Nurse Media

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Articles

- Filipino Nursing Students' Health Promoting Behaviors during Pandemic
- Women's Knowledge of Sexually Transmitted Diseases in Telafer City, Iraq
- Correlating Demographics and Well-being among Rural College Students in the Philippines
- Resilience-related Breast Cancer: A Concept Analysis
- Parents' Experiences of Caring for Children with Congenital Rubella Syndrome (CRS) in Remote and Rural Areas of Indonesia
- Effects of Patient and Family-Centered Care on Quality of Care in Pediatric Patients: A Systematic Review
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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.

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Total citations in Google Scholar (total) : 2007

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)
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- Directory of Open Access Journal (DOAJ).
  (*https://doaj.org/toc/2406-8799?*)
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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.

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ORIGINAL RESEARCH

Filipino Nursing Students' Health Promoting Behaviors during Pandemic

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Abstract

Background: Research on health promoting behaviors can assist nursing students in identifying, maintaining, and improving health behaviors. The notable impact and changes in lifestyle behaviors during the pandemic necessitate a closer look into students' health-promoting behaviors. However, there is a lacuna in the literature about health promoting activities of nursing students stuck at home and attending online learning during the pandemic.
Purpose: This study assessed the level and predictors of health promoting behaviors of nursing students in a Philippine public university during a pandemic.
Methods: This study used a cross-sectional design with 363 out of 531 undergraduate nursing students of a public university in the Philippines as study participants. Data were gathered using an online survey last March 2022 employing the Health Promoting Lifestyle Profile (HPLP) II. Significant predictors were identified using multiple linear regression analysis with the aid of SPSS version 26.0.
Results: Results showed that nursing students had a high (M=2.80 out of 5) practice of health promoting behaviors. Physical activity ranked the lowest among the six dimensions of health promotion behaviors. The variables that predicted the health promoting behaviors of nursing students were self-reported academic performance (β=2.110, *p*=.000), family income level (β=.055, *p*=.001), and academic year level (β=.057, *p*=.002).
Conclusion: Nursing students should continue to maintain their good practice of health promoting behaviors. However, more attention should be given to engaging in physical activity to maintain holistic well-being.

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1. Introduction

Healthy lifestyle promotion is an important factor of health status (Almutairi et al., 2018; Wei et al., 2012). Health promotion combines educational, social, and environmental efforts to promote healthy lifestyles and habits (Kim & Kim, 2018). It is designed to aid people in achieving their full potential in terms of physical, mental, social, and spiritual health (Kim & Kim, 2018; Shariferad et al., 2013). Moreover, health promoting behaviors involves a positive living approach and a way of boosting well-being and increasing self-actualization (Nassar & Shaheen, 2014; Wang et al., 2009). Health promoting behavior is an ever-present factor in the lives of university students, many of whom have varying lifestyles and practices (Al-Momani, 2021; Almutairi et al., 2018; Ashgar, 2021). Individuals can choose whether they want to improve their lifestyles and have several methods or means they can choose from (National Institute of Health, 2021). Health promoting behaviors, especially those of students, have been researched many times throughout the years, and studies found that those with good health promoting behaviors have better healthy lifestyles (Al-Momani, 2021; Hwang & Oh, 2020).

With the advent of the COVID-19 pandemic, restrictions, and quarantine practices were implemented to control and prevent the spread of the COVID-19 virus (Mattioli et al., 2020). The pandemic has impacted all sectors, including nursing education (Agu et al., 2021). As the crisis worsened, many governments shut down schools, colleges, and institutions to protect students, teachers, and their countries (Schleicher, 2020). As a means of maintaining and safeguarding the overall health of students and teachers, traditional in-person classes, skills laboratories, and student clinical or hospital placement were either suspended or restricted when the pandemic broke out and education shifted to online mode (Agu et al., 2021; Oducado & Soriano, 2021).

Meanwhile, multiple studies have already been conducted related to the health promoting behaviors of university students in pre-pandemic conditions (e.g., Al-Momani, 2021; Alzahrani et al., 2019; Ashgar, 2021; Fashafsheh et al., 2021; Hosseini et al., 2014; Hwang & Oh, 2020; Polat et al., 2016), particularly nursing students, and the factors affecting it. Mixed results were found with other studies reporting high (Hosseini et al., 2014), while others disclosing only moderate levels (Fashafsheh et al., 2021; Farokhzadian et al., 2018; Polat et al., 2016) of health promoting behaviors. However, to the researchers' best knowledge, there is a lacuna in published literature touching on the health promoting behaviors of nursing students in the pandemic setting.

COVID-19 dramatically impacted lifestyle behavior (Azzouzi et al., 2022). A closer look at the lifestyle of students is necessary as lifestyle is considered a key factor for the onset and course of diseases (Van der Werf et al., 2021). Results of studies among the general population and university students conducted elsewhere indicated changes in the lifestyle during the pandemic, such as physical inactivity, faulty eating patterns, and increased mental stress (Gadi et al., 2022; Li et al., 2021; Singh et al., 2021). Online classes and restrictions related to quarantine inhibited students from practicing self-care and good health habits during the worldwide health crisis (Cleofas, 2021). During this research, the students were still living within the pandemic context. Previous studies have not touched on health promoting activities of nursing students stuck at home and attending online learning during the pandemic. It must be noted that while the survey was done towards the end of the pandemic and there was already some relaxation with COVID-19-related restrictions in other parts of the world, the conditions in which the study was conducted have not returned to its pre-pandemic state. Also, students in this study have not yet returned to on-campus instruction.

