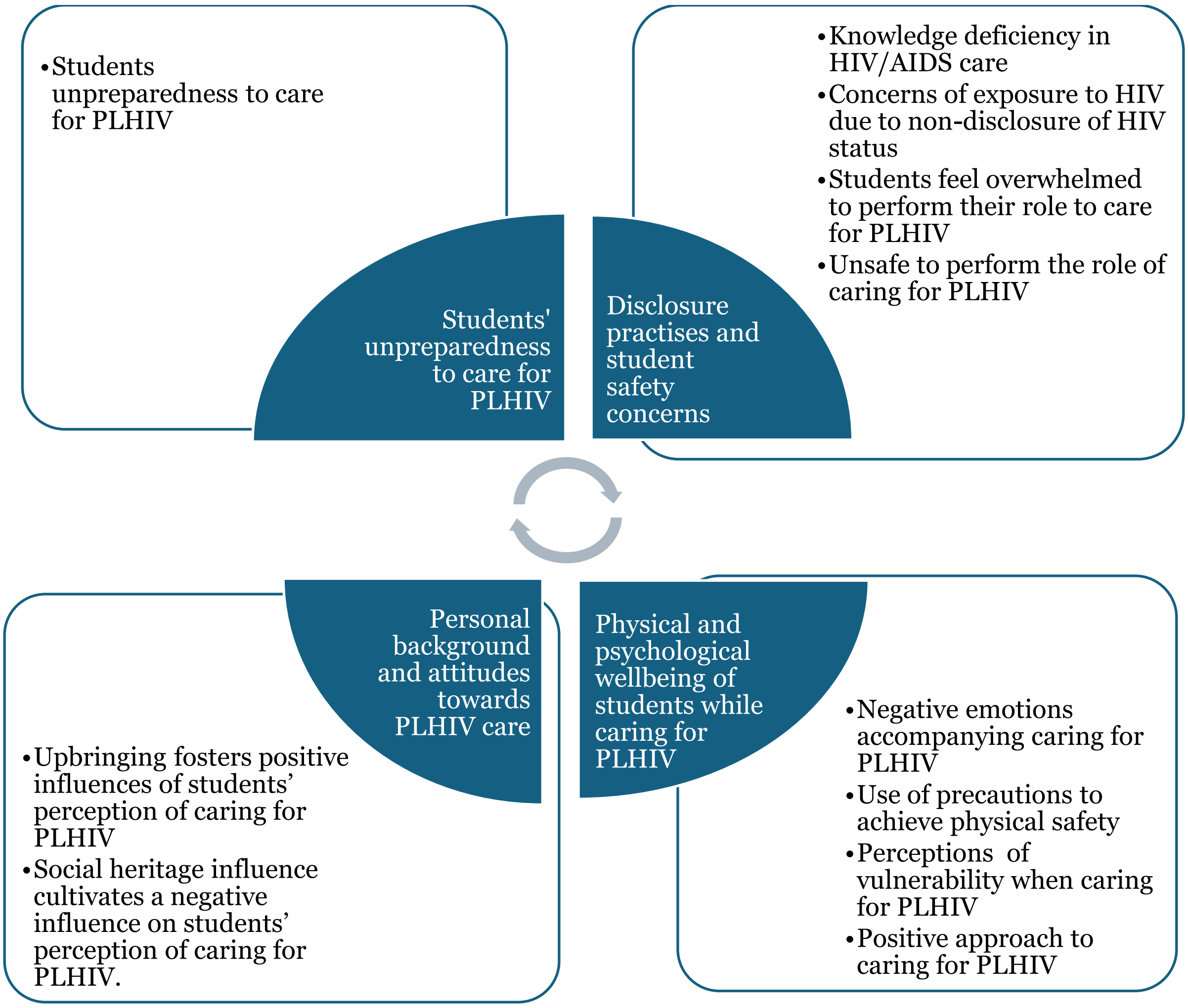

Figure 1. Presentation of themes and subthemes of the study

3.3. Theme 2: Disclosure practices and student safety concerns

The second theme highlights the lack of disclosure regarding the HIV status of patients to first-year nursing students, which resulted in negative emotions and challenges in fulfilling their roles in caring for PLHIV. The quotes below illustrate students' experiences who were unaware of the HIV status of patients they were assigned to care for, and how this lack of information affected their ability to perform their roles effectively: "*It would help if they told us about the status of the patients, so we know how to protect ourselves"* (Male FDG1, 19 years old). This quote reflects a student's reaction upon discovering the HIV-positive status of a patient they were assigned to care for. The student's response led them to avoid performing certain tasks related to the patient's care, such as taking blood glucose measurements. This highlights the perception of lack of disclosure which resulted in lack of confidence and willingness of nursing students to engage in patient care, particularly when it involves PLHIV.

Furthermore, another participant also stated: *"How can they expect us to be comfortable in nursing the people who we do not know the status"* (Female FDG2, 20 years old). This emphasises the frustration and confusion experienced by students when they realized that senior nurses were avoiding certain patients, only to later discover that it was due to their HIV-positive status. This exacerbated negative perceptions and emotions among nursing students towards PLHIV possibly compromising the quality of care provided to those patients.

3.3.1. Subtheme 1: Knowledge deficiency in HIV/AIDS care

This subtheme focuses on the lack of knowledge among participants specifically concerning the care of PLHIV. Participants expressed concerns about the inadequacy of lectures in providing guidance on care for patients with HIV/AIDS, leading them to rely on misconceptions inherited from their backgrounds. The quote provided below highlight students' perceptions of insufficient education on HIV/AIDS care, which may result in anxiety and fear, particularly regarding the risks associated with handling body fluids. The quote stated: *"I knew very well if I was going to take the temperature without gloves I could contact the sweat and be exposed to the virus"* (Female FDG1, 20 years old).

3.3.2. Subtheme 2: Students' concerns of exposure to HIV due to non-disclosure of HIV status of the patient while performing their role

This subtheme highlights the concerns expressed by first-year nursing students regarding their potential exposure to HIV due to the lack of disclosure of the patient's HIV status. Participants emphasized the importance of knowing the HIV status of patients before performing nursing duties to ensure proper precautions are taken to prevent exposure to HIV. A participant stated: *"It concerns me when I think that I could have been infected when taking the blood glucose of the patient, I only found out later about the HIV"* (Female FDG1, 19 years old). This quote reflects the participants' anxiety about potential exposure to HIV while performing tasks such as taking the blood glucose of a patient whose HIV status was not disclosed beforehand. This uncertainty about the patient's HIV status can lead to heightened fear and concern among nursing students, impacting their ability to provide care effectively.

Furthermore, another participant mentioned: *"We will get infected because now we don't know if the person has it and we are busy making their beds with no gloves"* (Male FDG2, 22 years old). This quote reflects the perceived risk of exposure to HIV among nursing students when performing tasks such as making beds without wearing gloves, particularly in the absence of knowledge about the patient's HIV status.

3.3.3. Subtheme 3: Students feel overwhelmed to perform their role to care for PLHIV

This subtheme highlights the emotional and psychological impact experienced by first-year nursing students upon learning that they were caring for PLHIV. Participants described feeling overwhelmed by emotions and uncertainty, which hindered their ability to effectively perform their roles in caring for PLHIV in the clinical facility. A participant stated*: "It concerns me when I think that I could have been infected when taking the blood glucose of the patient, I only found out later about the HIV"* (Female FDG1,20 years old). This shows a participant's concern about potential exposure to HIV while performing nursing tasks, reflecting the heightened anxiety and fear experienced upon learning about the patient's HIV status. Another participant also stated:

> *Like from school like we learned that like a person living with HIV is just like you and me but since we came to university, it's like; "arrrgggghhhh", this thing and going to the hospital and actually facing the thing was like overwhelming… It is better when they tell you from the beginning, I mean the status.* (Female FDG1, 20 years old)

The above quote captures the sentiment of being overwhelmed upon facing the reality of caring for PLHIV in a clinical setting. Despite learning about HIV/AIDS in school, participants described feeling a sense of shock and disbelief when confronted with the actual experience in the hospital. This highlights the disparity between theoretical knowledge and real-world practice, contributing to feelings of overwhelm and uncertainty.

3.3.4.Subtheme 4: Students feel unsafe to perform their role in caring for PLHIV

This subtheme highlights the perception of first-year nursing students that it is unsafe for them to perform their roles in caring for PLHIV. This perception stems from various factors, including insufficient knowledge about the virus and its transmission, the stigma associated with HIV/AIDS, and a fear of contracting the virus, as stated by the participants below:

> *Like you know what if you catch it (HIV) then your life's going to change like, as the society is seeing this epidemic like that's the disease that you're going to get and then your life is going to change and then you're gonna die and everything."* (Male FDG2, 20 years old)

> *I also know that I wouldn't be comfortable treating them (PLHIV) coz I would also be afraid that I will contract the virus because even though we know that it is transmitted through body fluids, but we grow up with stereotype that HIV people are not safe."* (Female FDG1, 18 years old)

The first quote reflects the fear of the unknown and the perceived consequences of contracting HIV. Participants expressed concerns about how their lives would change if they were to become infected, reflecting broader societal fears and misconceptions surrounding HIV/AIDS. The second quote denoted the influence of societal stereotypes and stigma on the perception of safety when caring for PLHIV. Despite theoretical knowledge about HIV transmission, participants described feeling uncomfortable and afraid when tasked with caring for PLHIV, highlighting the pervasive impact of stigma and fear on their attitudes and behaviors.

When allocated to care for PLHIV, participants experienced psychological and emotional distress, leading them to employ compensatory mechanisms to address fears. This included using gloves during procedures and avoiding certain tasks perceived to increase their risk of exposure to HIV/AIDS. A participant stated:

> *I would focus on the precaution measures that would take, when we are doing procedures that or things on those patients (PLHIV) they give us those unsterile gloves and that's not right. Like if you have an accident, it's possible to get a spillage of fluids which will that expose us.* (Male FDG1, 20 years old)

3.4. Theme 3: Personal backgrounds and attitudes towards PLHIV care

The third theme explores the factors that influence the perceptions of first-year nursing students when caring for PLHIV. One significant factor is the influence of the students' backgrounds and upbringing, which shape their attitudes and behaviors towards PLHIV. Participants in this study stated:

> *I came across a person with HIV when I was in primary school, I think I was in grade 3 or she was a friend, and she would always tell don't seclude or make me uncomfortable in a certain way so when I came across a patient had the virus, I didn't want to make them uncomfortable.* (Female FDG2, 18 years old)

> *My mum always talked down relatives with HV so for me HIV was a no-go area I would not even want to touch anyone with HIV or whom I suspect has it.* (Male FDG1, 20 years old)

The first quote illustrates how personal experiences from childhood can impact the way nursing students perceive and interact with PLHIV. In this case, the participant recounted a positive experience with a person living with HIV during their primary school years. This encounter left a lasting impression, instilling empathy, and a desire to treat PLHIV with dignity and respect. Conversely, the second quote highlights the influence of family attitudes and beliefs on the participant's perception of PLHIV. Growing up in an environment where HIV was stigmatized and viewed negatively, the participants adapted these sentiments, leading to reluctance when faced with the role of caring for PLHIV in the clinical setting.

3.4.1. Subtheme 1: Upbringing fosters a positive influence of students' perception of caring for PLHIV

This subtheme highlights how early exposure and positive experiences with PLHIV can shape nursing students' attitudes and perceptions towards caring for individuals living with HIV. Participants stated: *"No, I didn't feel a different way like I said with the first patient that I worked with, she made me feel comfortable, so I didn't feel indifferent"* (Female FDG2, 19 years old), *"My aunt was HIV positive, we used to help her around so when I came to the wards, I was very comfortable because it was not something new"* (Male FDG 2, 19 years old). Another participant mentioned:

> *We grew up with a girl that was HIV-positive, and she was not different from us, so coming across someone that had it in the hospital it was like any other patient with any other condition, nothing special really."* (Female FDG1, 18 years old)

The quotes provided illustrate how personal experiences within the participants' families or communities have positively influenced their perceptions of PLHIV. For example, one participant mentions growing up with a family member who was HIV-positive and recalls assisting them without feeling any different or stigmatizing them. This experience normalized HIV for the participants, allowing them to approach caring for PLHIV in the clinical setting with confidence and empathy. Similarly, another participant shares how their upbringing, which involved interacting with a friend or relative who was HIV-positive, contributed to their comfort and familiarity with PLHIV. These early experiences gave a sense of acceptance and understanding, ensuring the participants viewed PLHIV as individuals requiring equal care and respect, without discrimination or prejudice.

3.4.2.Subtheme 2: Social heritage influence cultivates a negative influence on students' perception of caring for PLHIV

This subtheme highlights how negative societal attitudes and misconceptions surrounding HIV/AIDS can adversely impact nursing students' perceptions and attitudes towards PLHIV. Participants stated:

> *Society where we come from most of the time contributes our thoughts and our mind-set, how these people are treated that's what we come with to the hospital for example where I come from people who are HIV positive are isolated from the rest of the people. So, when I come I come with the ideology in the hospital that I have to isolate myself from that patient and I have to isolate other patients from them as they might be HIV positive."* (Female FDG1, 18 years old)

> *I also know that I wouldn't be comfortable treating them (PLHIV) coz I would also be afraid that I will contract the virus because even though we know that it is transmitted through body fluids, but we grow up with stereotype that HIV people are not safe."* (Female FDG1, 19 years old)

The quotes provided shows how societal norms and cultural beliefs, particularly those in stigma and discrimination, influence the participants' perceptions of PLHIV. For instance, one participant mentions how societal attitudes in their community involve isolating individuals living with HIV/AIDS, which they bring into the hospital setting. This belief result in feelings of discomfort and reluctance to interact with PLHIV, reflecting a negative perception of caring for them. Similarly, another participant expresses fear in caring for PLHIV due to the stigma associated with the virus. Despite knowing HIV transmission, the participant acknowledges that societal stereotypes and misconceptions about the safety of interacting with PLHIV contribute to their discomfort and reluctance to provide care.

3.5. Theme 4: Physical and psychological wellbeing of students while caring for PLHIV

This theme highlights the diverse range of experiences and perceptions that first-year nursing students encounter when providing care for PLHIV. These experiences can significantly impact their physical and mental well-being, influencing their ability to perform their clinical roles effectively.

3.5.1. Subtheme 1: Negative emotions accompanying caring for PLHIV

This subtheme highlights the emotional challenges that first-year nursing students face when providing care for PLHIV. These negative emotions stem from a combination of factors, including misinformation, lack of knowledge, and personal biases. A participant stated: *"I would be uncomfortable to work with that patient (PLHIV) and what mum would say to me would actually come to my mind and it would make me scared* (Female FDG2, 20 years old). Similarly, another participant mentioned:

> *Like caring for a patient is who is HIV positive to me is not an easy thing for me to do, most of the time I'm not feeling comfortable and safe around them based on their symptoms they present with such as rapid weight loss, fever, flu, so they make me uncomfortable especially when it comes to body fluids as you know HIV it can be transmitted through only body fluids.* (Female FDG2, 33 years old)

The quotes provided illustrate how some students feel uncomfortable and uneasy when caring for PLHIV due to misconceptions and fear surrounding HIV. For instance, one participant expressed discomfort around patients with HIV/AIDS, stating symptoms such as rapid weight loss as factors that made them uncomfortable. Another participant mentioned feeling scared and recalling negative messages from family members, which increased their fear and anxiety. These responses highlight the importance of addressing misconceptions and providing accurate education about HIV/AIDS to nursing students. By equipping students with the knowledge and understanding necessary to provide proper care, educators can help to lessen negative emotions and promote confidence in students' ability to care for PLHIV.

3.5.2. Subtheme 2: Use of precautions to achieve physical safety

This subtheme highlights how first-year nursing students adopt extra precautions when caring for PLHIV to protect themselves from potential exposure to the virus. This increased their sense of caution caused by awareness of the patient's HIV status and the perceived risk of contracting the disease, as stated by the following participants:

> *Yes, it feels very differently when you know that the person has the virus you come in with the mind of, I need to guard every corner and every move that I make right now in order to also protect myself because the first thing that you are taught is that your protection is important.* (Male FDG2, 19 years old)
>
> *Others coz you cannot really, really treat them the same in other instances because of the precaution you need to take over the person without the virus and a person with the virus.* (Female FDG1, 18 years old)

The quotes above provided illustrate how students approach care differently when they know that the patient is living with HIV. They express the need to be extra careful in their actions to minimize the risk of exposure to body fluids and possible transmission of the virus. Students however might become too cautious or hesitant during their care for these patients, resulting in compromised quality of care and patient outcomes. Additionally, it might contribute to feelings of stigma and discrimination experienced by PLHIV, further increasing existing challenges in healthcare delivery. Educators and clinical preceptors need to address these concerns and provide guidance to students on appropriate infection control measures while also emphasizing the importance of delivering compassionate and non-discriminatory care to all patients, regardless of their HIV status.

3.5.3. Subtheme 3: Perception of vulnerability when caring for PLHIV

This subtheme highlights the sense of vulnerability experienced by first-year nursing students when tasked with duties beyond their scope of practice, particularly in the context of caring for PLHIV. These students expressed feeling intimidated by qualified nursing staff, who often assigned them tasks outside their level of training and experience. A participant mentioned:

> *.....because you are first year nurse they'll tell you to do specific things for them (senior nurses) because they don't want to do them and sometimes those are out of your scope and if you don't do it then you really like you can get like shouted at and everything so you're in a vulnerable position as a first year so then you'll do certain things that will obviously put you at a greater risk and expose you more.* (Male FDG2, 20 years old)

The first-year nursing students felt that the senior nurses influenced them as novice students, forcing them to perform tasks that may not adhere to their level of competency or training. This made the students attain a sense of vulnerability and insecurity in their role as caregivers. This environment fostered a sense of unpreparedness and fear to care for PLHIV due to their vulnerable status.

3.5.4. Subtheme 4: Positive approach to caring for PLHIV

This subtheme indicates that familiarity with PLHIV, either through personal encounters or prior education, contributed to these students' positive outlook. The students perceived normally that caring for PLHIV was not different from caring for patients with other conditions. Instead of feeling fearful or anxious, these students approached their duties normally. They were aware of the necessary precautions to prevent exposure to blood and body fluids felt a sense of preparedness and completed their role in caring for PLHIV. Participants stated:

> *When I became aware of it nothing changed it was just like ok so now, I'm aware of this I need to be slightly more cautious but it was just like another patient because you won't change the way you take the temperature pin from a patients mouth you will still hold the tip cause not one actually wants to touch anyone's spit (giggles). So, for me nothing clearly changed.* (Male FDG2, 19 years old)
>
> *I don't think you feel more uncomfortable, but I think you feel more like safe in a sense because I knew oh this is what you're supposed to do if it happens if you get blood on you this is where you're supposed to go.* (Female FDG1, 22 years old)

4. Discussion

The study aimed to investigate the perceptions and experiences of first-year nursing students regarding their role in caring for people living with HIV (PLHIV) in a clinical setting. Through focus group discussions and qualitative content analysis, several themes and subthemes emerged, shedding light on the experiences and attitudes of these students.