Meanwhile, Walker et al. (1987) identified six lifestyle behaviors that promote health. These include health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations, and stress management. The Health Promotion Model (Walker et al., 1987) assumes that demographic or personal characteristics may influence health promoting behaviors. Differentiation of behaviors that promote health by certain demographic constructs may help identify vulnerable student cohorts that may be targeted for health programs and interventions (Muller et al., 2022). It is argued that university life of students can be a crucial time in promoting the good and changing the unhealthy lifestyle behaviors of students (Cetinkaya & Sert, 2021). Given that the majority of lifelong good and ill lifestyle behaviors are formed throughout adolescence and continue to affect health even after early adulthood, it is critical to establish good health-related habits and disease prevention measures for teenagers and young adults (Fish & Nies, 1996; Musavian et al., 2014). Furthermore, the researchers recognized that it is vital to support students in developing and adopting behaviors that will maintain, improve and preserve their health and well-being and assist them in making sound health decisions (Ross et al., 2017). Nurses recognize the importance of a healthy balanced diet, stress management, adequate sleep, physical activity, and healthy relationships; this understanding, however, may not convert into self-care for nurses as they may not adhere to suggested physical activity and nutrition requirements (Ross et al., 2017). The same can be said about nursing students, especially if they are overburdened with assignments and classes (Chaabane et al., 2021).

As healthcare professionals in the future, nursing students have a vital role in public health for others and their own well-being and fitness (Hwang & Oh, 2020). Therefore, this study focused on how several factors involved in the lives of undergraduate nursing students affect their practice of health promoting behaviors, especially during the pandemic. The result of this study, based on student responses, could help inform university policymakers on ways to create healthier campuses, especially in nursing colleges. Hence this research was conducted to assess the level of practice and significant predictors of the health promoting behaviors among undergraduate nursing students during a pandemic.

2. Methods

2.1 Research design

This study was completed through the use of a descriptive cross-sectional research design.

2.2 Setting and samples

A complete or total enumeration was utilized in the study, wherein the acceptable response rate is 60% and above (Bennett et al., 2011; Fincham, 2008). All 531 undergraduate students from levels one to four of a public College of Nursing in the Philippines were invited to participate in the study. The college offers a four-year baccalaureate degree program and is the only public university within the Province of Iloilo. Out of 531 students, 363 responses (68.36%) responded. A-priori sample size using G*Power (Kang, 2021) for multiple regression with eight and nine predictors, .80 desired statistical power, and .15 anticipated effect size only requires a minimum sample of 108 and 113, respectively. The subjects included in this study were officially enrolled students of the college in the second semester of 2022 and were willing to participate in the study. The five students who were part of the research team of this present investigation were excluded.

2.3 Measurement and data collection

Data collection was done through a two-section questionnaire. The instrument was administered in the English language as the medium of instruction in Philippine Nursing schools is English. The first part included six socio-demographic questions (gender, academic year level, family income level, presence of medical condition, location of residence, and the number of people in the household) as well as the perceived academic performance of the student, COVID-19 infection history, and COVID-19 vaccination status. The second part consisted of the Health Promoting Lifestyle Profile (HPLP) II questionnaire (Walker et al., 1987). The researchers had permission to download and use the HPLP II for non-commercial data collection purposes. The HPLP II tool consists of 52 items categorized into six subscales: health responsibility (9 items), physical activity (8 items), nutrition (9 items), spiritual growth (9 items), interpersonal relations (9 items), and stress management (8 items). A Likert-type scale was used to measure each behavior, with ranges of never (1), sometimes (2), often (3), and routinely (4). The following scale of means based on the work of Beliran and Legaspi (2014) was followed for the interpretation of this study: Very Low (1.00-1.50), Low (1.51-2.50), High (2.51-3.50), and Very High (3.51 - 4.00). HPLP II had a Content Validity Index of 1.00 and a Cronbach's alpha result of .83 (Tejada, 2019). In addition, the researchers have also tested the internal consistency of the instrument based on the actual data and revealed that the results of Cronbach's alpha were the following: .81 for health responsibility, .85 for physical activity, .71 for nutrition, .86 for spiritual growth, .80 for interpersonal relations, .78 for stress management and .94 for the entire scale.

To gather data, the researchers secured permission and approval from the Office of the Dean and the respective Division Chairpersons per year level to conduct the study last March 2022. Afterwards, the chairpersons of the student curriculum of each level were asked to contact the class chairpersons of each section through messenger or email. They were requested to post the link in their respective class Facebook group chats or group pages. The students were encouraged to forward the link to their classmates through messaging or emailing apps to maximize the response rate. To ensure that only the study participants were given access to the survey link, the Google Forms were restricted to university users and were only distributed to college students included in the study. The link included the electronic informed consent. The participants had to click on the box that stated their voluntary participation. Then they had to click "next" to be directed to the research survey questionnaire. When the expected response rate was reached, the participants' responses were monitored, consolidated, and organized using Google Sheets. The data was then classified, tallied, interpreted, and processed.

2.4 Data analysis

Statistical computations were calculated using IBM SPSS version 26. Data were described using descriptive statistics. A test for normality of data distribution using the Kolmogorov - Smirnov Test was done. The t-test for Independent Samples and one-way ANOVA were used to test the difference between categories of the independent variable. Multiple regression analysis (step-wise) was employed to identify significant predictors. The significance level was set at .05 alpha.

2.5 Ethical considerations

The researchers submitted this study to the West Visayas State University Unified Research Ethics Review Committee (URERC), and it was approved with URERC Protocol Number

WVSU.URERC-2022.CONS_001. Electronic informed consent was used, and the participants were allowed to withdraw from the study without feeling obligated to continue. Moreover, there were no repercussions for those who did not participate since this was not a mandatory survey. The consolidated data were only made accessible to the researchers.

3. Results

3.1 Profile of participants

A total of 363 responses were included in this analysis. It can be gleaned from Table 1 that the majority of the participants were female (71.6%), from the lower middle-income class (28.4%), had four (4) or less number of family members in the household (49.0%), residing in towns (52.9%), have average academic performance (81.0%), reported no medical condition (77.7%), and have not been infected with COVID-19 (88.4%). Almost all (99.2%) are fully vaccinated. There were nearly an equal number of students per year except for Level IV (20.4%).

Table 1. Profile of participants (n=363)

Profile	f	%
Gender		
Male	103	28.4
Female	260	71.6
Year level		
Level I	94	25.9
Level II	95	26.2
Level III	100	27.5
Level IV	74	20.4
Family income level		
Poor to low-income	87	24.0
Lower middle-income	103	28.4
Middle middle-income	87	24.0
Upper middle-income	47	12.9
Upper-income to rich	39	10.7
Number of family members in household		
Currently not living with family members	21	5.8
4 or less	178	49.0
5 or more	164	45.2
Medical condition		
No	282	77.7
Yes	81	22.3
Location of residence		
City	171	47.1
Town	192	52.9
Academic performance		
Failing	3	.8
Below average	47	12.9
Average	294	81.0
Above average	19	5.2
Vaccination status		
Fully vaccinated	360	99.2
Partially vaccinated	2	.6
Unvaccinated	1	.3
COVID-19 status		
No	321	88.4
Yes	42	11.6

3.2 Level of health promoting behaviors

Table 2 shows that the majority (73.8%) had a high level of overall health promoting behaviors with a mean score of 2.80 (SD=.40). In terms of subscales, interpersonal relations (*M*=3.18, SD=.46) had the highest mean, followed by spiritual growth (*M*=3.11, SD=.53), stress management (*M*=2.79, SD=.50), health responsibility (*M*=2.63, SD=.54), and nutrition (*M*=2.56, SD=.46). Meanwhile, physical activity (*M*=2.47, SD=.65) had the lowest mean.

Table 2. Level of health promoting behaviors of nursing students (n=363)

Level	Very low		Low		High		Very High		*M*	SD
	f	%	f	%	f	%	f	%		
Overall HPB	2	.6	80	22	268	73.8	13	3.6	2.80	.40
Interpersonal Relations	1	.3	24	6.6	243	66.9	95	26.2	3.18	.46
Spiritual Growth	4	1.1	40	11.0	229	63.1	90	24.8	3.11	.53
Stress Management	5	1.4	109	30.0	228	62.8	21	5.8	2.79	.50
Health Responsibility	8	2.2	139	38.3	193	53.2	23	6.3	2.63	.54
Nutrition	4	1.1	167	46.0	187	51.5	5	1.4	2.56	.46
Physical Activity	29	8.0	176	48.5	138	38.0	20	5.5	2.47	.65

3.3 Differences in health promoting behaviors

Table 3 shows the differences in health promoting behaviors of nursing students using t-test for Independent Samples and ANOVA. Results of statistical analysis revealed that there was a significant difference in the overall health promoting behaviors of nursing students when grouped according to academic year level (F=3.817, *p*=.010), family income level (F=2.773, *p*=.027), and self-reported academic performance (F=12.473, *p*=.000).

Table 3. Differences in health promoting behaviors of nursing students (n=363)

Profile	M	SD	Test Statistics	*p*-value
Gender			-1.875	.062
Male	2.86	.46		
Female	2.77	.38		
Year Level			3.817	.010*
Level I	2.73	.41		
Level II	2.76	.41		
Level III	2.79	.39		
Level IV	2.93	.39		
Family Income Level			2.773	.027*
Poor to low-income	2.70	.41		
Lower middle-income	2.77	.39		
Middle middle-income	2.82	.43		
Upper middle-income	2.90	.38		
Upper-income to rich	2.88	.36		
Number of family members			1.801	.167
Currently not living with family	2.94	.39		
4 or less	2.77	.42		
5 or more	2.81	.39		
Medical condition			-.681	.496
No	2.79	.40		
Yes	2.82	.42		
Location of residence			-.115	.909
City	2.79	.44		
Town	2.80	.37		
Academic Performance			12.473	.000*
Failing to Below Average	2.56	.43		
Average	2.82	.39		
Above Average	2.99	.33		
COVID-19 status			-1.508	.132
No	2.78	.41		
Yes	2.88	.37		

**p<.05*

4. Predictors of health promoting behaviors

Table 4 shows that multiple regression analysis using step-wise method revealed that self-reported academic performance (β=2.110, *p*=.000), family income level (β=.055, *p*=.001), and academic year level (β=.057, *p*=.002) were significant predictors of nursing students' health promoting behaviors accounting for 11.4% of the variance.