4.1 Students' unpreparedness to care for PLHIV

The current study sheds light on first-year nursing students' perceptions of being ill-prepared to care for PLHIV, citing inadequate training and knowledge acquisition. This finding echoes with a previous study conducted by Rana and Cheung (2019), which emphasizes the critical role of comprehensive HIV/AIDS education in nursing curricula. However, Ngcobo and Mchunu (2019) argue that practical training and the provision of protective gear are important to allay students fears of contagion, providing a practical aspect to the discussion. Moreover, the issue of disclosing patients' HIV status emerged as a significant concern among participants, leading to feelings of insecurity and fear. This finding aligns with the findings of Dong et al. (2018), who advocate for disclosing patient HIV status to prevent accidental exposure and enhance students' confidence in providing care. However, Salvadori and Hahn (2019) highlighted the importance of medical confidentiality in the care of patients with HIV/AIDS.

This study also highlighted the psychological and emotional challenges experienced by many participants while caring for PLHIV, leading to resorting to protective measures and avoidance behaviors. This finding aligns with research by Pickles et al. (2009), which highlights similar fears and concerns among nursing students globally. Further exploration could compare coping strategies and support mechanisms employed by students in different settings, informing interventions to promote students' well-being in clinical settings. To deepen the analysis, it is essential to consider insights from studies conducted over the past few years. For instance, Shi and Cleofas (2023) identified gaps in knowledge and skills among student nurses regarding HIV/AIDS care, stressing the need for intensive education and training programs. Moreover, Mikkonen et al. (2022) emphasized the importance of clinical mentoring and support for student nurses during their clinical placements, which can significantly enhance students' competencies and confidence in providing care for PLHIV. Additionally, Atav et al. (2015) explored the attitudes and perceptions of nursing students towards PLHIV, highlighting the need to address misconceptions and negative attitudes through education and training programs. By synthesizing findings from these studies, researchers can develop comprehensive solutions to improve care for PLHIV, addressing educational gaps, policy challenges, and cultural influences. This holistic approach is crucial for enhancing nursing education and practice in the context of HIV/AIDS care.

4.2 Disclosure practices and student safety concerns

First-year nursing students were of the perception that they were not given a full report when it came to the status of PLHIV. They perceived that the senior nursing staff omitted divulging the status of the patient. Literature review states that concealing HIV status in the medical settings was discovered to be associated with concerns about contravention of confidentiality, denial of quality medical care and judgment from health care providers (Dudina et al., 2020). The current study reveals a lack of disclosure of patients' HIV status to first-year nursing students, leading to feelings of insecurity and fear among students. This finding relates with Soler et al. (2021), who highlights the importance of disclosing patient information, including HIV status, to ensure the safety and confidence of healthcare professionals. However, the study by Soler et al. (2021) focuses on nurses rather than nursing students, noting a gap in research on disclosure practices specifically concerning student education and safety.

Medical information is confidential and, even more importantly, HIV-related information is more classified hence surplus protection has been afforded to HIV-related medical records (Hlongwa, 2016). As a result, it is not permissible to release HIV information randomly without permission; however, exceptions have been made for healthcare providers to divulge a patient's HIV infection to people at risk of infection without offence (Hlongwa, 2016). The senior health careers, therefore, have a duty to decide if it if is beneficial to disclose the status of the patient to the students (Vaismoradi et al., 2020). It may be helpful for other medical health workers to make known to the first-year nursing students the status of the patient where implicated without violating their rights to privacy or compromising the quality of care rendered to them. Moreover, this may assist in addressing their anxieties and fears of contagion and improve the perceptions of their role in the care they provide to PLHIV. On the other hand, the role of first-year nursing students in clinical facilities involves less invasive procedures. Subsequently, it may not be necessary to divulge the status of the patient as it may not be implicated in the required care treatment they offer to the patient but instead, it may result in negative implications such as stigma (Shah et al., 2014).

Involving the first-year student nurse in holistic care in the clinical facilities will enable them to develop a sympathetic clinical experience which will improve their transition into practice. Moreover, mentorship will enhance their socialisation into the profession with added accountability and responsibility which will create self-confidence in taking their roles in caring for PLHIV. Education and mitigation of safe practices within the healthcare system, as well as the use of recommended guidelines will lead to optimal patient outcome (Gazaway et al., 2019). Failure of these practices will create fear in the first-year student nurses of contracting HIV which will delay the healing outcomes of PLHIV and create overcrowding of patients in the health facilities.

The health care workers in the clinical facilities should involve the first-year nursing students in the holistic care of the patient so that they do not become fearful of nursing any patients and become accustomed to necessary precautions that should be taken when caring for all patients, especially when performing invasive procedures (Gularte-Rinaldo et al., 2023). In their role of caring for the patients, they need to be reminded of the rights of the patient, especially on HIV legislation including internal and external work policies on HIV/AIDS which will speak to them on why sometimes the status of the patient may be withheld (Kupcewicz et al., 2021). Senior healthcare workers should be trained on mentorship so that when the first-year students are in the clinical setting, mentorship can be assumed by the qualified healthcare staff. Moreover, first-year nursing students need to be made aware of safe practices so that they treat every patient with caution and care to prevent any nosocomial infections. Emphasis must be made on utilising standard guidelines for infection control (Chang et al., 2023).

4.3 Personal backgrounds and attitudes towards PLHIV care

Some of the first-year nursing students have prior knowledge about either a relative or friend who had been diagnosed with HIV previously. This led the students to either have a negative or positive perception of PLHIV when they had to perform their role in caring for PLHIV. Fear of contagion was coupled with erroneous beliefs about HIV transmission, leading to negative attitudes and misinformation. Both the current study and Pickles et al. (2019) demonstrate the significant impact of personal backgrounds on attitudes towards PLHIV care. Participants with prior exposure to HIV/AIDS, either through personal experiences or close relationships, generally held more positive attitudes. Addressing culturally construed misinformation will enhance HIV/AIDS knowledge thereby empowering the first-year nursing students to perform their caring role more effectively and efficiently in a positive environment which does not entertain superstitions and beliefs. However, the inability to speak to misinformation will result in first-year nursing students developing negative attitudes towards PLHIV and resulting in an adverse healthcare system with reduced quality care of PLHIV and a poor prognosis.

This study also showed the influence of personal backgrounds and prior experiences on students' attitudes towards caring for PLHIV. This aspect resonates with the findings of Pickles et al. (2017), suggesting that cultural factors significantly shape perceptions of PLHIV care. Further exploration could compare specific cultural influences across different contexts and examine the effectiveness of educational interventions in challenging negative beliefs. It is recommended that training programmes seek to investigate the student nurses' culturally construed misinformation on HIV/AIDS to prepare them with appropriate knowledge. Philip et al. (2014) reaffirm that training programs and curricula for healthcare students should generate an understanding of personal biases and prejudices toward PLHIV. A recommendation for further studies is made to explore the effects of diversities, for instance, gender, cultural values, and clinical experience on nursing students' attitudes.

4.4 Physical and psychological well-being of students while caring for PLHIV

Most participants in this study, while performing their role in caring for PLHIV, experienced many psychological and emotional challenges. They resorted to using some approaches to protect themselves, including limited contact with PLHIV, using safety clothing, and absconding from their delegated duties. The findings in this study is congruent with Pickles et al. (2019) that found significant psychological and emotional challenges faced by nursing students when caring for PLHIV. These challenges include fears of contagion, feelings of insecurity, and reluctance to provide care (Pickles et al., 2019). The present study also showed that first-year nursing students were aware of their role in caring for PLHIV, however, some felt unsafe and unprepared when given the task to perform their role in caring for the PLHIV, which is in line with a study by Bonacaro et al. (2022). Other first-year students felt that they were manipulated to care for PLHIV even if some procedures were outside their scope. However, some first-year nursing students were receptive to perform their role as they had previous encounters with PLHIV in their childhood or as their relatives. Addressing inequalities towards first-year student nurses will ensure they gain strength and adopt strategies that assist in forming an improved nursing environment (Rozendo et al., 2017). Mentoring offers a multidisciplinary approach which acquires adequate knowledge and positive attitudes during training the training of first-year student nurses. Adversely, absence of mentoring will result in negative attitudes which will have negative effects on PLHIV during their hospital stay (Zulu et al., 2021). Imparting more knowledge to first year student nurses will create more positive attitudes and weaken their personal concerns of their role in caring for PLHIV.

First-year nursing students are the basis of the nursing cadre and, therefore, need to be considered as the most important group of students which need to be carefully mentored and given the right information before being assigned their role in clinical duties. It cannot be overemphasised that there is need for intensive access to HIIV and AIDS information for first year student nurses before they assume their clinical duties to ensure that quality care is given to PLHIV (Shi & Cleofas, 2023). The clinical staff should allow forums which enable student nurses to air their concerns with assurance that there will be no threats to their educational marks if they report any injustice they may be facing. First-year nursing students should be made aware of the availability of access to counsellors who may assist them to face their fears and anxiety, which will improve their patient care for PLHIV (Bøe & Debesay, 2021).

5. Implications and limitations

This study underscores the imperative for nursing education programs to integrate comprehensive HIV/AIDS care training into their curricula, ensuring students acquire essential knowledge and skills. Clinical instructors should offer robust support and mentorship to students during clinical training, fostering hands-on experience in PLHIV care. Additionally, nursing students ought to engage in ongoing professional development activities related to HIV/AIDS care, including workshops and seminars. Further research is warranted to explore nursing students' perceptions across diverse contexts and the efficacy of educational interventions on clinical practice.

While valuable, this study's findings may lack generalizability beyond the specific institution and geographic location studied. Exclusion of older nursing students could limit the diversity of perspectives. Additionally, the focus on first-year students without prior medical experience may restrict the applicability of findings to broader student populations. Future research should include diverse age groups and educational levels to enhance the comprehensiveness and relevance of findings to nursing education and practice.

6. Conclusion

In conclusion, this study highlights varied perceptions among first-year nursing students regarding their role in caring for PLHIV. While challenges such as lack of preparedness and negative emotions were evident, opportunities for improvement also emerged. Recommendations include enhancing education and training programs to cover comprehensive HIV/AIDS care, providing adequate clinical mentoring and support, encouraging continuous professional development, and promoting further research to inform evidence-based practices. By addressing these challenges and implementing targeted interventions, nursing education programs can better prepare students to provide quality care to PLHIV and contribute to improved health outcomes for this population.

Acknowledgment

The authors extend their sincere appreciation to the first-year nursing students who generously contributed their time and insights to this study. Their participation was invaluable and greatly appreciated. Additionally, the authors express gratitude to the University of Pretoria Research and Publication Committee for their support and assistance throughout the research process. Without the cooperation and support of these individuals and institutions, this study would not have been possible. Their contributions have enriched the research findings and enhanced the quality of this work.

Author contribution

RDM obtained ethical clearance for the project, conducted the literature review, collected interview data, and performed data analysis. RDM was primarily responsible for the final development of the research article. VB and HS served as the project leader, overseeing the research process.

Conflict of interest

No conflict of interest was observed whilst the research was being conducted and concluded.

References

Aggarwal, S., Lee, D.H., Minteer, W.B., Fenning, R.T., Raja, S.K., Bernstein, M. E., Raman, K. R., Denny, S. P., Patel, P. A., Lieber, M., Farfel, A. O., & Diamond, C. A. (2017). Another generation of stigma? Assessing healthcare student perceptions of HIV-positive patients in

Mwanza, Tanzania. *AIDS Patient Care and STDs, 31*(2), 87-95. https://doi.org/10.1089/apc.2016.0175

Akansel, N., Aydin, N., Özdemir, A., & Töre, O. (2012). Effects of planned HIV/AIDS education on attitudes towards AIDS in beginning level nursing students. *International Journal of Caring Sciences, 5*(1), 56-65.

Armstrong, S. J., & Rispel, L. C. (2015). Social accountability and nursing education in South Africa. *Global Health Action, 8*(1), 27879.

Atav, A. S., Sendir, M., Darling, R., & Acaroglu, R. (2015). Turkish and American undergraduate students' attitudes toward HIV/AIDS patients: A comparative study. *Nursing Forum, 50*(2), 116–124. https://doi.org/10.1111/nuf.12059

Avert, A. (2021). *HIV and AIDS in South Africa*. https://www.avert.org/professionals/hiv-around-world/sub-saharan-africa/south-africa

Bøe, S. V., & Debesay, J. (2021). The learning environment of student nurses during clinical placement: A qualitative case study of a student-dense ward. *SAGE Open Nursing, 7,* 23779608211052357. https://doi.org/10.1177%2F23779608211052357

Bonacaro, A., Stroumpouki, T., Stavropoulou, A., Triglia, C., Vizilio, E., Papageorgiou, D., & Rubbi, I. (2022). Nursing students' attitudes on caring for people living with HIV/AIDS. A European multicentre study. *Acta Bio Medica, 93*(Suppl 2), e2022191. https://doi.org/10.23750%2Fabm.v93iS2.12999

Botma, Y., Greeff, M., Mulaudzi, F.M., & Wright, S.C.D. (2018). *Research in health sciences*. Pearson South Africa.

Chang, S. O., Sohng, K. Y., Kim, K., Won, J., Chaung, S. K., & Choi, M. J. (2023). How nursing students learn infection control education through undergraduate nursing programs: A phenomenographic research study. *BMC Nursing, 22,* 297. https://doi.org/10.1186/s12912-023-01465-9

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. SAGE publications.

Dong, X., Yang, J., Peng, L., Pang, M., Zhang, J., Zhang, Z., Rao, J., Wang, H. & Chen, X. (2018). HIV-related stigma and discrimination amongst healthcare providers in Guangzhou, China. *BMC Public Health, 18,* 738. https://doi.org/10.1186/s12889-018-5654-8

Dudina, V. I., King, E. J., & Tsareva, A. V. (2020). Concealing an HIV-positive status in medical settings: Discussions in Russian online forums. *Qualitative Health Research, 30*(9), 1379–1391. https://doi.org/10.1177/1049732320914574

Gazaway, S., Gibson, R. W., Schumacher, A., & Anderson, L. (2019). Impact of mentoring relationships on nursing professional socialization. *Journal of Nursing Management, 27*(6), 1182-1189. https://doi.org/10.1111/jonm.12790

Gularte-Rinaldo, J., Baumgardner, R., Tilton, T., & Brailoff, V. (2023). Mentorship respect study: A nurse mentorship program's impact on transition to practice and decision to remain in nursing for newly graduated nurses. *Nurse Leader, 21*(2), 262-267. https://doi.org/10.1016/j.mnl.2022.07.003

Hlongwa, P. (2016). Current ethical issues in HIV/AIDS research and HIV/AIDS care. *Oral Diseases, 22,* 61-65. https://doi.org/10.1111/odi.12391

Katsinde, T. J., Katsinde, C.S., Mwale, M. (2011). Student nurses' perceptions of the HIV and AIDS problem: A case study of Bindura School of Nursing, Zimbabwe. *Journal of Sustainable Development in Africa, 13*(1), 212-226.

Kupcewicz, E., Grochans, E., Kadučáková, H., Mikla, M., Bentkowska, A., Kupcewicz, A., Andruszkiewicz, A., & Jóźwik, M. (2021). Personalized healthcare: The importance of patients' rights in clinical practice from the perspective of nursing students in Poland, Spain and Slovakia—A cross-sectional study. *Journal of Personalized Medicine, 11*(3), 191. https://doi.org/10.3390/jpm11030191

Leyva-Moral, J.M., Terradas-Robledo, R., Feijoo-Cid, M., De Dios-Sánchez, R., Mestres-Camps, L., Lluva-Castano, A., & Comas-Serrano, M. (2017). Attitudes to HIV and AIDS among students and faculty in a school of nursing in Barcelona (Spain): A cross-sectional survey. *Collegian, 24*(6), 593-601. https://doi.org/10.1016/j.colegn.2016.10.006

Marranzano, M., Ragusa, R., Platania, M., Faro, G., Coniglio, M. A. (2013). Knowledge, attitudes and practices towards patients with HIV/AIDS in staff nurses in one university hospital in Sicily. *Epidemiology Biostatistics and Public Health, 10*(1), e8731. https://doi.org/10.2427/8731

Mikkonen, K., Tomietto, M., Tuomikoski, A. M., Miha Kaučič, B., Riklikiene, O., Vizcaya-Moreno, F., Pérez-Cañaveras, R. M., Filej, B., Baltinaite, G., Cicolini, G., & Kääriäinen, M. (2022). Mentors' competence in mentoring nursing students in clinical practice: Detecting profiles to enhance mentoring practices. *Nursing Open, 9*(1), 593–603. https://doi.org/10.1002/nop2.1103

Mills, E. J., Bakanda, C., Birungi, J., Chan, K., Ford, N., Cooper, C. L., Nachega, J. B., Dybul, M., & Hogg, R. S. (2011). Life expectancy of persons receiving combination antiretroviral therapy in low-income countries: A cohort analysis from Uganda. *Annals of Internal Medicine, 155*(4), 209-216. https://doi.org/10.7326/0003-4819-155-4-201108160-00358

Ngcobo, S.J., & Mchunu, G.G. (2019). Bachelor of nursing students' HIV and AIDS knowledge in KwaZulu-Natal province: An evaluation study. *Curationis, 42*(1), e1-e11. https://doi.org/10.4102/curationis.v42i1.1928

Pervaz Iqbal, M., Manias, E., Mimmo, L., Mears, S., Jack, B., Hay, L., & Harrison, R. (2020). Clinicians' experience of providing care: A rapid review. *BMC Health Services Research, 20*(1), 952. https://doi.org/10.1186/s12913-020-05812-3

Philip, J., Chadee, D., & Yearwood, R. P. (2014). Health care students' reactions towards HIV patients: Examining prejudice, emotions, attribution of blame and willingness to interact with HIV/AIDS patients. *AIDS Care, 26*(10), 1236-1241. https://doi.org/10.1080/09540121.2014.896449

Pickles, D., King, L., & de Lacey, S. (2017). Culturally construed beliefs and perceptions of nursing students and the stigma impacting on people living with AIDS: A qualitative study. *Nurse Education Today, 49*, 39-44. https://doi.org/10.1016/j.nedt.2016.11.008

Pickles, D., King, L., & Belan, I. (2009). Attitudes of nursing students towards caring for people with HIV/AIDS: Thematic literature review. *Journal of Advanced Nursing, 65*(11), 2262–2273. https://doi.org/10.1111/j.1365-2648.2009.05128.x

Pickles, D., Lacey, S., & King, L. (2019). Conflict between nursing student's personal beliefs and professional nursing values. *Nursing Ethics, 26*(4), 1087–1100. https://doi.org/10.1177/0969733017738132

Polit, D. F., & Beck, C. T. (2021). *Nursing Research: Generating and assessing evidence for nursing practice* (11th ed.). Wolters Kluwer.

Polit, D. F., Beck, C. T., & Hungler, B. P. (2017). *Essentials of nursing research: Appraising evidence for nursing practice* (9th ed.). Wolters Kluwer.