Table 4. Regression analysis of health promoting behaviors (n=363)

Model	β Coefficients	t	*p*-value
(Constant)	2.110	20.336	.000*
Academic performance	.213	4.827	.000*
Family Income Level	.055	3.474	.001*
Year Level	.057	3.045	.002
Gender	.073	1.465	.144
Number family members	.000	.010	.992
Medical condition	.033	.658	.511
Location of residence	.052	1.028	.305
COVID-19 status	.038	.756	.450

Note: $R^2 = .114$; F = 15.370; *p* = .000

4. Discussion

This study assessed the level of practice and significant predictors of health promoting behaviors among undergraduate nursing students during a pandemic. This study demonstrated that self-reported academic performance, family income level, and academic year level significantly predicted nursing students' health promoting behaviors.

In this study, the majority of nursing students have not been diagnosed or experienced being infected with COVID-19. This may be due to the students and community members' strict implementation of safety precautions (Tuppal et al., 2021). A study by Rabacal et al. (2022) indicated that higher education students from Western Visayas region of the Philippines generally had a high practice of COVID-19 preventive measures. Nursing students were concerned about their well-being and their families during the pandemic (Barrett, 2022) and thus practiced COVID-19 preventive measures to reduce the chances of acquiring the disease. The suspension of face-to-face teaching and learning and clinical experiences may also have benefited nursing students, reducing the chances of COVID-19 transmission (Agu et al., 2021; Oducado & Soriano, 2021).

It is also significant to note that nursing students in this study had very high COVID-19 vaccination rates. Based on their background in nursing, nursing students could understand the necessity, effectiveness, and safety of the COVID-19 vaccine, as evidenced by their willingness to get the vaccination (Jiang et al., 2021). Furthermore, the study of Oducado et al. (2022) disclosed that nursing students highly intend to attend face-to-face classes. During data collection, only vaccinated students of higher education institutions were allowed to join limited face-to-face classes.

In this study, while very high practice was deemed most desirable, the health promoting behaviors of student nurses were still found to be high. This result is similar to the study of Hosseini et al. (2014), which showed that Tehran-based nursing students' health promoting behaviors scored high. On the contrary, studies conducted by Fashafsheh et al. (2021) in Palestine, Polat et al. (2016) in Turkey, and Farokhzadian et al. (2018) in Iran showed that nursing students had a moderate degree of health promotion. The variation with other related studies and this research may be due to how the mean was interpreted as the interpretation of a "moderate" corresponds to "high" in terms of this study's scale of means. Nevertheless, it is noteworthy that nursing students practice health promoting behaviors to a moderate to a great extent, although improvements can also still be made.

Moreover, in this study, the overall mean score was highest in the subscale of interpersonal relations. This could be due to the students spending most of their time with their classmates, who are also their friends, even on the online platform. Also, the school and the college provide a range of extracurricular activities that could strengthen student camaraderie despite the virtual setup. The relationships among nursing students are recognized by them as being crucial to their learning in clinical practice, as a forum for their feelings of safety and decreased anxiety while learning together. Peer learning has shown positive experiences when the students support each other in knowledge development (Holst et al., 2017; Stenberg & Carlson, 2015).

In addition, spiritual growth was also rated high by the respondents. This could be attributed to the educational institution, which offers a wide range of spiritual formation activities such as regular masses and recollections, including the various religious organizations open to nursing students. This result is similar to the study by Tejada (2019) in the Philippines, which showed that among 118 regular nursing students, the highest means were spiritual growth and interpersonal relations. Moreover, other studies by Alzahrani et al. (2019) among medical students in Saudi Arabia, Fashafsheh et al. (2021) among nursing students in Palestine, Polat et al. (2016) among nursing students in Turkey, Farokhzadian et al. (2018) among nursing and midwifery school in Iran, Hosseini et al. (2014) among nursing students in Tehran, Shaheen et al. (2015) among university students in Jordan, and Al-Momani (2021) among medical students in Saudi Arabia revealed that the greatest mean in the spiritual growth dimension.

On the other hand, physical activity had the lowest mean that was reported in this study. It is significant to note that 48.5% had low and 8.0% had very low physical activity. Other studies conducted pre-pandemic by Alzahrani et al. (2019), Cetinkaya and Sert (2021), Farokhzadian et al. (2018), Fashafsheh et al. (2021), Hosseini et al. (2014), Polat et al. (2016), and Shaheen et al. (2015) showed that physical activity similarly had the lowest mean. Fashafsheh et al. (2021) explained that regular exercise routines still need to be fully absorbed into daily life as leisure activities. During the pandemic, accessing sports equipment and facilities was challenging due to lockdowns and restrictions on physical mobility. Also, with the advent of the pandemic and online classes, students spend most of their time in front of their computers and gadgets (Oducado et al., 2021), further limiting their physical activity. Other variables that may hinder physical activity include poor time management and a disregard for the negative effects of immobility (Thivel et al., 2018).

This study demonstrated that year level predicted the overall level of practice of health promoting of nursing students. Post-hoc analysis revealed that level IV or senior students had significantly higher overall health promoting behaviors than level 1 or first-year (*p*=.008) and level 2 or second-year (*p*=.040) students. Similarly, the study of Polat et al. (2016) found that the mean total score of fourth-year students was significantly higher than the other year levels. A significant difference in health promoting behaviors based on the academic level was also noted in other studies conducted elsewhere (Cetinkaya & Sert, 2021; Muller et al., 2022). And while some scholars pointed out that sedentary lifestyle tends to increase with age especially after early adolescence (Tamanal & Kim (2020), it may also be that students in higher academic year levels have acquired more valuable information about the importance of practicing healthy lifestyle and deleterious health outcome of sedentary behavior. College students' drive to modify their lifestyle by gaining additional health knowledge while studying health-related courses may be one factor (Mašina et al., 2017). These may help explain why higher academic levels have better health behaviors than those in the lower academic years.

Also, this study found that the practice of health promoting behaviors of nursing students was influenced by family income. Post-hoc analysis revealed that the upper middle-income class had significantly higher overall health promoting behaviors than the poor to low-income class (*p*=.046). This finding is supported by the study of Shaheen et al. (2015), whose findings indicated a statistically significant positive association between monthly family income and the average score on all subscales of health promoting behaviors among university students in Jordan. Socio-economic variation in healthy lifestyle was also noted among university students in Europe (Cicchella et al., 2022). In addition, Ashgar (2021) also found that among adults in Saudi Arabia, those with stable income were more likely to adopt one or more of the health promoting behaviors. The study of Nacar et al. (2014) also noted that health promoting behaviors were higher for those with better economic situations among medical students in Turkey. Money directly influences health through the services and goods people purchase, either helping or harming their health.

Finally, this study demonstrated that perceived academic performance predicted the overall level of practice of health promoting behaviors of nursing students. Results reveal that those with above-average academic performance (*p*=.000) and average academic performance (*p*=.000) had significantly higher overall health promoting behaviors than those with failing to below-average academic performance. This finding is supported by the studies of Heidari et al. (2017) and

Tamanal & Kim (2020), wherein academic performance was positively related to a healthier lifestyle: the higher the academic achievement, the more the student practices a health promoting lifestyle. Students with high academic performance have lifestyle habits that positively affect their health, including lessening their screen time, regular eating and sleeping schedules, and decreased social media use (Dubuc et al., 2019). Habits that promote the students' academic performance could also promote their well-being. High academically performing students know how to plan effectively, pay attention to their schedules, set attainable goals, and know when they need activity and rest.

5. Implications and limitations

The study results provide several important implications concerning the practice of health promoting behaviors of nursing students. Since health-related habits continue to affect health after early adulthood, establishing positive health behaviors among college-age students is crucial since altering behavioral patterns in early adulthood is easier. It is vital to identify the level and factors influencing health promoting behaviors to improve and encourage health promoting behaviors among college students. Future healthcare practitioners, such as nursing students, will be crucial in educating patients on good lifestyle choices and serving as role models for healthy living. Nursing students must maintain and promote their personal and professional health. The study findings will also be instrumental in designing and implementing strategies and programs to promote students' health and exploring modification of school policies and environments to help students maintain and encourage their practice of health behaviors.

This study has limitations. The study only focused on the practices of health promoting behaviors reported by nursing students with respect to the six subscales of the HPLP II. The study was limited to undergraduate nursing students in one nursing college in the Philippines. The conclusions drawn from this study cannot be extended to other nursing students who are not included in the sample. Furthermore, because this study utilized a descriptive cross-sectional design, it could not infer causality between variables or follow changes over time. Given the use of online survey questionnaires, self-report bias, subjectivity, and social desirability were also limitations of this study. This study only included selected predictors, and there may also be other factors that may influence health promoting behaviors not included in this study.

6. Conclusion

This study highlights that while nursing students frequently incorporate health promoting behaviors into their lifestyle, they still seldom engage in physical activities, and regular exercise routines are still not fully integrated into daily activities. Also, this study underscores that certain personal characteristics, such as perceived academic performance, academic year level, and family income influence nursing students' health-promoting behaviors. Nursing students should continue to maintain their health-promoting behavior, and focus should be given to incorporating any form of physical activity into their daily schedule to keep active and maintain holistic well-being.

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Author contribution

All authors 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

Authors declare no conflict of interest.

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ORIGINAL RESEARCH

Women's Knowledge of Sexually Transmitted Diseases in Telafer City, Iraq

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Abstract

Background: Knowledge of sexually transmitted diseases (STDs) is essential in protecting women from the devastating effects of these infections. This is the first study that attempts to assess the knowledge about one of the most embarrassing diseases in women with Islamic Turkmen culture.
Purpose: This study aimed to assess women's knowledge of STDs in Telafer City and its association with sociodemographic factors.
Methods: This cross-sectional study involved 451 women over 18 years old from Telfer City in Iraq. The study was conducted using a convenient sampling technique from 1 December 2021 to 15 June 2022. The study's data were collected using a STDs knowledge questionnaire. Descriptive statistics of mean, standard deviation, frequency, and percentage were used to describe sociodemographic characteristics and the level of knowledge of STDs among women. In addition, the inferential statistics of ANOVA and Fisher's exact test were used to determine the association between the women's characteristics and knowledge.
Results: The study signaled that the overall mean score of knowledge of STDs was (6.67±5.85). The vast majority of participants had a low level of knowledge about STDs (73.8%; n=333). Only about (14.4%; n=64) had moderate knowledge, and approximately (11.8%; n=53) of women were highly knowledgeable about STDs. The study also proved the presence of a statistically significant positive association between women's knowledge regarding STDs with marital status ($p<0.000$) and educational level ($p<0.000$).
Conclusion: The majority of respondents showed low level of knowledge about STDs. Marital status and educational level were associated with this knowledge. This study necessitates the construction and employment of a women-tailored health education program about STDs in Iraq and Telafer City.