Rana, S., & Cheung, K. (2019). *Nursing students' knowledge of HIV/AIDS-a literature review* (Bachelor's thesis, JAMK University of Applied Sciences). https://www.theseus.fi/handle/10024/303468

Rozendo, C. A., Salas, A. S., & Cameron, B. (2017). A critical review of social and health inequalities in the nursing curriculum. *Nurse Education Today, 50,* 62-71. https://doi.org/10.1016/j.nedt.2016.12.006

Salvadori, M., & Hahn, G. V. (2019). Medical confidentiality in the care of patients with HIV/AIDS. *Revista Bioética, 27,* 153-163. https://doi.org/10.1590/1983-80422019271298

Shah, S. M., Heylen, E., Srinivasan, K., Perumpil, S., & Ekstrand, M. L. (2014). Reducing HIV stigma among nursing students: A brief intervention. *Western Journal of Nursing Research, 36*(10), 1323-1337. https://doi.org/10.1177/0193945914523685

Shi, C., & Cleofas, J. V. (2023). Student nurses' perceptions and experiences in caring for people living with HIV/AIDS: A qualitative study. *BMC Medical Education, 23*(1), 99. https://doi.org/10.1186/s12909-023-04074-x

Soler, O. M., Aguayo-González, M., Gutiérrez, S. S. R., Pera, M. J., & Leyva-Moral, J. M. (2021). Nursing students' expectations of their first clinical placement: A qualitative study. *Nurse Education Today, 98,* 104736. https://doi.org/10.1016/j.nedt.2020.104736

South African National AIDS Council. (2015). *Annual progress report.* South African National AIDS Council. https://sanac.org.za/2015/06/11/annual-progress-report-201415/

South African Nursing Council. (1984). *Regulations relating to the scope of practice of persons who are registered or enrolled under the nursing act, 1978. Regulation R. 2598.* South African Nursing Council. https://www.sanc.co.za/r-2598/

Speziale, H. S., Streubert, H. J., & Carpenter, D. R. (2011). *Qualitative research in nursing: Advancing the humanistic imperative.* Lippincott Williams & Wilkins.

Squires, A., White, J., & Sermeus, W. (2015). *Quantity, quality and relevance of the nursing workforce to patient outcomes.* ICN Policy Brief, ICN. https://doi.org/10.13140/RG.2.1.3384.0720

Vaismoradi, M., Tella, S., A. Logan, P., Khakurel, J., & Vizcaya-Moreno, F. (2020). Nurses' adherence to patient safety principles: A systematic review. *International Journal of Environmental Research and Public Health, 17*(6), 2028. https://doi.org/10.3390/ijerph17062028

Wang, Q., Cao, X., & Du, T. (2022). First-year nursing students' initial contact with the clinical learning environment: Impacts on their empathy levels and perceptions of professional identity. *BMC Nursing, 21,* 234. https://doi.org/10.1186/s12912-022-01016-8

Zulu, B. M., du Plessis, E., & Koen, M. P. (2021). Experiences of nursing students regarding clinical placement and support in primary healthcare clinics: Strengthening resilience. *Health SA Gesondheid: Journal of Interdisciplinary Health Sciences, 26,* 1615. https://doi.org/10.4102/hsag.v26i0.1615

Nurse Media
JOURNAL OF NURSING

Nurse Media Journal of Nursing
e-ISSN: 2406-8799, p-ISSN: 2087-7811
https://medianers.undip.ac.id
14(1):142-159, April 2024
https://doi.org/10.14710/nmjn.v14i1.56812

ORIGINAL RESEARCH

Development of a Holistic Nursing Model Based on Transcultural Nursing to Improve the Quality of Life of Patients with Type-2 Diabetes Mellitus

Ni Wayan Suniyadewi[1], Yuni Sufyanti Arief[1], Ninuk Dian Kurniawati[1], I Dewa Ayu Rismayanti[2], Ni Wayan Trisnadewi[3], Iswatun Iswatun[4]

[1]*Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia*
[2]*Nursing Program, Sekolah Tinggi Ilmu Kesehatan (STIKES) Buleleng Bali, Bali, Indonesia*
[3]*Nursing Program, Sekolah Tinggi Ilmu Kesehatan (STIKES) Wira Medika Bali, Bali, Indonesia*
[4]*Department of Nursing, Faculty of Vocational Studies, Universitas Airlangga, Surabaya, Indonesia*

Article Info

Article History:
Received: 27 July 2023
Revised: 26 April 2024
Accepted: 28 April 2024
Online: 30 April 2024

Keywords:
Development; holistic nursing; transcultural nursing; T2DM; quality of life

Corresponding Author:
Yuni Sufyanti Arief
Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia
Email: yuni_sa@fkp.unair.ac.id

Abstract

Background: The management of type 2 diabetes mellitus (T2DM) primarily emphasizes physical care, yet the quality of life (QoL) remains suboptimal. The management of diabetes often neglects psychological, socio-cultural, and spiritual aspects, which are essential components of transcultural nursing. Developing a holistic nursing model rooted in transcultural nursing, which has never been broadly investigated, is imperative to enhance QoL in individuals with T2DM.
Purpose: This study aimed to develop a nursing model based on transcultural nursing to enhance the QoL of individuals with T2DM.
Methods: This study employed a quantitative research design with a cross-sectional approach. A sample of 145 individuals with T2DM was recruited using a simple random sampling technique. A self-developed questionnaire was used, incorporating factors from Dossey's holistic nursing model, Leininger's transcultural nursing model, and a QoL questionnaire. Inferential statistics using smart PLS-structural equation modeling (SEM) were employed for data analysis.
Results: The findings revealed that the holistic nursing model based on transcultural nursing in individuals with T2DM was influenced directly by respondent characteristics (t=3.313, *p*=0.001), religious and life philosophy (t=2.836, *p*=0.005), social and kinship (t=2.579, *p*=0.010), cultural and lifestyle (t=2.833, *p*=0.005), biological (t=2.718, *p*=0.007), and psychological (t=2.497, *p*=0.013) factors. However, the technological factor was not significantly (t=0.802, *p*=0.423) associated with the model. The holistic nursing model based on transcultural nursing had a direct influence on the quality of life (t=9.124 and *p*=0.000).
Conclusion: The holistic nursing model based on transcultural nursing encompasses six variables: respondent characteristics, religious and life philosophy, social and kinship, cultural and lifestyle, and biological and psychological factors. The model can serve as a guideline for managing type 2 DM patients to enhance the QoL.

How to cite: Suniyadewi, N. W., Arief, Y. S., Kurniawati, N. D., Rismayanti, I. D. A., Trisnadewi, N. W., & Iswatun, I. (2024). Development of a holistic nursing model based on transcultural nursing to improve the quality of life of patients with type-2 diabetes mellitus. *Nurse Media Journal of Nursing, 14*(1), 142-159. https://doi.org/10.14710/nmjn.v14i1.56812

1. Introduction

Type-2 diabetes mellitus (T2DM) is a chronic metabolic disease characterized by hyperglycemia that occurs due to abnormalities in insulin secretion, insulin action, or both (American Diabetes Association, 2019; Perkeni, 2021). T2DM remains a global health problem with increasing incidence rates, high rates of complications, difficulty in glycemic control, and high mortality rates (Roglic, 2016; Tolossa et al., 2020; Zhou et al., 2019). In Indonesia, the challenges of managing DM are related to patients, healthcare services, and healthcare financing factors (Wibisono et al., 2021). Indonesia also has diverse geographical, cultural, and social contexts that can affect T2DM management (Perkeni, 2021). As many as 30.4% of DM patients in Indonesia are diagnosed, but only two-thirds receive treatment, and only a third have good quality of life and well-controlled glycemia (Soelistijo et al., 2019).

International Diabetes Federation (IDF) data from 2019 reported that the number of people with T2DM worldwide was approximately 463 million and is estimated to continue increasing (International Diabetes Federation, 2019). In 2021, Indonesia ranked fifth in the world for the highest number of diabetes mellitus (DM) cases, with 19.5 million DM patients (Ministry of Health, Republic of Indonesia, 2023). The increasing proportion of DM patients is also in line with the increasing problems faced by people with T2DM, such as difficulty in controlling blood glucose and low quality of life (Mamo et al., 2019). Studies have found that out of 1,967 people with T2DM in Indonesia, the majority had unsatisfactory glycemic levels with HbA1c levels of more than 7.5% (Cholil et al., 2019). Also, approximately 60% of people with T2DM in Indonesia die before the age of 60 (International Diabetes Federation, 2019). Therefore, the management of DM has become a national call to reduce this number.

Various DM management models have been implemented. However, these models focus only on physical care aspects such as medication management, blood glucose monitoring, education, physical activity, and diet management, yet glycemic control is still not optimal (International Diabetes Federation, 2019; Soelistijo et al., 2019). People with T2DM and uncontrolled glycemia require comprehensive and holistic management based on culture in all aspects of life (Ofori & Unachukwu, 2022; Soelistijo et al., 2019). Traditional culture and practices influence almost all aspects of DM management (Lagisetty et al., 2017; Sachdeva et al., 2015). Previous models did not address all aspects of life, such as biological, psychological, spiritual/belief, cultural, and social factors based on transcultural nursing to control glycemia and improve the quality of life of people with T2DM. A holistic nursing model based on transcultural nursing has never been developed and explained to improve the quality of life of people with T2DM, especially in psychological, social-cultural, and spiritual aspects.

A holistic nursing model based on transcultural nursing needs to be developed to improve the quality of life of people with T2DM. This model is developed based on Dossey's holistic nursing theory (Dossey et al., 2005) and Leininger's transcultural nursing theory (Leininger, 2002). Dossey et al.'s (2005) theory explains that the holistic care assessment aspects consist of biological, psychological, socio-cultural, and spiritual dimensions; however, nursing interventions are still very general and do not yet integrate culture in all dimensions. Meanwhile, patient beliefs regarding interventions, lifestyle patterns, and knowledge in people with T2DM are strongly influenced by culture (Sitawa & Muhati, 2016). Leininger's transcultural nursing theory can complement the weaknesses of the holistic nursing theory because it discusses a broader cultural context. Transcultural nursing theory has the advantage of focusing on cultural concepts in providing patient nursing care (Leininger, 2002). This theory examines seven aspects of cultural factors and has three decisions regarding nursing actions, namely culture care preservation, culture care accommodation, and culture care repatterning. Transcultural nursing is a theory that can be used to identify determinants of T2DM because it comprehensively describes cultural diversity in daily life and nursing care (Albougami, 2016). Previous management of T2DM mainly focused on basic physical problems, yet the patients' quality of life and glycemic control were still poor (Soelistijo et al., 2019). Accordingly, this study was conducted to develop a holistic nursing model based on transcultural nursing principles to improve the quality of life of people with T2DM.

2. Methods

2.1. Research design

This study employed a quantitative research design with a cross-sectional approach. Data were collected without any interventions on the samples. The study aimed to develop a holistic nursing model based on transcultural nursing. The model development process commenced with a literature review, preparation of instruments for variables including characteristics, technology, religion, and philosophy of life, social and kinship, cultural values and lifestyle, biological and psychological factors, holistic protection, and quality of life for individuals with T2DM. Validity and reliability tests were conducted on the instruments, followed by data collection, analysis using SEM PLS, and focus group discussions involving 11 noncommunicable disease program holders, five health cadres, and five individuals with T2DM. Expert consultations were carried out with internal medicine specialist doctors and endocrine consultants based on strategic issues and PLS analysis results. Subsequently, a holistic care model based on transcultural nursing was finalized, and modules for this model were compiled.

2.2. Setting and samples

The study population consisted of 428 individuals with T2DM. Samples were drawn from 145 people with T2DM receiving primary health care across all public/primary health centers in Denpasar City, Bali, Indonesia, using purposive sampling techniques. This research was conducted in Denpasar City due to its status as the area with the second-highest prevalence of T2DM in Bali Province, Indonesia. The majority of individuals with T2DM in Denpasar were not yet under control and had HbA1C levels ≥7.5% (Bali Provincial Health Office [Dinas Kesehatan Provinsi Bali], 2017). When employing sample collection techniques for SEM analysis, the recommended range is between 100 to 200 or a minimum of five times the number of indicators and a maximum of ten times the number of indicators to achieve a larger effect size (Hair et al., 2019). Since there were 29 parameters, the sample size was 29 x 5 = 145 people with T2DM.

The inclusion criteria were individuals who had been diagnosed with T2DM for at least 12 months; did not have complications such as kidney failure, diabetic foot, hypertension, or stroke; aged between 30 and 65 years old; were able to read and write; were cooperative; and were receiving oral antidiabetic therapy. Meanwhile, the exclusion criteria were individuals who were receiving insulin injections or were not receiving any treatment. Researchers recruited samples from 4 primary healthcare facilities based on sub-districts and selected the primary health center with the highest number of visits from T2DM patients. Researchers then selected 37 patients with T2DM based on the inclusion criteria from each health center.

2.3. Measurement and data collection

All questionnaires, except the quality of life questionnaire, were developed by the researchers themselves because they were integrated based on factors from Dossey et al. (2005)'s holistic nursing model and Leininger's (2002) transcultural nursing model. These questionnaires were developed by creating a blueprint of questions, determining the information needed to answer the research questions, structuring the questionnaire, creating a scoring system, conducting a pilot test of the questionnaire, and revising the items that were found to be invalid and unreliable, then conducting another pilot test. The content validity of these questionnaires was tested by the experts with a content validity index (CVI) ranging from 0.89 to 0.95. The quality of life questionnaire was based on the WHOQOL BREF. This questionnaire has been translated into the Indonesian language. The validity and reliability tests of all questionnaires were conducted by providing all questionnaires to 30 predetermined respondents. Each patient was given 40 minutes to complete the instrument. After the respondents filled out the instrument, the researcher reviewed the completeness of the responses, input the data, and analyzed it. The questionnaires comprised the study's variables, including respondent characteristics (X1), technological factors (X2), religious and life-philosophical factors (X3), social and kinship factors (X4), cultural and lifestyle factors (X5), biological factors (X6), psychological factors (X7), holistic nursing based on transcultural nursing (X8), and quality of life (Y1).

Respondent characteristics consist of eight question items about age, gender, education level, employment, income, marital status, family type, and health insurance. Technological factors (X2) were composed of indicators of knowledge of self-blood sugar checks and the use of telehealth. The question items on the instrument for knowledge about blood glucose testing were developed based on a theoretical review of the blood glucose testing concepts from the Indonesian Endocrinology Association and Leininger's (2002) transcultural concepts. The telehealth instrument was developed based on the instrument from Ade et al. (2011). The Knowledge of Self-Blood Sugar Checks questionnaire consisted of 10 questions. A correct answer received a score of 2, while an incorrect answer received a score of 1. The researcher then multiplied the item scores by 5 to obtain a total score, resulting in scores ranging from 10 to 100 on an interval data scale interpreted as the higher the score, the better the knowledge. All items were favorable. The validity scores ranged from 0.531 to 0.881, while the reliability score was 0.916. The telehealth questionnaire consisted of 10 favorable items, scored as follows: 1 for never, 2 for rarely, 3 for often, and 4 for always. The resulting scores range from 10 to 40 on an interval data scale, with the higher the score, the better the use of technology. The validity score ranged from 0.445 to 0.881, and the reliability score was 0.890.

Religious and life philosophy factors (X3) consisted of indicators of religiosity and the meaning of life. The questionnaire was developed based on the variables from holistic care by Dossey et al. (2005) and transcultural variables from Leininger (2002). The religiosity questionnaire contained

15 items, with 13 favorable items and 2 unfavorable items, while the meaning of life questionnaire contained 10 items, including 9 favorable items and 1 unfavorable item. Favorable responses were scored as follows: 1 for strongly disagree, 2 for disagree, 3 for neither or doubt, 4 for agree, and 5 for strongly agree. For unfavorable items, the scoring was reversed. The religiosity questionnaire scores ranged from a minimum of 15 to a maximum of 60, the higher the score, the better the religiosity. The validity test results ranged from 0.463 to 0.804, and the reliability test results were 0.862. Meanwhile, the scores of the meaning of life questionnaire ranged from 10 to 50, interpreted the same as religiosity. Its validity score was 0.515 to 0.788, with a reliability score of 0.889.

Social and kinship factors (X4) consisted of family support indicators. The family support questionnaire contained 15 items and was structured into four dimensions. The first dimension was informational, consisting of favorable items in questions 1, 2, and 3. The second dimension was emotional, including favorable items in questions 4, 5, and 7, and an unfavorable item in question 6. The third dimension was appraisal, consisting of four favorable items (8, 9, 10, 11), and the fourth dimension was instrumental, with favorable items in questions 12, 14, and 15, and an unfavorable item in question 13. Favorable responses were scored as follows: 4 for always, 3 for often, 2 for rarely, and 1 for never, while unfavorable questions were scored inversely. The scores of the family support questionnaire ranged from a minimum of 15 to a maximum of 60, with the higher the score, the better the family support. Its validity score ranged from 0.387 to 0.905, with a reliability score of 0.940.

Cultural and lifestyle factors (X5) consisted of three indicators: lifestyle based on culture, perception of T2DM based on culture, and perception of complementary therapy (*Usadha Bali*). The questionnaire was developed based on the variables from holistic care by Dossey et al. (2005) and transcultural variables from Leininger (2002). The first indicator, a lifestyle based on culture, contained 10 items, with 7 favorable and 3 unfavorable items. The second indicator, perception of T2DM based on culture, consisted of 10 items, with six parameters: consequences (1 item), timeline (1 item), personal control (1 item), treatment control (2 items), concern (1 item), and causal (4 items). Favorable items of this indicator were 1, 2, 3, 4, 5, and 7, while unfavorable items were 6, 9, and 10. The third indicator, perception of complementary therapy (*Usadha Bali*), consisted of 10 items, with favorable items in 2 and 8 and unfavorable items in 1, 3, 4, 5, 6, 7, 9, and 10. The scoring for favorable items was as follows: 1 for not suitable, 2 for somewhat suitable, 3 for quite suitable, and 4 for very suitable, while the unfavorable items were scored inversely. The resulting scores of the first and second indicators ranged from 10 to 40, interpreted as the higher the score, the better the lifestyle and perception based on culture. The validity and reliability scores of the first indicator were 0.396 to 0.813 and 0.743, respectively, while the validity score of the second indicator was 0.386 to 0.684 with a reliability score of 0.756. The third indicator scores ranged from 20 to 100, and the higher the score, the better the perception of complementary therapy *(Usadha Bali)*. The validity and reliability scores of this third indicator were 0.376 to 0.816 and 0.721, respectively.

Biological factors (X6) consisted of nutritional status as measured by body mass index and the duration of the patient's suffering from T2DM. The questionnaire items consisted of only 2 items. Psychological factors (X7) consisted of motivation and diabetes distress. The motivation questionnaire composed of Dossey et al. (2005)'s holistic nursing theory contained 10 questions, with 9 favorable items and 1 unfavorable item. Favorable responses were scored as follows: 1 for strongly disagree, 2 for disagree, 3 for doubtful, 4 for agree, and 5 for strongly agree, while unfavorable responses followed the inversed scoring. The scores ranged from 10 to 50, the higher the score, the better the motivation. The validity score ranged from 0.421 to 0.918, and the reliability was 0.868. The questionnaire on diabetes distress contained 10 questions adapted from the Diabetes Distress Scale (DDS) (Fisher et al., 2008). The favorable score ranged from 1 to 4, while the unfavorable score ranged from 4 to 1. A higher total score indicated increased diabetes-related distress in patients, while a lower score indicated a decrease in diabetes distress. The validity score ranged from 0.431 to 0.819, and the reliability score was 0.820.