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1. Introduction

Despite the Covid-19 pandemic, epidemiological surveillance systems and the World Health Organization (WHO) made it clear that there are terrible infections of up to one million people per day with sexually transmitted diseases (STDs) around the world (Centers for Disease Control and Prevention, 2020; World Health Organization, 2021). Women constitute the largest proportion of these infections (Daiane de Peder et al., 2020; Richner, 2022). This huge prevalence of STDs has made these infections a preoccupation for public health systems and women's healthcare organizations in many countries, especially the developing ones (Zheng et al., 2022).

Unfortunately, the Iraqi health surveillance systems do not provide complete epidemiologic data about the prevalence and incidence of STDs in the country. Despite the scarcity of these data, some factors increase the likelihood of STD occurrence among Iraqi women, such as war, displacement, poverty, unemployment, and illiteracy. This possibility of high STD prevalence is reinforced by some studies conducted in a number of Iraqi governorates during the past decade. These studies revealed that the female-to-male ratio of STD is (8:1) and the rates of infection with Chlamydia, Trichomoniasis, and syphilis among women reached about, (58.2%, 3.18%, and 3%) respectively (Al-Abbas & Radhi, 2019; Al Jumaily, 2022; Hassan, 2015; Nouraddin & Alsakee, 2015).

Clinically, STDs are any communicable diseases that are transmitted from one person to another through oral, vaginal, or anal sex (Fasciana et al., 2022). There are about thirty germs (bacteria, viruses, and parasites) that can be transmitted through sexual contact. However, eight of these pathogens account for the vast majority of sexually transmitted infections in the world.

Four of these eight diseases are curable at present (syphilis, gonorrhea, chlamydia, and trichomoniasis) and responsible for infecting about 374 million individuals in 2020 (U.S. National Library of Medicine, 2022; World Health Organization, 2021). The remaining four are incurable and caused by viruses [hepatitis B, herpes simplex virus (HSV or herpes), human immunodeficiency virus (HIV), and human papillomavirus (HPV)] (U.S. National Library of Medicine, 2022).

The biopsychosocial burden of sexually transmitted diseases ranges from mild to severe (Drago et al., 2016). These diseases can cause many physical complications which may be rich to the killing of the victim, such as pelvic inflammatory diseases, cervical cancer, prematurity, low-birth weight, stillbirth, and neonatal death, as well as the predisposition of patients to other diseases, such as viral hepatitis and HIV (Garcia & Wray, 2022; National Academies of Sciences & Medicine, 2021). Further, these diseases have profound psychosocial problems such as anxiety, depression, social stigma, divorces, and the huge costs of treatments. In Islamic societies, the real dilemma of these diseases lies in the fact that most of them are asymptomatic and considered taboo conditions (Albanghali & Othman, 2020; Lee & Cody, 2020).

The good news here is that many sexually transmitted diseases can be prevented by adopting certain easy and inexpensive healthy sexual behaviors such as condom use and vaccination (Fontes et al., 2017; Gaydos et al., 2021; Umami et al., 2021; Workowski et al., 2021; Zenebe, 2022). Despite the great efforts that have been made to find an easy way to facilitate people's engagement in these protective behaviors, many people refrain from following it, and changing risky sexual behaviors is still a complex challenge (World Health Organization, 2021).

Generally, a lot of behavioral change models, such as the health belief model and precaution adoption model, pointed out that knowledge is an essential factor on which healthy behavior depends (Green & Murphy, 2014; Weinstein et al., 2020). It should be noted here that many previous studies showed a significant lack of women's knowledge about STDs worldwide. Furthermore, the lack of knowledge was not related to one category of women, as studies have shown an STD knowledge deficit among women of all ages and social classes, as well as pregnant and bisexual ladies (Baldeh & Isara, 2019; Ekşi & Kömürcü, 2014; Kowalczyk & Nowosielski, 2019; Parenti et al., 2023; Volck et al., 2013; Zizza et al., 2021). Concerning Muslim culture, one systematic review of several studies also showed the lack of STD knowledge among women. Iraq is not included in this review because of the absence of any estimated literature on such a topic (Alomair et al., 2020). However, the literature review study indicates that only one study regarding STD knowledge was conducted in Iraq during the past decade. This study revealed the fluctuation in Arabic women's knowledge about STDs in Southern Iraq (Naeem et al., 2020).

It is essential to find out whether Iraqi women of Turkman Muslim culture have sufficient information about how to deal with sexually transmitted diseases. It is also important to know the relationship between women's knowledge about these diseases and their sociodemographic characteristics. This knowledge will contribute to future plans for dealing with these embarrassing diseases among Muslim women. Therefore, this study aimed to assess women's knowledge of sexually transmitted disease and its association with their sociodemographic characteristics in Telafer City, Iraq.

2. Methods

2.1 Research design

This quantitative study employed a descriptive cross-sectional design to assess women's knowledge of sexually transmitted diseases and its association with sociodemographic factors.