The holistic nursing based on transcultural nursing (X8) questionnaire was composed of biological, psychological, social-cultural, and spiritual aspects from Dossey et al. (2005) and Leininger's (2002) theories. The questionnaire consisted of 25 questions: 10 items for biological aspects, 5 for psychological aspects, 5 for social-cultural aspects, and 5 for spiritual aspects. A score of 1 was assigned for a 'yes' answer and 0 for 'no'. The resulting scores ranged from 0 to 25, with a validity score of 0.613 to 0.912 and a reliability score of 0.983. Quality of life factors (Y1) consisted of physical aspects, psychological well-being, social relationships, and environment. The quality of life questionnaire was adapted based on the Indonesian WHOQOL BREF. It consisted of 25 items, with 22 favorable items and 3 unfavorable items. The scoring varies depending on the question category. The validity score ranged from 0.363 to 0.784, and the reliability score was 0.936.

The data were obtained through visits to primary health centers and home visits from January to March 2023, and data collection was conducted without any intervention. T2DM individuals were approached based on the inclusion criteria and provided with an explanation of the research aims. Those willing to participate as research respondents were given informed consent. Respondents were provided with the questionnaire to fill out themselves, which took approximately 40 minutes while being accompanied by the researcher. After completing the questionnaire, the researcher reviewed it for completeness before tabulating the data.

2.4. Data analysis

The respondent characteristics were analyzed using descriptive statistics. Inferential analysis was conducted using the Structural Equation Model (SEM PLS) with SmartPLS software. This analysis aimed to generate a fit holistic nursing model based on transcultural nursing and to address the hypotheses.

2.5. Ethical considerations

The study was carried out following an approved ethics protocol, with all respondents giving their consent to participate. The respondents were informed about the study, including its aim, procedures, and benefits. They were treated fairly throughout the study, and their names were not written on the questionnaire during data collection. Ethical approval for the study was obtained from the Health Research Ethics Committee of the Faculty of Nursing, Universitas Airlangga, with reference number 2721-KEPK, dated 15 December 2022. Data confidentiality was maintained by storing the completed questionnaires in a closed folder managed by the researchers

3. Results

3.1. Respondent characteristics

Table 1 shows that out of 145 respondents, the majority were aged between 46 and 65 years old (93.8%), female (51.7%), and had secondary education (49.7%). Additionally, a significant portion did not work or were housewives (42.1%), had high family income (40.7%), were married (87.6%), lived with a nuclear family (51.7%), and had health insurance (84.1%). %). The results of the characteristics of the respondents are displayed in Table 1

Table 1. Characteristics of the respondents (n=145)

Characteristics	f	%
Age		
30-45 years old	9	6.2
46-65 years old	136	93.8
Gender		
Male	70	48.3
Female	75	51.7
Education levels		
No school	0	0
Elementary school	37	25.5
Junior high school	72	49.7
Senior high school	36	24.8
Occupation		
No working/ housewife	61	42.1
Private	4	2.7
Self-employed	18	12.4
Government employees	22	15.2
Farmer/ laborer	40	27.6
Economic status		
Low income (RMW <2,553,000 rupiahs)	34	23.4
Moderate income (RMW=2,553,000 rupiahs)	52	35.9
High income (RMW >2,553,000 rupiahs)	59	40.7

Table 1. Continued

Characteristics	f	%
Marital status		
No married	18	12.4
Married	127	87.6
Family type		
Nuclear family	75	51.7
Extended family	70	48.3
Health insurance		
No	23	15.9
Yes	122	84.1

Note. RMW: Regional minimum wage

3.2. Development of the holistic nursing model based on transcultural nursing

3.2.1. Results of convergent validity testing

The holistic nursing model based on transcultural nursing in this study was developed by modifying the holistic nursing model of Dossey and the transcultural nursing model of Leininger. The factors used to develop the model included respondent characteristics, technological factors, religious and life philosophical factors, social and kinship factors, cultural and lifestyle factors, biological factors, psychological factors, holistic nursing based on transcultural nursing, and quality of life.

As can be seen from Table 2, all indicators produced a loading factor value of more than 0.5. Similarly, all variables also produced an Average Variance Extracted (AVE) value of more than 0.5 (Ghozali & Latan, 2020; Wijaya, 2019). Therefore, all indicators were declared valid to measure the variables based on convergent validity.

Table 2. Results of convergent validity testing (n=145)

Variables	Indicators	Loading Factor	Average variance extracted (AVE)
Respondent characteristics	Gender	0.647	0.506
	Education level	0.722	
	Employment	0.593	
	Income	0.746	
	Marital status	0.703	
	Family type	0.773	
	Health insurance	0.776	
Technological factors	Utilization of telehealth	1.000	1.000
Religious and life philosophy factors	Religiosity	0.876	0.793
	Meaning of Life	0.905	
Social and kinship factors	Family Support	1.000	1.000
Cultural and lifestyle factors	The cultural-based lifestyle of DM patients	0.965	0.620
	Perception of DM based on culture	0.805	
	Perception of traditional-complementary therapy *(Usadha Bali)*	0.532	
Biological factors	Nutritional status	0.882	0.714
	Duration of type-2 DM	0.806	
Psychological factors	Diabetes distress	1.000	1.000
Holistic nursing based on transcultural nursing	Biological aspects	0.781	0.543
	Psychological aspects	0.594	
	Social-cultural aspects	0.757	
	Spiritual aspects	0.798	
Quality of life	Physical health	0.664	0.630
	Psychological well-being	0.866	
	Social relationships	0.846	
	Environment	0.783	

Note. Usadha Bali=Traditional therapy system in Bali

3.2.2. Results of construct reliability testing

Each variable produced a Cronbach's alpha value higher than 0.6 or a composite reliability value higher than 0.7, as shown in Table 3. All indicators were declared reliable in measuring the variables based on Cronbach's alpha value or composite reliability value (Ghozali & Latan, 2020).

Table 3. Results of construct reliability testing (n=145)

Variables	Cronbach's Alpha (α)	Composite Reliability
Respondent characteristics	0.841	0.877
Technological factors	1.000	1.000
Religious and life philosophy factors	0.741	0.885
Social and kinship factors	1.000	1.000
Cultural and lifestyle factors	0.774	0.823
Biological factors	0.604	0.833
Psychological factors	1.000	1.000
Holistic nursing based on transcultural nursing	0.716	0.824
Quality of life	0.799	0.871

3.2.3. Hypothesis testing

Table 4 illustrates the influence of some factors on holistic nursing based on transcultural nursing and the influence of holistic nursing on the quality of life. Hypothesis testing showed that technological factors had no significant effect on holistic nursing based on transcultural nursing with a *T*-statistic value of 0.802 (*p*=0.423). On the other hand, other variables, namely characteristics, religious and philosophical factors, social and kinship factors, cultural and lifestyle factors, biological factors, and psychological factors, collectively influenced holistic nursing based on transcultural nursing. Furthermore, there was a relationship between holistic nursing based on transcultural nursing and the quality of life.

Table 4. Hypothesis testing (n=145)

Influences	Path Coefficient	*T* Statistics (|O/STDEV|)	*p*	Interpretation
Respondent characteristics → Holistic nursing based on transcultural nursing	0.216	3.313	0.001	Significant
Technological factors → Holistic nursing based on transcultural nursing	0.045	0.802	0.423	insignificant
Religious and life philosophy factors → Holistic nursing based on transcultural nursing	0.218	2.836	0.005	Significant
Social and kinship factors → Holistic nursing based on transcultural nursing	0.195	2.579	0.010	Significant
Cultural and lifestyle factors → Holistic nursing based on transcultural nursing	0.211	2.833	0.005	Significant
Biological factors → Holistic nursing based on transcultural nursing	0.161	2.718	0.007	Significant
Psychological factors → Holistic nursing based on transcultural nursing	0.188	2.497	0.013	Significant
Holistic nursing based on transcultural nursing → quality of life	0.562	9.124	0.000	Significant

Note. O/STDEV=Original sample/ standard deviation

3.2.4. The final model of holistic nursing based on transcultural nursing on the quality of life in patients with T2DM

Figure 1 depicts the final model (fit) of holistic nursing based on transcultural nursing theory for the quality of life in patients with T2DM. As observed in Figure 1, holistic nursing based on transcultural nursing (X8) was directly influenced by respondent characteristics (X1), religious and life philosophy factors (X3), social and kinship factors (X4), cultural and lifestyle factors (X5), biological factors (X6), and psychological factors (X7). Quality of life (Y1) was directly influenced by holistic nursing based on transcultural nursing (X8).

Based on the hypothesis testing that eliminated relationships between variables with no significant effect, the model construct, as seen in Figure 1, was recommended. New findings from this research focus on the development of a holistic treatment model based on transcultural nursing concerning quality of life in T2DM patients, as revealed by the results of the structural model analysis depicted in Figure 2.

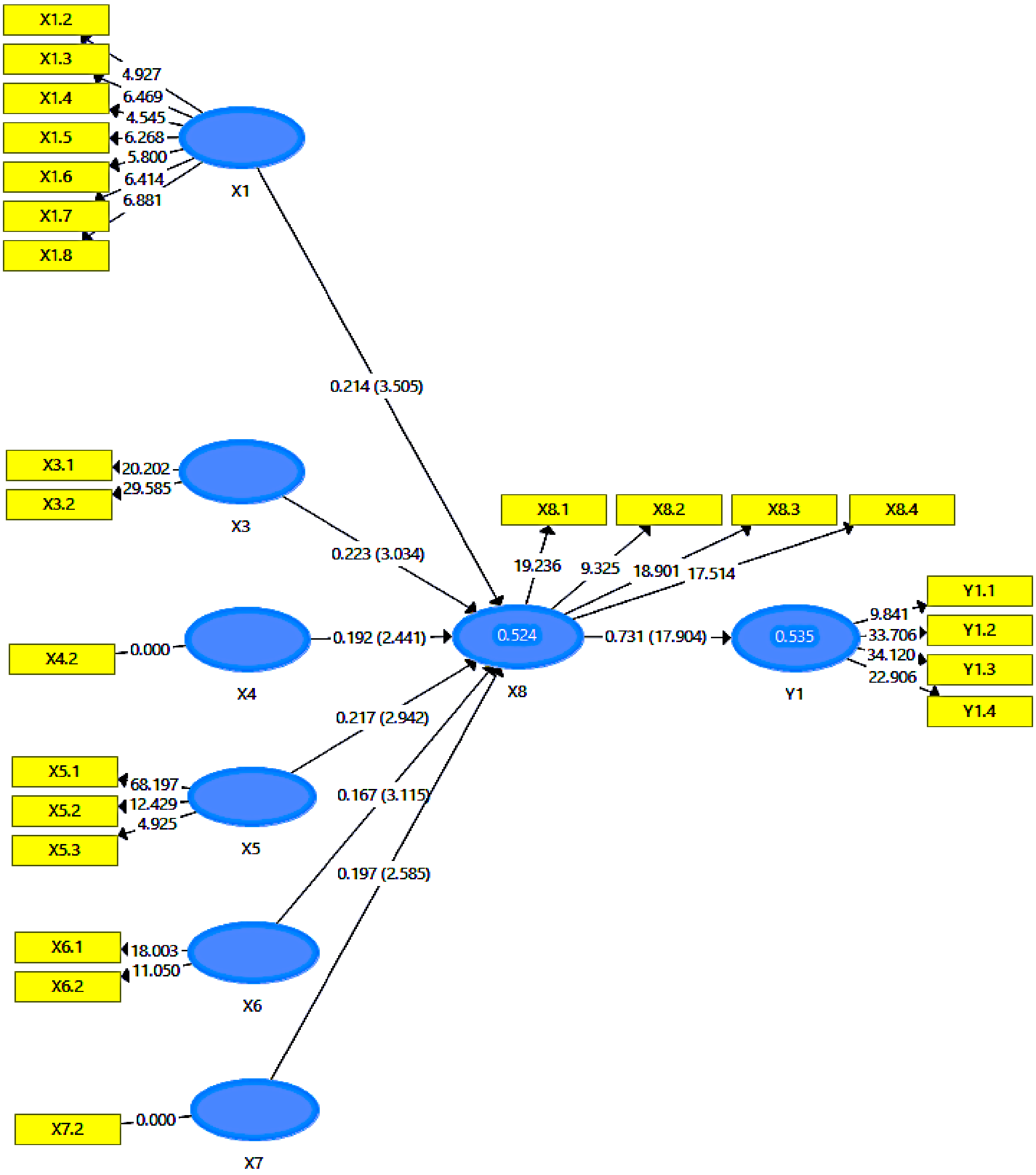

Figure 1. The final construct of the development of a holistic nursing model based on transcultural nursing for quality of life in T2DM people.

4. Discussion

This study aimed to develop a holistic nursing model based on transcultural nursing to enhance the quality of life of individuals with T2DM. The results showed that characteristic factors, religious and life philosophy factors, social and kinship factors, cultural and lifestyle factors, biological factors, and psychological factors directly influenced the holistic nursing based on transcultural nursing, while the quality of life was directly influenced by holistic nursing based on transcultural nursing. In addition, a final holistic nursing model based on transcultural nursing for the quality of life of T2DM people was developed. The following section will discuss each influence.

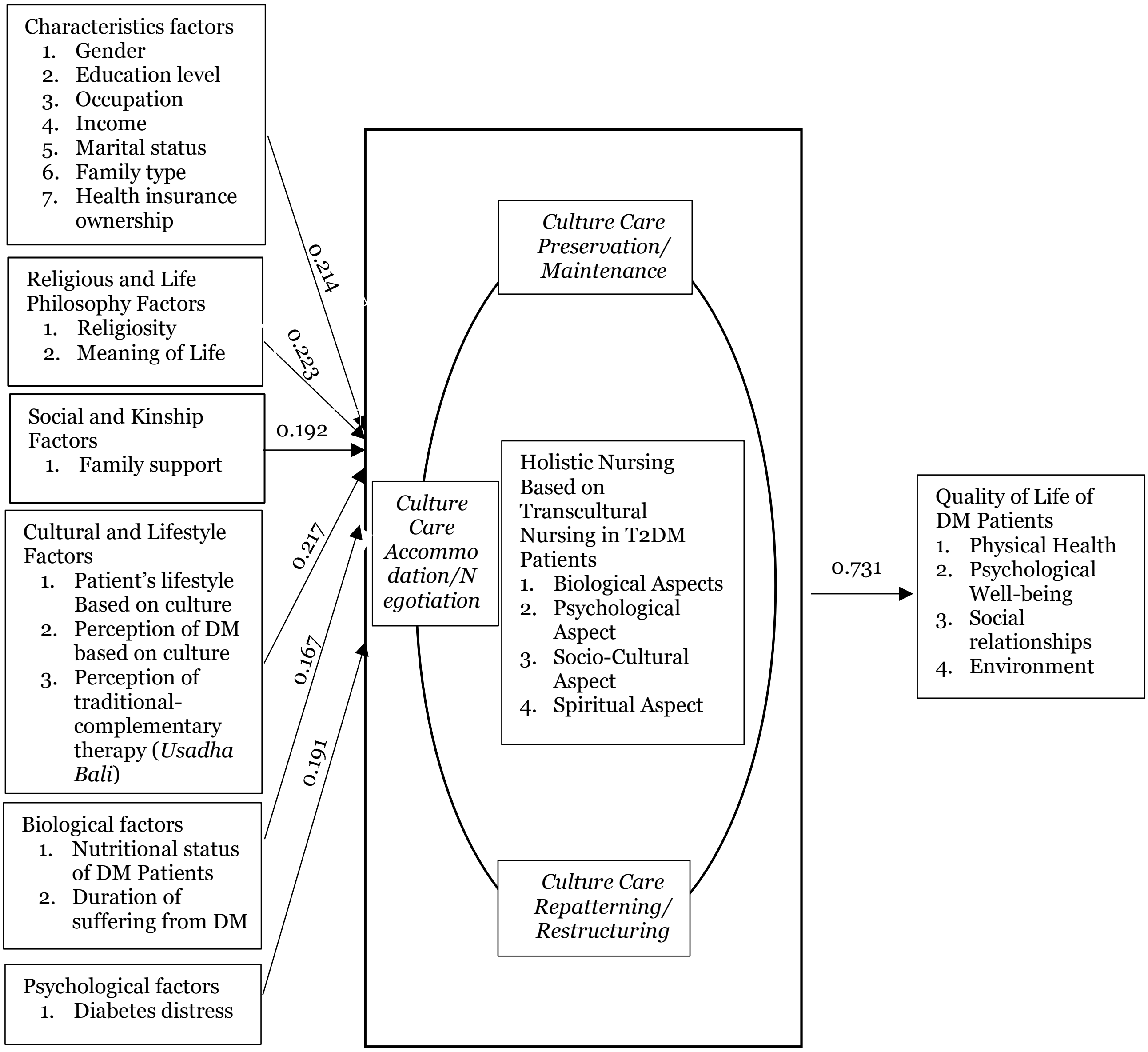

Figure 2. The final model on the development of a holistic nursing model based on transcultural nursing for quality of life in T2DM people

4.1. The influence of characteristic factors on holistic nursing based on transcultural nursing

This study showed that respondent characteristics significantly influenced the holistic nursing model based on transcultural nursing in DM patients. Female gender was associated with the holistic model based on transcultural nursing in T2DM patients. This finding aligns with a study on the determinants of adherence to holistic treatment in type 2 DM patients, which explains that gender is one of the determinants of adherence to treatment and care in T2DM (Reach et al., 2018). Women are at a higher risk of diabetes complications such as kidney diseases, blindness, and psychological disorders (CDC, 2022). A study reported that in diabetes self-care management practices, men were more dominant in reporting regular exercise and controlling their diet to manage blood glucose levels than women (Shahzad et al., 2018). Male DM patients exhibit more effective life management, lower levels of depression and anxiety, and also have more positive well-being than female patients. Another research also suggests that gender is associated with self-care practices, with men having a lower level of understanding and compliance compared to female respondents, requiring repeated education (Tran & Tran, 2022). Gender differences are crucial when individuals have to learn to live effectively with diabetes. Women with diabetes need to develop a more positive attitude toward the disease and its management. This is especially important for those who are responsible for tasks such as caring for the family and cooking, which may make it challenging for them to adhere to self-medication, exercise, foot care, blood sugar checks, and meal schedules. Patients should realize that they can manage DM with the support of doctors, spouses, friends, relatives, and family members (Siddiqui et al., 2013).

This study also revealed that the majority of respondents had secondary education. This is consistent with the research findings from Tran and Tran (2022), which report that the level of education is one of the determining factors in patient compliance with self-care abilities and adherence in T2DM individuals. T2DM individuals with higher education tend to exhibit better treatment adherence and compliance compared to patients with lower education levels. Patients with higher education possess better literacy and efficacy in implementing holistic care. Lack of education in caring for T2DM patients will impede the provision of holistic care management (Dobrowolska, 2022). The educational background is an influential factor in implementing holistic services, ultimately improving the quality of life (Zamanzadeh et al., 2015). Individuals with lower education levels are significantly more likely to have a high body mass index, affecting their work and physical activities. However, DM patients with higher education levels tend to consume a high-cholesterol diet and have higher alcohol intake due to frequent interactions with and consumption of more fast foods (Marcus et al., 2020; Steele et al., 2017). Patients with higher education possess better literacy and efficacy in implementing holistic care (Tran & Tran, 2022).