2.2 Setting and samples

The study was carried out in Iraq, Nineveh governorate, Telfer City, from 1 December 2021 to 15 June 2022. The city of Telafer is located in Northwestern Iraq and has a population of about 300,000 people, the majority of whom are Muslim Turkmen (Knuppe, 2023). The target population for this study was women who are attending Primary Health Care (PHC) center in Telafer City. The sample size is calculated by using a sample size determination equation for a cross-sectional study with the following parameters [women knowledge estimated at 50% (because no previous study about STDs knowledge in Tealfer City; level of significance = 5%; z-score corresponding $Z\alpha = 1.95$; and desired precision (E) = 5%) (Wang & Cheng, 2020). These data of equations indicated that the minimum sample size required for conducting the study is

384 subjects. Since it is not easy to obtain the consent of Muslim women to talk about STDs, so, it was essential to adopt the non-probability convenient sampling method. Generally, this type of sample is considered to be at risk of bias (Gray et al., 2016). In order to avoid this risk, 500 women were invited to participate in the study. Invitation and recruitment of participants were carried out with the help of a gynecologist physician and nurses at the PHC center, who informed the women to go to the nurse's room to receive health care services and participate in the study by interviewing with the investigator. Inclusion criteria in this study included any women attending primary health care centers at an age more than 18 years old. Exclusion criteria included females with severe psychological illness. The final sample recruitment process resulted in the acceptance of 451 women to participate in the study.

2.3 Measurement and data collection

Data were collected using a sexually transmitted disease questionnaire that was completed through interview methods. Each interview takes about 10 minutes. The expectation of a low level of reading ability among some of the participants was the reason for choosing this method of data collection. The interviewing of samples was carried out by the investigator privately in a one-to-one manner in the nurse's room of the Primary Health Care Center. The questionnaire consists of two parts as follows: Part I: This part tries to measure the sociodemographic characteristics of the participant and includes questions about women's age, marital status, and educational level. Part II: This part was developed to measure the participants' knowledge about STDs. Specifically, in this part, the Sexually transmitted disease knowledge questionnaire (STD-KQ) was employed. This scale was developed by Jaworski and Carey (2007) and translated into the Arabic language by Albanghali and Othman (2020). The scale consists of 27 items measured in True(T), False(F), and Do not Know(DK) format. The score of items ranged from zero to one (zero for each wrong and do not know the answer and one for the right answer); the total score of the questionnaire ranged from (0-27) with a higher score indicating higher STD knowledge. The level of knowledge for participants was calculated by the following cut-off points [low; (0-8), moderate (9-17), high (18-27)]. These cut-off points are suggested based on the instrument's total score divided by the three levels of knowledge. The STD-KQ demonstrated good validity and reliability in several studies worldwide (Mansor et al., 2020; Pourmarzi et al., 2016; Teixeira et al., 2015; Weaver, 2015). However, to verify the validity and reliability of the scale for this study, the questionnaire was presented to ten experts in the field of medicine and nursing. According to the expert's opinion, one question was modified to accommodate the participants' characteristics. The changed item was question number 23 (A man can tell by the way his body feels if he has Hepatitis B); the question is changed to (A woman can tell by the way her body feels if she has Hepatitis B). The questionnaire's internal consistency was measured by Kuder-Richardson Formula 20 (KR-20) with (10) participants who were excluded from the study. The overall reliability of the scale was acceptable ($\alpha=0.8$). The validity of the questionnaire was estimated by the opinions of experts and previous studies' validity scores (Albanghali & Othman, 2020; Weaver, 2015).

2.4 Data analysis

Data were analyzed using Statistical Package for Social Science (SPSS) software for Windows version 25. Descriptive statistics of mean, standard deviation (SD), frequency (f), and percentage (%) are used to describe participants' characteristics and STD knowledge. On the other hand, the inferential statistics of one-way Analysis of Variance (ANOVA) and Fisher's exact test are used to measure the differences in knowledge mean score and the associations between participants' STD knowledge and sociodemographic characteristics. The p-value<.05 indicates a significant association.

2.5 Ethical considerations

Ethical approvals for conducting the study were obtained from the University of Telfer/ College of Nursing and the primary health care center in the approval letter with the number 413 dated 1 December 2021. A thorough adherence to ethical principles, including the 1964 Helsinki Declaration and later additions or adjustments, were applied in this study. Informed consent was obtained from all women engaged in the study. The consent form included an invitation for women to participate in the study by defining the study title, objectives, expected results, and desired outcomes. The women were informed that all data be confidential and not be used for purposes other than the study. Consent was obtained from the women through their signatures on the form. The study was conducted under the research program of the Nursing College at the University of Telafer.

3. Results

3.1 Sociodemographic characteristics of the participants

Table 1 indicates that the mean and SD of participants' age are (28.54±8.72) years old. Most of the participants (48.6%; n= 219) are in the age group of (18-25) followed by those in age (26-35) years old (30.4%; n=137). Concerning marital status, most of the participants are married (55%; n= 248), followed by those who are single (28.6%; n=129). Finally, regarding the level of education, it is obvious that only (6.9%; n=31) of women graduated from university and awarded Diploma and/or Bachelor's degree certificates.