Another characteristic related to DM was employment. This study found that the majority of DM patients were housewives. Housework is considered a low level of activity. A previous study reported that individuals who do not work regularly have a higher risk of developing T2DM than those who work regularly (Koelmeyer et al., 2016). However, based on family income, this study showed that most respondents had high incomes. Research explains that high income is a risk factor for DM because it is related to diet and body mass index (CDC, 2022).

This study also revealed that marital status correlated with DM, with most respondents being married. Consistent with this finding, marital status is associated with reduced mortality and more effective protection for glycemic control (Jones, 2014). Marital status has the potential to influence the occurrence of DM, as many changes may occur from being single to being married. Changes in marital status have been observed in marriages over the last five years (de Oliveira., 2020). Age was also a factor that affected the ability to provide care in T2DM patients. Individuals of all age groups need to make decisions that may affect their health and physical and emotional well-being (Bloom et al., 2015; Hess et al., 2015). The majority of respondents in this study had health insurance. DM patients with health insurance utilized healthcare services more, achieve better diabetes control, and have lower morbidity. Additionally, adult DM patients aged under 65 who had health insurance reported visiting doctors more often in the past year than those who did not (Casagrande & Cowie, 2018).

4.2. The influence of religious and philosophical factors on holistic nursing based on transcultural nursing

This study also indicated that religious and philosophical factors, as assessed through religiosity and the meaning of life, influenced the holistic nursing model based on transcultural nursing. In the context of chronic diseases, the meaning of life is related to surrender, destiny, and family support (Bahtiar et al., 2020). Diabetes poses a threat to patients' overall well-being and quality of life. While diabetes management approaches have been implemented, physiological, physical, and mental health problems remain challenging. Research has reported that religiosity and religious coping strategies affect the management of diabetic patients (Onyishi et al., 2022). Another study has also identified the role of religiosity in DM treatment, affecting glycemic control and improving the psychological well-being of DM patients (Sukarno & Pamungkas, 2020). The participation of DM patients in religious practices and spiritual beliefs in the existence of God has the effect of decreasing stress levels and influencing the patient's glycemic control. The aspect of religiosity can be an important barrier for T2DM patients in facing emerging disease problems, making patient self-management more effective (Darvyri et al., 2018). In the future, diabetes management should integrate beliefs and incorporate them into patient behavior change interventions (Duke, 2021; Watkins et al., 2013). Religion understands the meanings of God, making it easier to interpret life based on religion, beliefs, and values as a guide to happiness.

4.3. The influence of social and kindship factors on holistic nursing based on transcultural nursing

Social and kinship factors significantly influenced holistic nursing based on transcultural nursing for T2DM patients. Family support in diet planning, treatment, and control can improve the QoL of diabetic patients (Mphasha et al., 2022). Social and kinship factors comprise family support indicators. DM patients need family support in carrying out treatment for their disease, especially at home (Wulandari et al., 2021). Since most DM patients are treated at home, family participation in diabetes intervention is crucial because it can increase patient self-efficacy and compliance with the supportive care provided in the form of informational, instrumental, emotional, and appreciation support (Baig et al., 2016). Families can provide support by facilitating treatment and serving healthy food. Male patients receive more support from their wives, whereas sick wives, on the other hand, do not receive as much support as they provide to their husbands. Diabetes interventions involving family support are essential in improving the health of diabetic patients (Baig et al., 2016).

Family support refers to the family's attitude, actions, and acceptance toward the sick person. This support typically comes from others, such as parents, children, spouses, or other family members. The support given can be in the form of informational, behavioral, or material support, making diabetic patients feel loved and cared for. Family support is essential as it affects compliance with holistic management (Amelia et al., 2018). The concept of social support in Balinese society is often referred to as the concept of *'Menyama braya'*. *Menyama braya* is a local wisdom concept that is part of the culture. They are aware that life will be interdependent on each other, so they maintain good relationships, feel equal, and do good to each other (Brata, 2019). Family support is closely related to compliance with routine control and more holistic management in diabetes patients. Family involvement in self-care will reduce the impact of complications and hospitalization rates for family members with diabetes (Onyango et al., 2022; Tondok et al., 2022). Families in Bali have a culture of living together with their extended family under one roof. In Bali, they know the cultural concept of *'menyama braya,'* which was passed down from their ancestors. *Menyama braya* is a form of social support between one family member and another family member (Brata, 2019).

4.4. The influence of cultural and lifestyle factors on holistic nursing based on transcultural nursing

This study demonstrated that cultural and lifestyle factors influenced holistic nursing based on transcultural nursing. A study in Bamar on DM patients who used traditional medicine stated that cultural beliefs and practices greatly influenced the patient's treatment choices and diet. Patients believe that diabetes is caused by cultural factors such as '*karma'* from previous or current lives and that diabetes can be cured (Shwe et al., 2020). Paying attention to understanding diabetes is crucial for a patient's health and well-being. Recognizing that diabetes is perceived to be caused by the influence of spirits requires health workers to possess sensitive knowledge and understanding of the patient's culture to enhance treatment efforts by considering the patient's beliefs while simultaneously encouraging them to adopt healthy behaviors (Ameyaw et al., 2022). Diabetes patients undergo physical, psychological, and emotional changes that affect their quality of life, highlighting the importance of understanding and respecting the values, beliefs, health practices, and feelings of the patient (Álvarez-Najar, 2020). An ethnonursing study in East Sumba, Indonesia, regarding cultural factors, beliefs, and way of life of diabetes patients found that cultural factors such as traditional ceremonies, happa (betel chewing), and the use of traditional medicine are closely linked to Sumba society and the daily lives of diabetes patients, including their eating and drinking patterns, spiritual values, and sleeping habits (Elizabeth et al., 2022). The results of this study have important implications for the care of diabetes patients

Nurses, as care providers, are expected to deliver holistic and culturally-based care. They should possess cultural competency to assess and plan interventions that are culturally appropriate and do not conflict with the prescribed treatment process. Value systems, beliefs, customs, and family patterns can serve as a guide for planning culturally appropriate care for treating diabetes (Sachdeva et al., 2015). Nursing practice is expected to understand culture-based nursing theory, namely transcultural nursing, by preserving, negotiating, and/or restructuring culture (Elizabeth et al., 2022). Cultural practices and emotional functioning are diabetes risks that need to be considered when adapting culturally specific diabetes prevention programs (Tang et al.,2020).

Providing diabetes care should involve an understanding of patients' perspectives, values, cultures, social factors, and language limitations, which can facilitate optimal care and enable patients and health service providers to achieve treatment goals (Rebolledo & Arellano, 2016).

This study argues that culture is an inherent part of everyday life for the Balinese people. The culture and lifestyle of diabetes patients in Bali may serve as a reference for nurses in developing holistic, culturally sensitive nursing care plans for diabetes patients. It is important to assess diabetes patients' cultural beliefs and practices because they influence how patients manage their own disease. It is assumed by Balinese people that illness occurs due to '*karmaphala'* or the result of actions during a previous or current life that must be atoned for. They also believe that the use of *Loloh*, namely herbal concoctions prepared using Balinese procedures, is one of the choices in *Usadha Bali* (Balinese Traditional Medicine System) that can treat diseases, one of which is diabetes.

4.5. The influence of biological factors on holistic nursing based on transcultural nursing

Biological factors had a significant influence on holistic nursing based on transcultural nursing for T2DM individuals. These factors consist of indicators of nutritional status and the duration of T2DM. The focus of intervention for diagnosed T2DM patients is nutritional therapy aimed at achieving ideal body weight and maintaining glycemic, lipid, and blood pressure control. Health workers, patients, and families must collaborate in making decisions regarding the role of weight management interventions in diabetes care (Franz, 2017). Weight reduction in obese patients with diabetes can reduce the risk of cardiovascular disorders, improve quality of life, and enhance mobility, physical function, and sexual function by considering the appropriate use of hyperglycemic therapy (Wilding, 2014). Nutritional status and requirements in most communities are influenced by local cultural habits and customs. The existence of cultural differences results in various cultural practices, including the cultural diet of patients (Mora & Golden, 2017). The IDF recommends that nutritionists should pay attention to individual diets according to food preferences and the culture individuals adhere to (IDF, 2018).

Holistic and culturally sensitive management in addressing nutritional status in diabetes patients is essential and considered effective in reducing the incidence of complications and controlling glycemia in diabetes (Mora & Golden, 2017). A counter to cultural norms will complicate patient dietary compliance and decrease adherence. Therefore, understanding cultural and personal barriers to diet management is crucial (Deng et al., 2013). In Bali, many people still consume fatty meats such as pork, especially during traditional activities. People tend to view consuming processed pork as part of their culture that cannot be omitted during ceremonies. This poses a challenge for health workers in implementing holistic management based on transcultural nursing to optimize nutritional status and maintain good levels of dietary compliance in DM patients.

4.6. The influence of psychological factors on holistic nursing based on transcultural nursing

This study also found that diabetes distress is an indicator of psychological factors that contribute to the development of the holistic nursing model based on transcultural nursing. Research has shown that diabetes distress can exert pressure on diabetes management, necessitating the strengthening of self-care skills and optimization of coping mechanisms while minimizing discomfort associated with changes and using external support (Kalra et al., 2017). It is important to note that diabetes distress is distinct from depression. Diabetes distress occurs when individuals with diabetes feel frustrated, overwhelmed, or defeated by their condition, and these feelings may come and go. Prolonged experiences of these feelings without resolution can escalate into depression, adversely affecting diabetes management. Individuals experiencing diabetes distress may neglect their self-care routines, such as missing insulin doses or failing to take prescribed medications, which can lead to prolonged fatigue over time (Diabetes UK, 2023).

Holistic management of individuals with diabetes encompasses psychosocial factors, psychological support, lifestyle modifications, health education, herbal remedies, cultural practices, yoga, and technology. Efforts to enhance the effectiveness of diabetes treatment programs must integrate cultural considerations, health practices, and technological advances. While culture may pose challenges to treatment programs, it can also serve as a supportive element in diabetes management (Juanamasta et al., 2021). The increased prevalence of psychological issues and other facets of diabetes underscores the necessity of a holistic approach to its treatment.

This holistic nursing intervention entails supporting patients in managing medication intake, adopting healthier dietary habits, coordinating exercise routines, and achieving weight loss goals. It should also include cognitive-behavioral therapy to enhance patients' psychological well-being and to empower them in managing their diabetes. Cultural and spiritual aspects are equally important, as patients may seek to fulfill their religious needs during the intervention, which can positively impact self-care outcomes. Social and cultural backgrounds are considered crucial sources of support in coping with the disease (Roohafza et al., 2014). Adopting a holistic care approach results in an improved quality of life for diabetic patients (Laochai et al., 2021).

Psychological distress experienced by diabetes patients can significantly influence diabetes care management. Psychological disorders in diabetes patients require attention and appropriate management, even though lifestyle and behavior changes are the main aspects of diabetes care (Kalra et al., 2018). Given that diabetes is a chronic condition that cannot be cured, it requires a more holistic approach that takes cultural factors into account. Culture must be considered because most diabetes patients receive treatment at home and are influenced by the various cultural practices prevalent in their communities. Psychological disorders tend to be more common among patients in urban areas, such as Denpasar City. The demands of urban living often lead to increased stress levels among patients, which may go unnoticed.

4.7. The effect of implementing a holistic nursing module based on transcultural nursing on the quality of life of T2DM patients

This study demonstrated that holistic nursing based on transcultural nursing significantly affected the quality of life with a positive correlation. These findings indicate that optimum holistic nursing based on transcultural nursing leads to an improvement in patient's quality of life. The variables of holistic nursing based on transcultural nursing consist of four indicators: biological, psychological, socio-cultural, and spiritual aspects, all with high factor loadings. Similarly, the quality of life significantly comprises four indicators: physical health, psychological well-being, social relationships, and the environment. According to research by Ofori and Unachukwu (2014), DM is a complex disease that requires attention to all aspects to overcome acute complications while preventing long-term complications. Holistic services based on transcultural nursing view patients from physical, psychological, socio-cultural, and spiritual aspects, considering cultural differences in their lives regarding meanings, patterns, values, and other characteristics. The culture of care provided can be a general culture or tailored to individuals/groups to enhance the patient's quality of life (Betancourt, 2016; Dossey et al., 2005). Diabetes care requires cultural factors and interventions appropriate to the patient's culture to achieve better results, such as addressing the patient's local food habits (Sachdeva et al., 2015). A holistic lifestyle approach in DM patients can lower blood glucose levels and significantly improve the patient's quality of life (Kumari et al., 2021).

One of the developments in holistic interventions in the health system is yoga. Yoga is an intervention with a spiritual approach regardless of religion, ethnicity, beliefs, gender, or health conditions. Yoga can effectively calm the body, mind, and soul (Thulasi et al., 2019; Tiwari & Negi, 2019). In addition to yoga, approaches with complementary traditional therapies are closely associated with holistic care. Each region has its own characteristics in the form of complementary traditional therapies that have been passed down through generations based on culture (Ismail et al., 2019). The use of complementary traditional therapies is also significantly related to glycemic control, quality of life, and overall health improvement (Rhee et al., 2018). Patients accept responsibility for their own quality of life and well-being, which are uniquely determined by the implementation of holistic health (Ventegodt et al., 2016).

Holistic nursing based on transcultural nursing is a new intervention developed to improve the quality of life of T2DM patients. Holistic nursing based on transcultural nursing includes the development of biological, psychological, socio-cultural, and spiritual care. Apart from medication, people believe that there are many other aspects that can maintain health. Currently, in Bali, many treatments have been developed that use medical therapies in collaboration with traditional therapies. Since time immemorial, people in Bali have developed various beliefs in society to improve their health. Beliefs in the health sector include the use of *loloh, boreh*, massage, yoga, or meditation therapy and belief in the power of prayer. Patients tend to do various things to achieve a good quality of life.

5. Implications and limitations

Transcultural-based holistic nursing modules and models can serve as the foundation for policymaking and implementation in delivering comprehensive services to enhance the quality of life and glycemic control in T2DM patients. However, while research has been conducted on model development, its effectiveness in T2DM patients has not been fully tested, nor has it been implemented in larger settings and samples.

6. Conclusion

The holistic nursing model based on transcultural nursing was directly influenced by the respondent characteristics, religious and life philosophy factors, social and kinship factors, cultural and lifestyle factors, biological factors, and psychological factors. Additionally, the holistic nursing model based on transcultural nursing directly influenced the quality of life of patients with T2DM. A final holistic nursing model based on transcultural nursing for the quality of life of T2DM people was also developed from the results. The holistic nursing model based on transcultural nursing can be used as a guide for nursing care and standard operating procedures (SOP) in healthcare services to improve the quality of life for patients with T2DM.

Acknowledgment

The authors would like to extend their gratitude to the Faculty of Nursing, Airlangga University, and STIKes Wira Medika Bali for financial support.

Author contribution

NWS, YSA: Study design
NWS, DAR, NTD, IS: Data collection
NWS, YSA, NDK: Data analysis
NWS, YSA, NDK, DAR, NTD, IS: Manuscript preparation and revision

Conflict of interest

There is no potential conflicts of interest.

References

Ade, M. S., Kulkarni, J., & Ade, S. S. (2011). *Healthcare technologies and telehealth emergency (THE) system telehealth* [paper presentation]. The 2nd International Conference on Wireless Communication, Vehicular Technology, Information Theory and Aerospace & Electronic Systems Technology (Wireless VITAE), Chennai, India, 1–4. https://doi.org/10.1109/WIRELESSVITAE.2011.5940870

Albougami, A. S., Pounds, K. G., & Alotaibi, J. S. (2016). Nursing and health care comparison of four cultural competence models in transcultural nursing : A discussion paper. *International Archives of Nursing and Health Care*, *2*(4), 1–5. https://doi.org/10.23937/2469-5823/1510053

Álvarez-Najar, J., Sanabria, R., & Pena-Pita, A. (2020). Beliefs and practices in diabetes care. *Duazary*, *17*(1), 74–86. https://doi.org/10.21676/2389783X.3218

Amelia, R., Lelo, A., Lindarto, D., Mutiara, E. (2018). Quality of life and glycemic profile of type 2 diabetes mellitus patients of Indonesian: A descriptive study. *IOP Conference Series: Earth and Environmental Science, 125*(1), 012171. https://doi.org/10.1088/1755-1315/125/1/012171

American Diabetes Association. (2019). 5. Lifestyle management: Standards of medical care in diabetes-2019. *Diabetes Care*, *42*(Suppl1), S46–S60. https://doi.org/10.2337/dc19-S005

Ameyaw, K., Dyson, S., & Anthony, D. (2022). Experiences and cultural beliefs of patients with diabetes: Lessons for nursing practice, education, and policy. *International Journal of Africa Nursing Sciences*, *16*(10), 100392. https://doi.org/10.1016/j.ijans.2021.100392

Bahtiar, B., Sahar, J., & Wiarsih, W. (2020). Meaning of life among elderly individuals with chronic diseases living with family: A qualitative study. *Makara Journal of Health Research*, *24*(1), 35–40. https://doi.org/10.7454/msk.v24i1.1161

Baig, A. A., Benitez, A., Quinn, M. T., & Burnet, D. L. (2016). Family interventions to improve diabetes outcomes for adults. *HHS Public Access*, *1353*(1), 89–112.

https://doi.org/10.1111/nyas.12844.Family

Bali Provincial Health Office [Dinas Kesehatan Provinsi Bali]. (2017). *Profil kesehatan provinsi Bali 2017 [Health profile of Bali province].* https://www.diskes.baliprov.go.id/download/profil-kesehatan-provinsi-bali-tahun-2017/

Betancourt, D. A. B. (2016). Madeleine Leininger and the transcultural theory of nursing. *The Downtown Review*, *2*(1), 1-7.

Bloom, D. E., Chatterji, S., Kowal, P., Lloyd-Sherlock, P., McKee, M., Rechel, B., Rosenberg, L., & Smith, J. P. (2015). Macroeconomic implications of population ageing and selected policy responses. *The Lancet, 385*(9968), 649–657. https://doi.org/10.1016/S0140-6736(14)61464-1

Brata, I. (2019). Menyama braya: Refleksi multikulturalisme memperkuat identitas nasional [Menyama braya: Reflection of multiculturalism to strengthen national identity]. *Media Bina Ilmiah*, *13*(1978), 1493–1500. https://doi.org/10.33758/mbi.v13i8.227

Casagrande, S. S., & Cowie, C. C. (2018). Health insurance and diabetes. In C. C. Cowie et al. (Eds.), *Diabetes in America* (3rd ed.). National Institute of Diabetes and Digestive and Kidney Diseases (US).

CDC. (2022). *Diabetes and women.* https://www.cdc.gov/diabetes/library/features/diabetes-and-women.html

Cholil, A. R., Lindarto, D., Pemayun, T. G. D., Wisnu, W., Kumala, P., & Puteri, H. H. S. (2019). DiabCare Asia 2012: Diabetes management, control, and complications in patients with type 2 diabetes in Indonesia. *Medical Journal of Indonesia, 28*(1), 47-56. https://doi.org/10.13181/mji.v28i1.2931

Darvyri, P., Christodoulakis, S., Galanakis, M., Avgoustidis, A. G., Thanopoulou, A., & Chrousos, G. P. (2018). On the role of spirituality and religiosity in type 2 diabetes mellitus management-A systematic review. *Psychology*, *9*, 728–744. https://doi.org/10.4236/psych.2018.94046

Deng, F., Zhang, A., & Chan, C. B. (2013). Acculturation, dietary acceptability, and diabetes management among Chinese in North America. *Frontier in Endocrinology*, *4*, 108. https://doi.org/10.3389/fendo.2013.00108

de Oliveira, C. M., Viater Tureck, L., Alvares, D., Liu, C., Horimoto, A. R. V. R., Balcells, M., de Oliveira Alvim, R., Krieger, J. E., & Pereira, A. C. (2020). Relationship between marital status and incidence of type 2 diabetes mellitus in a Brazilian rural population: The Baependi Heart Study. *PloS one, 15*(8), e0236869. https://doi.org/10.1371/journal.pone.0236869

Diabetes UK. (2023). *What is diabetes distress and burnout?.* https://www.diabetes.org.uk/guide-to-diabetes/emotions/diabetes-burnout

Dobrowolska, B., Whelan, J., & Timmins, F. (2022). Managing holistic nursing practice: The need for spiritual care competence in health care practice. *Journal of Nursing Management, 30*(5), 1083–1086. https://doi.org/10.1111/jonm.13538

Dossey, B. M., Keegan, L., & Guzetta. (2005). *Holistic nursing: A handbook for practice* (4th ed.). Jones and Bartlett.

Duke, N. (2021). Type 2 diabetes self-management: Spirituality, coping and responsibility. *Journal of Research in Nursing, 26*(8), 743–760. https://doi.org/10.1177/17449871211026958

Elizabeth, Y., Gunawan, S., Christina, M., Sukartiningsih, E., & Namuwali, D. (2022). Cultural, belief, and lifeway factors in diabetes patients: An ethnonursing study. *Malaysian Journal of Medicine and Health Sciences*, *18*(8), 148–157. https://doi.org/10.47836/mjmhs18.6.21

Fisher, L., Glasgow, R. E., Mullan, J. T., Skaff, M. M., & Polonsky, W. H. (2008). Development of a brief diabetes distress screening instrument. *Annals of Family Medicine, 6*(3), 246–252. https://doi.org/10.1370/afm.842

Franz M. J. (2017). Weight management: Obesity to diabetes. *Diabetes Spectrum, 30*(3), 149–153. https://doi.org/10.2337/ds17-0011

Ghozali, I., & Latan, H. (2020). P*artial least squares: Concepts, techniques, and applications to use 3.0 SmartPLS program [Partial least squares: Konsep, teknik, dan aplikasi menggunakan program smartPLS 3.0]* (2nd ed.). Undip Press.

Hair, J. F., Ringle, C. M., Gudergan, S. P., Fischer, A., Nitzl, C., & Menictas, C. (2019). Partial least squares structural equation modeling-based discrete choice modeling: An illustration in modeling retailer choice. *Business Research, 12*, 115–142. https://doi.org/10.1007/s40685-018-0072-4

Hess, T. M., Strough, J., & Löckenhoff, C. (2015). *Aging and decision making: Empirical and applied perspectives*. Elsevier Academic Press.

IDF. (2018). IDF diabetes atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045. *Diabetes Research and Clinical Practice*, *138*, 271–281. https://doi.org/10.1016/j.diabres.2018.02.023

International Diabetes Federation. (2019). *IDF diabetes atlas* (9th ed.). International Diabetes Federation. https://www.diabetesatlas.org/en/resources/

Ismail, S., Dwidiyanti, M., Wiguna, R. I., Yusuf, N. A. R., Riani, S., Adisty, P., Sari, I. W., Dewi, T., Kurniawati, E., & Lisnawati, L (2019). *Keperawatan holistik dan aplikasi intervensi komplementer [Holistic care and the applications of complementary interventions]*. S. Ismail (Ed.). LPPM STikes Kendal.

Juanamasta, I. G., Aungsuroch, Y., Gunawan, J., Suniyadewi, N. W., & Nopita Wati, N. M. (2021). Holistic care management of diabetes mellitus: An integrative review. *International Journal of Preventive Medicine, 12,* 69. https://doi.org/10.4103/ijpvm.IJPVM_402_20

Jones, J. E. D. (2014). *Is marital status a determinant of self-monitoring of blood glucose ?* [Theses, University of Mississippi). Electronic Theses and Dissertations. https://egrove.olemiss.edu/etd/593/

Kalra, S., Jena, B. N., & Yeravdekar, R. (2018). Emotional and psychological needs of people with diabetes. *Indian Journal of Endocrinology and Metabolism, 22*(5), 696–704. https://doi.org/10.4103/ijem.IJEM_579_17

Kalra, S., Verma, K., & Singh Balhara, Y. P. (2017). Management of diabetes distress. *The Journal of the Pakistan Medical Association, 67*(10), 1625–1627.

Koelmeyer, R. L., Dharmage, S. C., & English, D. R. (2016). Diabetes in young adult men: Social and health-related correlates. *BMC Public Health*, *16,* 1061. https://doi.org/10.1186/s12889-016-3704-7

Kumari, G., Singh, V., Chhajer, B., & Jhingan, A. K. (2021). Effect of lifestyle intervention holistic approach on blood glucose levels, health-related quality of life and medical treatment cost in type 2 diabetes mellitus patients. *Acta Scientiarum. Health Sciences*, (2017), 1–19. https://doi.org/10.4025/actascihealthsci.v43i1.53729

Lagisetty, P. A., Priyadarshini, S., Terrell, S., Hamati, M., Landgraf, J., Chopra, V., & Heisler, M. (2017). Culturally targeted strategies for diabetes prevention in minority population. *The Diabetes Educator, 43*(1), 54–77. https://doi.org/10.1177/0145721716683811

Laochai, W., Salab, R., Pipatsombat, P., Tejangkura, L., Chinpinkleaw, P., & Kearmalai, N. (2021). Holistic nursing for diabetics with complications: A case study. *Vajira Nursing Journal*, *23*(1), 84–97.

Leininger, M. (2002). Culture care theory: A major contribution to advance transcultural nursing knowledge and practices. *Journal of Transcultural Nursing*, *13*(3), 189–192. https://doi.org/10.1177/10459602013003005

Mamo, Y., Bekele, F., Nigussie, T., & Zewudie, A. (2019). Determinants of poor glycemic control among adult patients with type 2 diabetes mellitus in Jimma University Medical Center, Jimma zone, South West Ethiopia: A case-control study. *BMC Endocrine Disorders, 19*(1), 91. https://doi.org/10.1186/s12902-019-0421-0

Ministry of Health Republic of Indonesia. (2023). *Terapi nutrisi medis pada diabetes melitus tipe 2 [Medical nutrition therapy in type 2 diabetes mellitus].* https://yankes.kemkes.go.id/view_artikel/2112/terapi-nutrisi-medis-pada-diabetes melitus-tipe-2-series-3

Mora, N., & Golden, S. H. (2017). Understanding cultural influences on dietary habits in Asian, Middle Eastern, and Latino patients with type 2 diabetes: A review of current literature and future directions. *Current Diabetes Reports, 17*(12), 126. https://doi.org/10.1007/s11892-017-0952-6

Mphasha, M. H., Mothiba, T. M., & Skaal, L. (2022). Family support in the management of diabetes patients ' perspectives from Limpopo province in South Africa. *BMC Public Health*, *22*, 2421. https://doi.org/10.1186/s12889-022-14903-1

Ofori, S. N., & Unachukwu, C. N. (2014). Holistic approach to prevention and management of type 2 diabetes mellitus in a family setting. *Diabetes, Metabolic Syndrome and Obesity, 7,* 159–168. https://doi.org/10.2147/DMSO.S62320

Ofori, S. N., & Unachukwu, C. N. (2022). Holistic approach to prevention and management of type 2 diabetes mellitus in a family setting Holistic approach to prevention and management of type 2 diabetes mellitus in a family setting. *Diabetes, Metabolic Syndrome and Obesity, 2014*(7), 159–168. https://doi.org/10.2147/DMSO.S62320

Onyango, J. T., Namatovu, J. F., Besigye, I. K., & Kaddumukasa, M. (2022). The relationship between perceived social support from family and diabetes self-management among patients in Uganda. *PanAfrican Medical Journal, 41,* 279. https://doi.org/10.11604/pamj.2022.41.279.33723

Onyishi, C. N., Eseadi, C., Ilechukwu, L. C., Okoro, K. N., Okolie, C. N., Egbule, E., & Asogwa, E. (2022). Potential influences of religiosity and religious coping strategies on people with diabetes. *World Journal of Clinical Cases, 10*(25), 8816–8826. https://doi.org/10.12998/wjcc.v10.i25.8816

Reach, G., Pellan, M., Crine, A., Touboul, C., Ciocca, A., & Djoudi, Y. (2018). Holistic psychosocial determinants of adherence to medication in people with type 2 diabetes. *Diabetes and Metabolism*, *44*(6), 500–507. https://doi.org/10.1016/j.diabet.2018.06.001

Rebolledo, J. A., & Arellano, R. (2016). Cultural differences and considerations when initiating insulin. *Diabetes Spectrum*, *29*(3), 185–190. https://doi.org/10.2337/diaspect.29.3.185

Rhee, T. G., Westberg, S. M., & Harris, I. M. (2018). Complementary and alternative medicine in US adults with diabetes: Reasons for use and perceived benefits. *Journal of Diabetes, 10*(4), 310-319. https://doi.org/10.1111/1753-0407.12607

Roglic, G. (2016). WHO Global report on diabetes: A summary. *International Journal of Noncommunicable Diseases, 1*(1), 3-8. https://doi.org/10.4103/2468-8827.184853

Roohafza, H. R., Afshar, H., Keshteli, A. H., Mohammadi, N., Feizi, A., Taslimi, M., & Adibi, P. (2014). What's the role of perceived social support and coping styles in depression and anxiety? *Journal of Research in Medical Sciences, 19*(10), 944–949.

Sachdeva, S., Khalique, N., Ansari, M. A., Khan, Z., Mishra, S.K., & Sharma, G. (2015). Cultural determinants: Addressing barriers to holistic diabetes care. *Journal of Social Health and Diabetes*, *03*(01), 033–038. https://doi.org/10.4103/2321-0656.140885

Seiglie, J. A., Marcus, M. E., Ebert, C., Prodromidis, N., Geldsetzer, P., Theilmann, M., Agoudavi, K., Andall-Brereton, G., Aryal, K. K., Bicaba, B. W., Bovet, P., Brian, G., Dorobantu, M., Gathecha, G., Gurung, M. S., Guwatudde, D., Msaidié, M., Houehanou, C., Houinato, D., ... Manne-Goehler, J. (2020). Diabetes prevalence and its relationship with education, wealth, and BMI in 29 low- and middle-income countries. *Diabetes Care, 43*(4), 767–775. https://doi.org/10.2337/dc19-1782

Shahzad, A., Ahmad, M. M., Anwer, I., Ijaz, N., Shahzad, M., Usman, M. (2018). Gender-specific knowledge of diabetes and its management among patients visiting outpatient clinics in Faisalabad, Pakistan. *Cureus*, *10*(8), e3119. https://doi.org/10.7759/cureus.3119

Shwe, H., Oo, W., Nau, K., & Mar, K. (2020). The cultural practices of Bamar diabetic patients: An ethnographic study. *Heliyon, 6*(2), e03267. https://doi.org/10.1016/j.heliyon.2020.e03267

Siddiqui, M. A., Khan, M. F., & Carline, T. E. (2013). Gender differences in living with diabetes mellitus. *Materia Socio Medica 25*(2), 140–142. https://doi.org/10.5455/msm.2013.25.140-142

Sitawa, M. & Muhati, C. (2016). Socio-cultural dynamics influencing diabetes control: A case study of Vihiga district hospital, Kenya. *International Journal of Scientific Research and Innovative Technology, 3*(2), 140–158.

Soelistijo, S. A., Lindarto, D., Decroli, E., Permana, H., Sucipto, K. W., Kusnadi, Y., Budiman, B., Ikhsan, R., Sasiarini, L., & Sanusi H. (2019). *Pedoman pengelolaan dan pencegahan diabetes melitus tipe 2 dewasa di Indonesia 2019 [The guideline of adult type 2 diabetes mellitus management and prevention in Indonesia 2019].* Perkumpulan Endokrinologi Indonesia. https://pbperkeni.or.id/wp-content/uploads/2020/07/Pedoman-Pengelolaan-DM-Tipe-2-Dewasa-di-Indonesia-eBook-PDF-1.pdf

Steele, C. J., Schöttker, B., Marshall, A. H., Kouvonen, A., O'Doherty, M. G., Mons, U., Saum, K. U., Boffetta, P., Trichopoulou, A., Brenner, H., & Kee, F. (2017). Education achievement and type 2 diabetes-what mediates the relationship in older adults? Data from the ESTHER study: A population-based cohort study. *BMJ Open, 7*(4), e013569. https://doi.org/10.1136/bmjopen-2016-013569

Sukarno, A., & Pamungkas, R. A. (2020). Religiousness associated with type 2 diabetes care management: A concept analysis. *International Journal of Nursing and Health Services (IJNHS), 3*(3), 462–470. https://doi.org/10.35654/ijnhs.v3i3.324

Tang, T. S., Halani, K., Sohal, P., Bains, P., & Khan, N. (2020). Do cultural and psychosocial factors contribute to type 2 diabetes risk ? A look into Vancouver's South Asian community. *Canadian Journal of Diabetes*, *44*(1), 14–21. https://doi.org/10.1016/j.jcjd.2019.04.015

Thulasi, A., Kumar, V., Jagannathan, A., Angadi, P., Umamaheswar, K., & Raghuram, N. (2019). Development and validation of yoga program for patients with type 2 diabetes mellitus (T2DM). *Journal of Religion and Health, 61*(4), 1-17. https://doi.org/10.1007/s10943-019-00859-x

Tiwari , I., & Negi , C. S. . (2019). The relevance of yoga in developing holistic health and holistic community. *Environment Conservation Journal, 20*(SE), 83–88. https://doi.org/10.36953/ECJSE.2019.02016

Tolossa, T., Mengist, B., Mulisa, D., Fetensa, G., Turi, E., & Abajobir, A. (2020). Prevalence and associated factors of foot ulcer among diabetic patients in Ethiopia: A systematic review and meta-analysis. *BMC Public Health*, *20*(1), 41. https://doi.org/10.1186/s12889-019-8133-y

Tondok, S. B., Rachman, N., Hanafi, W., & Susanto, A. (2022). Correlation between family support and adherence to routine controlling treatment in patients with type 1 diabetes mellitus in Merauke. *International Journal of Nursing and Midwifery Science (IJNMS)*, *6*(3), 235-242. https://doi.org/10.29082/IJNMS/2022/Vol6/Iss3/414

Tran, A. H. T., & Tran, N. N. (2022). Holistic self-management behavior among urban patients with type 2 diabetes. *International Journal of Public Health Science, 11*(3), 846–851. https://doi.org/10.11591/ijphs.v11i3.21707

Ventegodt, S., Kandel, I., Ervin, D. A., & Merrick, J. (2016). Concepts of holistic care. In I.L Rubin et al. (eds.), *Health care for people with intellectual and developmental disabilities across the lifespan* (pp. 1935-1941). Springer International Publishing. https://doi.org/10.1007/978-3-319-18096-0_148

Watkins, Y.J., Quinn, L.T., Ruggiero, L., Quinn, M.T. and Choi, Y.K. (2013) Spiritual and religious beliefs and practices and social support's relationship to diabetes self-care activities in African Americans. *Diabetes Education, 39*(2), 231-239. http://doi.org/10.1177/0145721713475843

Wibisono et al. (2021). *Petunjuk Praktis Terapi Insulin pada Pasien Diabetes Mellitus 2021 [Practical guideline for insulin therapy on diabetes mellitus patients 2021].* Perkeni. https://pbperkeni.or.id/wp-content/uploads/2021/11/22-10-21-_-Website-Pedoman-Petunjuk-Praktis-Terapi-Insulin-Pada-Pasien-Diabetes-Melitus-Ebook.pdf

Wijaya, A. (2019). *Metode penelitian menggunakan smart PLS 03 [Research methods using 3.0 smartPLS].* Innosain.

Wilding, J. P. H. (2014). The importance of weight management in type 2 diabetes mellitus. *The International Journal of Clinical Practice*, *68*(6), 682–691. https://doi.org/10.1111/ijcp.12384

Wulandari, I., Kusnanto, K., Wibisono, S., & Haryani, A. (2021). Family support in caring for diabetes mellitus patient: Patient's perspective. *Macedonian Journal of Medical Sciences*, *9*, 199–205. https://doi.org/10.3889/oamjms.2021.5778

Zamanzadeh, V., Jasemi, M., Valizadeh, L., & Keogh, B. (2015). Effective factors in providing holistic care: A qualitative study. *Indian Journal of Palliative Care, 21*(2), 214–224. https://doi.org/10.4103/0973-1075.156506

Zhou, J., Wang, Q., Xiang, Z., Tong, Q., Pan, J., Wan, L., & Chen, J. (2019). Network pharmacology analysis of traditional Chinese medicine formula xiao ke yin shui treating type 2 diabetes mellitus. *Evidence-based Complementary and Alternative medicine: eCAM*, 2019, 4202563. https://doi.org/10.1155/2019/4202563

EDITORIAL TEAM

1. **Editor-in-chief**
   Meira Erawati
   Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia

2. **Editorial board**
   - Andrew Cashin
     Southern Cross University, Australia
   - Rozzano C. Locsin
     Department of Nursing, Tokushima University, Japan
   - Yati Afiyanti
     Faculty of Nursing, Universitas Indonesia, Indonesia
   - Sri Warsini
     School of Nursing, Universitas Gadjah Mada, Indonesia
   - Jennieffer A Barr
     School of Nursing and Midwifery, Central Queensland University, Australia
   - Maarten M Kaaijk
     School of Nursing, Hanze University of Applied Sciences, Netherlands
   - Ferry Efendi
     Faculty of Nursing, Universitas Airlangga, Indonesia
   - Mardiyono Mardiyono
     Department of Nursing, Poltekkes Kemenkes Semarang, Indonesia
   - Faustino Jerome Gulle Babate
     Beta Nu Delta Nursing Society, Philippines
   - Tantut Susanto
     School of Nursing, Universitas Jember, Indonesia
   - Cyruz P. Tuppal
     St. Paul University Philippines System, Philippines
   - Suhartini Ismail
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia

3. **Associate editors**
   - Sri Padma Sari
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Nana Rochana
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Meidiana Dwidiyanti
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Fatikhu Yatuni Asmara
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia

4. **Managing/technical editors**
   - Asih Nurakhir
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Pradipta Ary Pamungkas
     Faculty of Medicine, Universitas Diponegoro, Indonesia
   - Septi Harni Wahyuningtyas
     Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia

Copyright © 2022, NMJN, p-ISSN 2087-7811, e-ISSN

AIMS AND SCOPE

The Nurse Media Journal of Nursing (NMJN) is an international nursing journal which publishes scientific works of nurses, academics and practitioners. NMJN welcomes and invites original and relevant research articles in nursing as well as reviews (systematic and meta-analysis) and case reports.

This journal encompasses original research articles, reviews (systematic and meta-analysis), and case studies, including:

- Adult nursing
- Emergency nursing
- Gerontological nursing
- Community nursing
- Mental health nursing
- Pediatric nursing
- Maternity nursing
- Nursing leadership and management
- Complementary and Alternative Medicine (CAM) in nursing
- Education in nursing

PUBLICATION INFORMATION

The Nurse Media Journal of Nursing (NMJN) is published three time a year, every April, August and December.

For the year 2022, 3 issues (Volume 12, Number 1 (April), Number 2 (August), and Number 3 (December)) are scheduled for publication.

The journal is published by the Department of Nursing, Faculty of Medicine, Universitas Diponegoro and available at https://medianers.undip.ac.id.

JOURNAL CITATIONS

Scopus ID : 21101019708
CiteScore in Scopus : 0.4 (2021), 1.0 (2022)
SJR in Scimago : Q4
Google Scholar h-index / i10-index : 20/54
Total articles published in Google Scholar : 231
Total citations in Google Scholar (total) : 1830

INDEXING AND ABSTRACTING

The Nurse Media Journal of Nursing has been covered (indexed and abstracted) by the following indexing services:

- Scopus
  (https://www.scopus.com/sourceid/21101019708)
- Science and Technology Index (SINTA Score = S1)
  (https://www.sinta.ristekbrin.go.id/journals/detail?id=914)
- Directory of Open Access Journal (DOAJ).
  (*https://doaj.org/toc/2406-8799?*)
- Google Scholar;
  (*https://scholar.google.co.id/citations?user=Gs6nEgkAAAAJ&hl=en*)
- Portal Garuda/Indonesian Publication Index (IPI);
  (*http://id.portalgaruda.org/?ref=browse&mod=viewjournal&journal=1284*)
- Indonesian Scientific Journal Database (ISJD)
  (*http://isjd.pdii.lipi.go.id/index.php/Direktori-Jurnal.html*)
- ASEAN Citation Index
  (*https://www.asean-cites.org/index.php?r=contents%2Findex&id=9*)
- EBSCO
  (*https://atoz.ebsco.com*)
- Garba Rujukan Digital (GARUDA)
  (*http://garuda.ristekdikti.go.id/journal/view/1284*)
- SHERPA/ROMEO
  (*http://sherpa.ac.uk/romeo/search.php?issn=2087-7811*)
- WORLDCAT
  (*https://www.worldcat.org/search?q=so%3A%22NURSE+MEDIA%22&qt=results_page*)
- Microsoft Academic
  (*https://academic.microsoft.com/journal/2764736586*)
- Crossref
  (*https://search.crossref.org/?q=2406-8799*)
- BASE
  (*https://www.base-search.net*)

TABLE OF CONTENTS

Editorial Team ii
Aims and Scope, Publication Information, Journal Citation iii
Indexing and Abstracting iv
Table of Contents .... v-vi

1. Assessment of Entrepreneurial Leadership among Undergraduate Nursing Students: The Case from Thailand *(Chawapon Sarnkhaowkhom, Siriporn Santre, Payao Phonsuk, Nathatsanan Wongtawee, Siriwimol Piansamer, Ajjita Laohapisitpanich, Wiyada Suriyalerd, Natthakarn Supapote, Thunyathon Kaewmuean, Napakaed Hosangon, Siriphorn Mathaworn, Parichat Phikunthong)* 288-299
2. "A life without a supervisor is like a seed that never grows": Students' Experiences of Undergraduate Nursing Research Supervision *(Olufemi Oyebanji Oyediran, Olamide Hope Olafare, Ifeoluwapo Oluwafunke Kolawole, Emmanuel Olufemi Ayandiran, Iyanuoluwa, Oreofe Ojo, Boluwaji Reuben Fajemilehin)* 300-315
3. The Effect of Mindfulness-Based Stress Reduction on Restless Legs Syndrome in Hemodialysis Patients: A Randomized Clinical Trial *(Zahra Delshad, Mohammad Aghajani)* 316-324
4. Measures of Nursing Environment Multidimensionality and Patient Centricity Using Importance-Performance Map Analysis *(Andy Andy, Salsabilla Maula Zalfa El-Hamzah, Ferdi Antonio)* 325-339
5. Triggers of Workplace Violence in Emergency Departments: A Qualitative Study *(Ibrahim Ayasreh, Ferial Hayajneh, Rana Al Awamleh, Mohammed ALBashtawy, Abdullah Al-Khawaldeh)* 340-352
6. Individual Characteristics, Adherence, and Barriers to Medication Adherence of Hypertensive Patients at the Indonesia - Timor Leste Border *(Pius Almindu Leki Berek, Bambang Budi Siswanto, Dewi Irawati, Wisnu Jatmiko)* 353-366
7. Perceived Stress, Sexual and Marital Satisfaction among Married Healthcare Workers in Nigeria *(Matthew Idowu Olatubi, Olamide Olayinka, Olufemi Oyebanji Oyediran, Grace Oluwaranti Ademuyiwa, Taiwo Omotayo Dosunmu)* 367-379
8. The Effect of Pelvic Rocking Exercise with a Birth Ball and SP6 Acupressure on Duration of the First and Second Stage of Labor *(Karningsih Karningsih, Dwi Purwanti, Fauziah Yulfitria, Gita Nirmala Sari, Een Nuraenah)* 380-389
9. Non-comorbid Respiratory Factor and Work of Breathing in Pediatric COVID-19 Patient: How is Their Synergistic Correlation with the Level of Care? *(Defi Efendi, Maria Dyah Kurniasari, Mega Hasanul Huda, Raudha Ilmi Farid, Yohanes Andy Rias, Yogi Prawira, Nina Dwi Putri, Ayuni Rizka Utami, Titik Ambar Asmarini, Pande Lilik Lestari, Pricilia Mais, Abram Babakal)* 390-403
10. The Associated Factors of Quality of Life among Stroke Survivors: A Study in Indonesia *(Fitria Handayani, Reni Sulung Utami, Chandra Bagus Ropyanto, Niken Safitri Dyan Kusumaningrum, Yuni Dwi Hastuti)* 404-413
11. Relationship between Nurses' Attitudes and Satisfaction with Bedside Shift Reports and Patient Safety Culture *(Samara Jaber, Mirna Fawaz, Ahmad Rayan, Nisser Alhroub, Mohammad Suliman, Mohammed ALBashtawy, Rasmieh Al-Amer, Abdullah Alkhawaldeh)* 414-422

12. The Effect of Music Therapy on Adult Patients' Heart Rate: A Meta-Analysis *(Kamila Alammar, Omar Ghazi Baker, Areej Alotaiba, Amwar Alkhunaizi)* 423-436
13. Targeting Smoking Triggers: A Nurse-led Intervention for Tobacco Smoking Cessation *(Sadeq Al-Fayyadh, Ali Hussein Alek Al-Ganmi, Musaab Majid Abdulwahhab, Shaymaa Mohammed Hussein, Linda Cook, Abdulellah Al-Solais, Mayada Sabri)* 437-451
14. Anatomical Points of Cupping Therapy for Musculoskeletal Pain: A Systematic Review *(Aris Setyawan, Isma Nur Hikmah, Eka Oktavianto, I Made Moh. Yanuar Saifudin)* 452-465

Author Guidelines App.1-9
Copyright Transfer Agreement App.10
Copyright Transfer Agreement Form.......... App.11
Publication Ethics and Malpractice Statement.......... App.12-14
Reviewer Acknowledgment.......... App 15
Submission Information App.16
Subscription Information.......... App.17

[This page is intentionally left blank]

Author Guidelines

1. Focus and scope

The Nurse Media Journal of Nursing (NMJN) is a nursing journal that publishes the scientific works of nurses, academics, and practitioners. NMJN welcomes and invites original and relevant research articles in nursing as well as reviews (systematic and meta-analysis) and case reports.

2. General guidelines

Manuscripts submitted to the journal are not yet published. NMJN does not accept any manuscripts which are also sent to other journals for publication at the same time. The writer should ensure that all members of his/her team have approved the manuscript for publication. Any research report on humans as the subject should enclosure the signed informed consent, and prior ethical approval was obtained from a suitably constituted research ethics committee or institutional review board. If any financial support was received or relationship(s) existed, the authors should mention that no conflict of interest of any financial support or any relationship or other exists during a research project. Those points should mention in the Cover Letter to the Editor of NMJN.

3. Review process

Each manuscript is reviewed by the editors, and if of a sufficient standard, sent for blinded reviewed by at least two editorial board members or reviewers who come from a range of countries as chosen by the journal team based on their expertise. The result may be accepted with no revision, accepted with minor correction, accepted with major revision, and refused. The sending author is given an opportunity to correct the article based on suggestions received from the reviewers. The specific information of whether the article is accepted and published or refused is given to the sending author in written.

4. Manuscript guidelines

The manuscript should be written in English on an essay format which is outlined as follow:

4.1 Title page

This includes the title of the manuscript, the full names without academic and professional credentials with commas between names. In addition, a number (1) is to be used to designate the corresponding author with academic and professional credentials, institutional affiliation(s), postal and email addresses of each author.

4.2 Abstract

Abstract for research articles, reviews, and case reports should use a maximum of 300 words. The abstract should consist of background, purpose, methods, results, and conclusion. The abstract is clearly written and is short to help readers get an understanding of the new and important aspects without reading the whole article. Keywords are written on the same page with abstract separated from each other with a semicolon (;). Please use a maximum of 5 appropriate words for helping with the indexing.

4.3 Manuscript of original research

4.3.1 Introduction

The introduction provides the state of the art of the study and consists of an adequate background, previous research in order to record the existing solutions/method to show which is the best, and the main limitation of previous research, to show the scientific merit or novelties of the paper. Avoid a detailed literature survey or a summary of the results. The purpose of the study should state the major aim of the research and is written at the end of the introduction section.

4.3.2 Methods

Methods should be structured as follow:

4.3.2.1 Research design

Describe the specific research design used, such as correlational, experimental, quasi-experimental, cross-sectional, and others. Provide relevant descriptions regarding the design applied in the study.

4.3.2.2 Setting and samples/participants

State when and where the study was conducted without mentioning the specific name of the research site. Identify the sampling strategy used to recruit the samples/participants as well as the inclusion and exclusion criteria. How samples/participants were recruited should also be stated. Also, identify the sample size (and the population, if applicable) and sample size justification, including sample size calculation or power analysis, if applicable.

4.3.2.3 Intervention (applies to experimental studies)

Describe the intervention, setting, and those who provided the intervention. If the study included a control group, explain what kind of intervention was provided to this group.

4.3.2.4 Measurement and data collection

Mention and describe the instrument used for data collection. Clearly state whether the researchers develop, adopt, or modify the instrument from previous studies, including its citations and references. Mention the validity and reliability of the instrument, the scale, interpretation, and administration. If a translation was conducted from the original language, authors should explain the procedures used to maintain the validity and reliability of the translated instruments. Describe how data were collected. If the data were collected by research assistants, please identify this in the manuscript.

4.3.2.5 Data analysis

Clearly describe the techniques used for data analysis, including the computer software used, if appropriate. Please provide relevant references for specific analytic approaches/ techniques (for qualitative studies).

4.3.2.6 *Trustworthiness*/rigor *(applies to qualitative studies)*

The manuscript should describe strategies used to maintain the trustworthiness/rigor of the qualitative data, such as credibility, transferability, dependability, and confirmability.

4.3.2.7 Ethical considerations

Please describe the ethical issues in the study, including how informed consent was obtained from respondents/participants. Provide a statement of approval from the health research ethics committee, including its reference number.

4.3.3 Results

Results state the major findings of the research instead of providing data in great detail. Results should be clear, concise, and can be reported on texts or graphics. Please provide some introduction for the information presented on tables or figures.

4.3.4 Discussion

The discussion should explore the significance of the results of the study. The following components should be covered in the discussion: (1) How do your results relate to the original question or objectives outlined in the background section (what)? (2) Do you provide an interpretation scientifically for each of your results or findings presented (why)?, and (3) Are your results consistent with what other investigators have reported (what else)? Or are there any differences?

4.3.5 Implication and limitations

The manuscript should describe the implications of the study on nursing practices and policies based on the findings and also the limitations.

4.3.6 Conclusion

Conclusions should answer the research objectives, telling how advanced the result is from the present state of knowledge. Conclusions should be clear in order to know it merits publication in the journal or not. Provide a clear scientific justification and indicate possible applications and extensions. A recommendation should also be pointed out to suggest future research and implication in the nursing practice.

4.3.7 Acknowledgments

Briefly acknowledge research funders and any research participants in this section.

4.3.8 Author contribution

We encourage authors to provide statements outlining their individual contributions or roles to the manuscript.

4.3.9 Conflict of interest

State whether there is a conflict of interest among authors.

4.3.10 Reference

The reference consists of all references used to write the manuscript and adhere to the APA 7th edition. Ensure that citations used are as contemporary as possible, including those from the current year of writing. Delete older literature citations (more than 10 years) unless these are central to your study. The number of references should be at least 30, of which 80% of them should be from journal articles. References should avoid the use of secondary citations. Self-citations are allowed up to 15% of the total references.

4.4 Manuscript of reviews (systematic or meta-analysis)

4.4.1 Introduction

The introduction provides the state of the art of the study and consists of an adequate background, previous research in order to record the existing solutions/method to show which is the best, and the main limitation of previous research, to show the scientific merit or novelties of the paper. Avoid a detailed literature survey or a summary of the results. The purpose of the study should state the major aim of the research and is written at the end of the introduction section.

4.4.2 Methods

Methods should be structured as follow:

4.4.2.1 Research design

Describe the specific research design used: systematic review or meta-analysis. Provide relevant descriptions regarding the design applied in the study.

4.4.2.2 Search methods

Identify the electronic databases searched, keywords, and search methods (range of years). Use a table if necessary to show readers the number of articles you search from each database.

4.4.2.3 Inclusion and exclusion criteria

Identify the inclusion and exclusion criteria for selecting the articles.

4.4.2.4 Screening of articles

Include the reviewers who did the first screening for selection and screening for content analysis.

4.4.2.5 Data extraction

Identify how data were extracted. Please use a table that contains authors' names, year, country name, objective, conceptual framework, sample, design, instrument, and results.

4.4.2.6 Quality appraisal

Include a description of approaches used, the outcome of the appraisal process, and the audit of discarded studies. Make clear the criteria that were used for discarding studies. If the quality appraisal was not undertaken, provide a convincing and robust explanation, and in the limitations section, outline the potential impact on the credibility of the review findings.

4.4.2.7 Data analysis

Explain how you analyze the contents.

4.4.3 Results

Results should include the search outcomes, quality assessment results, and analytical findings. Please describe the search outcome using the PRISMA flow diagram. Describe the results of the assessment as indicated in the method. The analytical findings should be presented using themes, categories, patterns, and so on.

4.4.4 Discussion

The discussion should explore the significance of review findings. Please draw out the applicability, theoretical and practical implications of the findings. Clarify the contribution of the review to existing knowledge, highlight gaps in knowledge and understanding, and outline future research.

4.4.5 Implication and limitations

Provide the implications/ recommendations for policies or practices, as well as the limitations of the review.

4.4.6 Conclusion

The conclusion should summarize important aspects of reviewed studies and evaluate the current state of the literature reviewed, identify significant flaws or gaps in existing knowledge, outline areas for future study, and link your research to existing knowledge.

4.4.7 Acknowledgments

Briefly acknowledge research funders and any parties that contribute to the study.

4.4.8 Author contribution

We encourage authors to provide statements outlining their individual contributions or roles to the manuscript.

4.4.9 Conflict of interest

State whether there is a conflict of interest among authors.

4.4.10 Reference

The reference consists of all references used to write the manuscript and adhere to the APA 7th edition. Ensure that citations used are as contemporary as possible, including those from the current year of writing. Delete older literature citations (more than 10 years) unless these are central to your study. The number of references should be at least 50, and 80% of them should be from journal articles. References should avoid the use of secondary citations. Self-citations are allowed up to 20% of the total references.

4.5 Manuscript of case studies

4.5.1 Introduction

The introduction should explain the background of the case (the rarely found case), including the disorder or nursing problems and usual presentation and progression. It should also include a brief literature review that introduces the case report from the standpoint of those without specialist knowledge in the area. It should also end with a very brief statement of what is being reported in the article. The introduction should be clear, focused, concise, and attract the reader's attention and interest.

4.5.2 Case presentation

Provide a clear picture of the patient's condition and presentation, and it is best presented in chronological order with sufficient detail and explanation, including: (1) patient description (without providing details that could lead to the identification of the patient), (2) case history, (3) physical examination results, (4) results of pathological tests and other investigations, (5) treatment plan, (6) expected outcomes of the treatment plan, and (7) actual outcomes. The author should ensure that all the relevant details are included and unnecessary ones excluded.

4.5.3 Discussion

The discussion is a significant part of case reports and should start by expanding on what has been said in the introduction, focusing on why the case is noteworthy and the problem that it addresses. Discussion should contain major interpretations from the findings and results in comparison to previous studies. The significance of the findings and case presentation should be emphasized in this section against previous findings in the subject area. Also, this section should evaluate the patient case for accuracy, validity, and uniqueness and compare or contrast the case report with the published literature. Finally, the authors should briefly summarize the published literature with recent references.

4.5.4 Implication and limitations

Provide the implications/ recommendations for policies or practices, as well as the limitations of the review.

4.5.5 Conclusions

The conclusion should briefly give readers the key points covered in the case report. It should conclude the case report and how it adds value to the available information. Authors can give suggestions and recommendations to clinicians, teachers, or researchers.

4.5.6 Consent

Clearly state that the patient gave his informed consent for publication, and a statement indicating that should be clearly narrated in the report. In the case of the child, the parent or legal guardian should have consented instead, and if the child is a teenager (<18 years old), then both patient and his parent should have consented.

4.5.7 Acknowledgments

Briefly acknowledge research funders and any parties that contribute to the study.

4.5.8 Author contribution

We encourage authors to provide statements outlining their individual contributions or roles to the manuscript.

4.5.9 Conflict of interest

State whether there is a conflict of interest among authors.

4.5.10 Reference

The reference consists of all references used to write the manuscript and adhere to the APA 7th edition. Ensure that citations used are as contemporary as possible, including those from the current year of writing. Delete older literature citations (more than 10 years) unless these are central to your study. The number of references should be at least 30, and 80% of them should be from journal articles. References should avoid the use of secondary citations. Self-citations are allowed up to 15% of the total references.

5. Tables

Every table is typed in 1 space. The number of tables is systematic as mentioned in the texts and completed with a short title each. Provide an explanation on the footnotes instead of on the title. Please explain on footnotes all non-standards information mentioned in the table. The total table should not be more than 6 tables.

6. Layout

The manuscript is to be written in A4 paper with a margin of at least 2.5 for each using Microsoft Word, Times New Roman font, and single-spaced. Each page is numbered starting from the title until the last page of the manuscript. Please check the text carefully before submission to check for correct content and typographic errors.

7. Word count

Manuscripts submitted to the journal should not exceed 7,000 words, including abstract and references. This word count excludes references for review manuscripts.

8. References

Authors are required to use reference management software in writing citations and references. Reference and citation use bracketed citation (name, year). Direct citation on references should include the page number of the citation. American Psychological Association 7th edition applies in writing the manuscript. See examples of referencing below:

8.1 Journal article

Grady, J. S., Her, M., Moreno, G., Perez, C., & Yelinek, J. (2019). Emotions in storybooks: A comparison of storybooks that represent ethnic and racial groups in the United States. *Psychology of Popular Media Culture, 8*(3), 207–217. https://doi.org/10.1037/ppm0000185

8.2 *Journal article with an article number*

Jerrentrup, A., Mueller, T., Glowalla, U., Herder, M., Henrichs, N., Neubauer, A., & Schaefer, J. R. (2018). Teaching medicine with the help of “Dr. House.” *PLoS ONE, 13*(3), Article e0193972. https://doi.org/10.1371/journal.pone.0193972

8.3 *Whole authored book*

Jackson, L. M. (2019). *The psychology of prejudice: From attitudes to social action* (2nd ed.). American Psychological Association. https://doi.org/10.1037/0000168-000

8.4 *Whole edited book*

Kesharwani, P. (Ed.). (2020). *Nanotechnology based approaches for tuberculosis treatment*. Academic Press.

8.5 *Report by a government agency references*

National Cancer Institute. (2019). *Taking time: Support for people with cancer* (NIH Publication No. 18-2059). U.S. Department of Health and Human Services, National Institutes of Health. https://www.cancer.gov/publications/patient-education/takingtime.pdf

8.6 *Conference proceedings published in a journal*

Duckworth, A. L., Quirk, A., Gallop, R., Hoyle, R. H., Kelly, D. R., & Matthews, M. D. (2019). Cognitive and noncognitive predictors of success. *Proceedings of the National Academy of Sciences, USA, 116*(47), 23499–23504. https://doi.org/10.1073/pnas.1910510116

8.7 *Conference proceedings published as a whole book*

Kushilevitz, E., & Malkin, T. (Eds.). (2016). *Lecture notes in computer science: Vol. 9562. Theory of cryptography*. Springer. https://doi.org/10.1007/978-3-662-49096-9

8.8 *Published dissertation or thesis references*

Kabir, J. M. (2016). *Factors influencing customer satisfaction at a fast food hamburger chain: The relationship between customer satisfaction and customer loyalty* (Publication No. 10169573) [Doctoral dissertation, Wilmington University]. ProQuest Dissertations & Theses Global.

8.9 *Unpublished dissertation or thesis references*

Harris, L. (2014). *Instructional leadership perceptions and practices of elementary* school *leaders* [Unpublished doctoral dissertation]. University of Virginia

9. Screening for plagiarism

The journal applies the policy of screening for plagiarism. All articles in this publication are original: the content (either in full or in part) in each article has not been knowingly republished without specific citation to the original release. A Turnitin plagiarism checker is applied to all submitted papers during initial screening. The journal accepts a maximum similarity index of 20%. Papers leading to plagiarism or self-plagiarism will be immediately rejected.

10. Author fee

All authors should pay for article processing charges (APC) when the manuscript is editorially accepted for publication. The APC is IDR. 2,000,000 (for Indonesian authors) or USD 130 (for non-Indonesian authors). The payment can be made by bank transfer/Paypal. Information regarding the bank/Paypal account is sent via email to the corresponding author.

11. Authorship and changes to authorship

All authors should have made substantial contributions to the manuscript, including (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

Authors should carefully consider the list and order of authors before submitting their manuscripts. Any addition, deletion, or rearrangement of author names should be made only before the manuscript has been accepted and only if approved by the journal editor.

12. Reporting Guidelines

The reporting guidelines endorsed by the journal are listed below:

- Observational cohort, case-control, and cross-sectional studies – STROBE (Strengthening the Reporting of Observational Studies in Epidemiology), http://www.equator-network.org/reporting-guidelines/strobe/
- Qualitative studies – COREQ (Consolidated criteria for reporting qualitative research), http://www.equator-network.org/reporting-guidelines/coreq
- Quasi-experimental/non-randomized evaluations – TREND (Transparent Reporting of Evaluations with Non-randomized Designs), http://www.cdc.gov/trendstatement/
- Randomized (and quasi-randomized) controlled trials – CONSORT (Consolidated Standards of Reporting Trials), http://www.equator-network.org/reporting-guidelines/consort/
- Study of diagnostic accuracy/assessment scale – STARD (Standards for the Reporting of Diagnostic Accuracy Studies), http://www.equator-network.org/reporting-guidelines/stard/
- Systematic review of controlled trials – PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), http://www.equator-network.org/reporting-guidelines/prisma/
- Systematic review of observational studies – MOOSE (Meta-analysis of Observational Studies in Epidemiology), http://www.ncbi.nlm.nih.gov/pubmed/10789670
- Case reports – CASE (Case Report Guidelines), https://www.care-statement.org/

13. Submission

Each submitted manuscript must conform to the Instructions to Authors and should be submitted online at http://ejournal.undip.ac.id/medianers. The instructions for registering, submission, and revision are provided on the website. If any difficulties are found, authors can contact the editorial office via email: media_ners@live.undip.ac.id.

The author should first register as an author and/or is offered as a reviewer through the following address:

http://ejournal.undip.ac.id/index.php/medianers/about/submissions#onlineSubmissions

The author should fulfill the form as detailed as possible where the star-marked form must be entered. After all forms of textbox were filled, the author clicks on the "Register" button to proceed with the registration. Therefore, the author is brought to an online author submission interface where the author should click on "*New Submission.*" In the Start of a New Submission section, click on "*'Click Here': to go to step one of the five-step submission process.*"

The following are five steps in the online submission process:

1. *Step 1 - Starting the Submission:* Select the appropriate section of the journal, i.e., Original Research Articles, Review Article, or Case Report. Thus, the author must check-mark on the submission checklists. The author may type or copy-paste the Covering Letter in Letter to Editor.
2. *Step 2 – Uploading the Submission:* To upload a manuscript to this journal, click Browse on the Upload submission file item and choose the manuscript document file (.doc/.docx) to be submitted; then, click the "Upload" button until the file has been uploaded.

3. *Step 3 – Entering Submission's Metadata:* In this step, detailed authors metadata should be entered, including the marked corresponding author. After that, the manuscript title and abstract must be uploaded by copying the text and paste in the textbox, including keywords.
4. *Step 4 – Uploading Supplementary Files:* Supplementary files should be uploaded, including Covering/Submission Letter and Signed Copyright Transfer Agreement Form. Click on the Browse button, choose the files, and then click on the Upload button.
5. *Step 5 – Confirming the Submission:* The author should final check the uploaded manuscript documents in this step. To submit the manuscript to Nurse Media Journal of Nursing, click the Finish Submission button after the documents are accurate. The corresponding author or the principal contact will receive an acknowledgment by email and will be able to view the submission's progress through the editorial process by logging into the journal web address site.

After this submission, Authors who submit the manuscript will get a confirmation email about the submission. Therefore, Authors are able to track their submission status anytime by logging into the online submission interface. The submission tracking includes the status of the manuscript review and editorial process.

Copyright Transfer Agreement

Authors submitting a manuscript do so on the understanding that if accepted for publication, the copyright of the article shall be assigned to *Nurse Media Journal of Nursing* and Department of Nursing, Faculty of Medicine, Universitas Diponegoro as the publisher of this journal.

Copyright encompasses exclusive rights to reproduce and deliver the article in all forms and media, including reprints, photographs, microfilms, and any other similar reproductions, as well as translations. The reproduction of any part of this journal, its storage in databases, and its transmission by any forms or media, such as electronic, electrostatic, and mechanical copies, photocopies, recordings, magnetic media, and others, will be allowed only with written permission from *Nurse Media Journal of Nursing* and Department of Nursing, Faculty of Medicine, Universitas Diponegoro.

Nurse Media Journal *of Nursing* and Department of Nursing, Faculty of Medicine, Universitas Diponegoro make every effort to ensure that no wrong or misleading data, opinions, or statements be published in the journal. In any way, the contents of the articles and advertisements published in *Nurse Media Journal of Nursing* are the sole and exclusive responsibility of their respective authors and advertisers.

The **Copyright Transfer Agreement Form** can be downloaded at the NMJN website (https://medianers.undip.ac.id). The copyright form should be filled with respect to the article and be signed originally and sent to the Editorial Office in the form of an original email or scanned document file (softcopy) to:

Meira Erawati (Editor-in-Chief)
Nurse Media Journal of Nursing
Department of Nursing, Faculty of Medicine, Universitas Diponegoro
Jl. Prof. Soedarto, Tembalang, Semarang, Central Java, Indonesia 50275
Telp.: +62-24-76480919; Fax.: +62-24-76486849
Email: media_ners@live.undip.ac.id

Copyright Transfer Agreement Form

Name of Principal Author(s) :

Address of Principal Author(s) :

Phone Number / Fax. Number :

Email :

Name of Author (s) :

Title of Manuscript :

1. I/We submit to the Nurse Media Journal of Nursing for the above manuscript. I/We certify that the work reported here has not been published before and contains no materials the publication of which would violate any copyright or other personal or proprietary right of any person or entity.
2. I/We hereby agree to transfer all rights, title, interest, and copyright ownership to Nurse Media Journal of Nursing, Faculty of Medicine, Universitas Diponegoro for the copyright of the above manuscript.

Date : __________________________

Signature (original) : __________________________
(When there is more than one author, only one signature will suffice)

Author’s Name : __________________________

Publication Ethics and Malpractice Statement

Nurse Media Journal of Nursing (NMJN) is a peer-reviewed electronic international journal. This statement clarifies the ethical behavior of all parties involved in the act of publishing an article in this journal, including the author, the chief editor, the editorial board, the peer-reviewers, and the publisher (Universitas Diponegoro). This statement is based on COPE's Best Practice Guidelines for Journal Editors.

1. Ethical guidelines for journal publication

The publication of an article in a peer-reviewed NMJN journal is an essential building block in the development of a coherent and respected network of knowledge. It is a direct reflection of the quality of the work of the authors and the institutions that support them. Peer-reviewed articles support and embody the scientific method. It is therefore important to agree upon standards of expected ethical behavior for all parties involved in the act of publishing: the author, the journal editor, the peer reviewer, the publisher, and the society.

Universitas Diponegoro (Diponegoro University), as the publisher of NMJN, takes its duties of guardianship over all stages of publishing extremely seriously, and we recognize our ethical and other responsibilities. We are committed to ensuring that advertising, reprint, or other commercial revenue has no impact or influence on editorial decisions. In addition, the Department of Nursing Universitas Diponegoro and Editorial Board will assist in communications with other journals and/or publishers where this is useful and necessary.

2. Duties of editor

2.1 Publication decisions

The editor of the NMJN journal is responsible for deciding which articles submitted to the journal should be published. The validation of the work in question and its importance to researchers and readers must always drive such decisions. The editors may be guided by the policies of the journal's editorial board and constrained by such legal requirements as shall then be in force regarding libel, copyright infringement, and plagiarism. The editors may confer with other editors or reviewers in making this decision.

2.2 Fair play

An editor at any time evaluates manuscripts for their intellectual content without regard to race, gender, sexual orientation, religious belief, ethnic origin, citizenship, or political philosophy of the authors.

2.3 Confidentiality

The editor and any editorial staff must not disclose any information about a submitted manuscript to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers, and the publisher, as appropriate.

2.4 Disclosure and conflicts of interest

Unpublished materials disclosed in a submitted manuscript must not be used in an editor's own research without the express written consent of the author.

3. Duties of reviewers

3.1 Contribution to editorial decisions

Peer review assists the editor in making editorial decisions, and through the editorial communications with the author may also assist the author in improving the paper.

3.2 Promptness

Any selected referee who feels unqualified to review the research reported in a manuscript or knows that its prompt review will be impossible should notify the editor and excuse himself from the review process.

3.3 Confidentiality

Any manuscripts received for review must be treated as confidential documents. They must not be shown to or discussed with others except as authorized by the editor.

3.4 Standards of objectivity

Reviews should be conducted objectively. Personal criticism of the author is inappropriate. Referees should express their views clearly with supporting arguments.

3.5 Acknowledgment of sources

Reviewers should identify relevant published work that has not been cited by the authors. Any statement that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation. A reviewer should also call to the editor's attention any substantial similarity or overlap between the manuscript under consideration and any other published paper of which they have personal knowledge.

3.6 Disclosure and conflict of interest

Privileged information or ideas obtained through peer review must be kept confidential and not used for personal advantage. Reviewers should not consider manuscripts in which they have conflicts of interest resulting from competitive, collaborative, or other relationships or connections with any of the authors, companies, or institutions connected to the papers.

4. Duties of authors

4.1 Reporting standards

Authors of reports of original research should present an accurate account of the work performed as well as an objective discussion of its significance.

Underlying data should be represented accurately in the paper. A paper should contain sufficient detail and references to permit others to replicate the work. Fraudulent or knowingly inaccurate statements constitute unethical behavior and are unacceptable.

4.2 Data access and retention

Authors are asked to provide the raw data in connection with a paper for editorial review and should be prepared to provide public access to such data (consistent with the ALPSP-STM Statement on Data and Databases), if practicable, and should, in any event, be prepared to retain such data for a reasonable time after publication.

4.3 Originality and plagiarism

The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted.

4.4 Multiple, redundant or concurrent publication

An author should not, in general, publish manuscripts describing essentially the same research in more than one journal or primary publication. Submitting the same manuscript to more than one journal concurrently constitutes unethical publishing behavior and is unacceptable.

4.5 Acknowledgment of sources

Proper acknowledgment of the work of others must always be given. Authors should cite publications that have been influential in determining the nature of the reported work.

4.6 Authorship of the paper

Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

4.7 Hazards and human or animal subjects

If the work involves chemicals, procedures, or equipment that have any unusual hazards inherent in their use, the author must clearly identify these in the manuscript.

4.8 Disclosure and conflicts of interest

All authors should disclose in their manuscript any financial or other substantive conflicts of interest that might be construed to influence the results or interpretation of their manuscript. All sources of financial support for the project should be disclosed.

4.9 Fundamental errors in published works

When an author discovers a significant error or inaccuracy in his/her own published work, it is the author's obligation to promptly notify the journal editor or publisher and cooperate with the editor to retract or correct the paper.

Reviewer Acknowledgment

Nurse Media Journal of Nursing (NMJN) appreciates the reviewers (alphabetically ordered) who have commented the manuscripts for the present volume (volume 11, 2021):

Anggorowati : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Ashokka Balakrishnan : National University Hospital, Singapore
Asih Nurakhir : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Cyrus P. Tuppal : St. Paul University, Philippines
Elnaz Asghari : Faculty of Nursing and Midwifery, Tabriz University of Medical Sciences, Iran
Eni Nuraini Agustini : UIN Syarif Hidayatullah, Indonesia
Fatikhu Yatuni Asmara : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Faustino Jerome G. Babate : Beta Nu Delta Nursing Society, Philippines
Fitria Handayani : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Fitri Mailani : Faculty of Nursing, Universitas Andalas, Indonesia
Forouzandeh Jannat : Tehran University of Medical Sciences, Tehran, Iran
Janet Alexis A. De los Santos : College of Nursing, Visayas State University, Philippines
Luky Dwiantoro : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Mansour Ghafourifard : Faculty of Nursing and Midwifery, Tabriz University of Medical Sciences, Iran
Mardiyono Mardiyono : Department of Nursing, Poltekkes Kemenkes Semarang, Indonesia
Megah Andriany : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Meidiana Dwidiyanti : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Meira Erawati : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Nana Rochana : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Niken S. D. Kusumaningrum : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Nur Setiawati Dewi : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Ric-An Artemio S. Gadin : Beta Nu Delta Nursing Society, Philippines
Rizki Fitryasari : Faculty of Nursing Universitas Airlangga, Indonesia
Ryan Michael F. Oducado : College of Nursing, West Visayas State University, Philippines
Sadeq AL-Fayyadh : College of Nursing, University of Baghdad, Iraq
Sri Padma Sari : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Suhartini Ismail : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Untung Sujianto : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia
Zubaidah Zubaidah : Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Indonesia

Submission Information

All manuscripts should be submitted to the NMJN editorial office by the online submission and tracking interface at: https://medianers.undip.ac.id.

The following materials should accompany the submitted manuscripts to the editorial office:

(1) Signed *Copyright Transfer Agreement Form* (a copy reproduced from the website);
(2) A *Covering Letter* outlines the basic findings of the paper and their significance, which are uploaded as supplementary materials (Step 4) in the submission interface.

However, if for any reason authors are unable to use the above methods, authors may also contact the editorial office according to the following address for technical assistance:

Meira Erawati (Editor-in-Chief)

Nurse Media Journal of Nursing
Department of Nursing, Faculty of Medicine, Universitas Diponegoro
Jl. Prof. Soedarto, Tembalang, Semarang, Central Java, Indonesia 50275
Telp. +62-24-76480919; Fax. +62-24-76486849
Email: media_ners@live.undip.ac.id

Three types of manuscripts are acceptable for publication in the NMJN: original research articles, reviews (systematic and meta-analysis), and case reports.

Preparation of manuscripts

Manuscript of the research article, case study, or reviews should be prepared in the 'camera ready' templates, according to the guidelines on the website:
http://ejournal.undip.ac.id/index.php/medianers/about/submissions

Reviewing of manuscripts

Every submitted manuscript is independently reviewed by at least two peers. The decision for publication, amendment, or rejection is based upon their reports. If two or more reviewers consider a manuscript unsuitable for publication in this journal, a statement explaining the basis for the decision will be sent to the authors within three months of the submission date. The rejected manuscripts will not be returned to the authors.

Revision of manuscripts

Manuscripts sent back to the authors for revision should be returned to the editor without delay (not later than one month). The revised manuscripts should be sent to the editorial office through the online submission interface. The revised manuscripts returned later than three months will be considered as new submissions.

Subscription Information

The Nurse Media Journal of Nursing is available on its online version that is freely accessible and printed version that can be obtained upon request. Individuals or institutions that are interested in subscribing to the printed journal should contact the editorial office. Please note that subscription fee and shipping cost is applied to this type of subscription.

Please send the following information to the editorial office via email for subscription.

The undersigned below:

Complete name : ....

Address (home) : ....
....
City..............................Country...
Phone no............................, email...

Address (institution) : ....
....
....
City..............................Country...
Phone no................................, email.......................................

is to subscribe to the Nurse Media Journal of Nursing (NMJN), for *

☐ Annual subscription (3 Issues: April, August, and December)
☐ Non-annual subscription (per issue).

The payment is transferred to:

BNI Bank of UNDIP Branch, Semarang
Account no: 0331871212
Account holder: Septi Harni Wahyuningtyas
SWIFT code: BNINIDJA (outside Indonesia)

The subscribed journal is sent to*:

☐ Home address
☐ Institution address

This subscription is made for year..............to.............. (...... years), ... exemplars per issue.

Signed in ....
Date...

(signature and name)

- Please send the filled form along with the payment receipt to the editorial office of NMJN via email: media_ners@live.undip.ac.id
- In the case of (*), choose one