Table 1. Sociodemographic characteristics of the study participants (n=451)

Characteristics	f	%
Age in years (Mean (SD) = 28.54 (8.72))		
18-25	219	48.6
26-35	137	30.4
36-45	81	18.0
46-55	14	3.1
Marital status		
Single	129	28.6
Married	248	55.0
Divorced	14	3.1
Widowed	60	13.3
Educational background		
Elementary school	153	33.9
Intermediate school	122	27.1
High school	145	32.2
University	31	6.9

3.2 Knowledge of sexually transmitted diseases among women in Telafer City

Table 2 shows the level of knowledge about sexually transmitted diseases among women in Telafer City. The table indicates that the overall STD knowledge Mean and SD is (6.67±5.85). Most of the women (73.8%; n=333) who participated in the study have a low level of knowledge. On the other hand, this table also reveals that the level of knowledge is moderate (14.4%; n=65) among the participants. Finally, only (11.8%; n=53) of women demonstrated a high level of STD knowledge.

Table 2. Knowledge of sexually transmitted disease among study participants (n=451)

Variable	Category	f	%
Knowledge	Low	333	73.8
	Moderate	64	14.4
	High	53	11.8
	Mean (SD)	6.67 (5.85)	

Notes: f = Frequency; % = Percentage; minimum knowledge score =0; maximum knowledge score =27; level of knowledge cut-off points: [low (0-8), moderate (9-17), high (18-27)].

3.3 Association between knowledge of STD and sociodemographic characteristics

A one-way ANOVA was conducted to compare the effect of age, marital status, and educational background on the sexually transmitted disease knowledge mean score. The analysis of variance showed that the effect of marital status, F (3,447) = 16.394, *p*=000 and the educational background F (3, 447) = 14.143, *p*=000 on STD knowledge score was significant. In addition, the results of Fisher's exact test (*p*<.001) indicate a significant association between sexually transmitted disease knowledge and each marital status and educational background (Table 3).

Table 3. Associations between participants' sociodemographic characteristics and knowledge of STD (n=451)

Items	Knowledge of STD									*P**
	M	SD	*P*	Low		Moderate		High		
				f	%	f	%	f	%	
Age										
18-25	6.38	5.68	.245	172	51.7	19	29.2	28	52.8	.436
26-35	7.24	6.39		95	28.5	21	32.3	21	39.6	
36-45	6.17	6.21		62	18.6	15	23.1	4	7.5	
46-55	8.85	5.44		4	1.2	10	15.4	0	00	
Marital Status										
Single	4.93	5.47	.000	189	56.8	37	56.9	22	41.5	.000
Married	7.46	7.68		116	34.8	9	13.8	4	7.5	
Divorced	10.85	5.06		4	1.2	10	15.4	0	0	
Widowed	10.80	7.91		24	7.2	9	13.8	27	50.9	
Educational Background										
Elementary school	6.27	6.97	.000	92	27.6	23	35.4	47	71.2	.000
Intermediate school	6.47	4.91		93	27.9	19	29.2	14	21.2	
High school	6.62	6.82		130	39.0	10	15.4	5	7.6	
Graduated	9.96	5.57		18	5.4	13	20.0	0	00	

STD: Sexual Transmitted Disease; f: Frequency; %: percentage; P*: results are based on Fisher's exact test; the p-value is significant at <0.05.

4. Discussion

Knowledge of sexually transmitted diseases is the cornerstone in preventing, controlling and ultimately reducing the incidence of these infections. For this reason, this study was conducted to assess women's knowledge about sexually transmitted diseases in Telafer City. The study indicated a low level of knowledge about sexually transmitted diseases among women as well as the presence of a significant association between women's STD knowledge and their educational background and marital status. Unfortunately, no previous studies conducted in Telafer City enable us to compare the results of the current study with it. However, the results of this study are consistent with a number of previous international studies that demonstrated a lack of knowledge about STDs, not only among developing countries but also in developed ones (Al-Gburi et al., 2023; Alomair et al., 2020; Baldeh & Isara, 2019; Subbarao & Akhilesh, 2017)

Married, younger and middle adulthood women without a university degree made up the majority of the study participants. This age period is considered the stage of sexual activity for women, which prompts them to visit maternity and gynecological services providers. This result is consistent with a number of studies that showed the willingness of women at this age period to obtain information about sexually transmitted diseases (Sakha et al., 2013; Shukla & Kaur, 2013). Whatever the case, the failure of the majority of Telafer City women to complete their university graduation needs further investigations to clarify the reasons behind this problem. In general, the lack of public and private universities in the City before 2014, the difficult security conditions that passed through the City in the past era, in addition to some societal traditions that restrict women from learning may be among these reasons.

The participants in the study showed a lack of knowledge about sexually transmitted diseases. Knowledge deficit was not limited to one disease, rather the women were unaware of many issues related to signs and symptoms of HIV, the risk of getting Hepatitis B through practicing anal sex, the mode of transmitting Genital Herpes, the role of Human Papillomavirus (HPV) in developing women cancer, and the available prevention methods of Chlamydia and Gonorrhea. This result is consistent with the results of studies conducted in Middle East countries (Farih et al., 2015; Naeem et al., 2020; Ortashi et al., 2013). However, it is inconsistent with studies conducted in Europe, which showed good awareness of HIV, but weak knowledge of other STDs (Drago et al., 2016). Therefore, this study agrees with the findings of a number of previous studies, which indicated the need to increase efforts in order to reduce the spread of sexually transmitted diseases (Albanghali & Othman, 2020; Al-Gburi et al., 2023; Alomair et al., 2020; Baldeh & Isara, 2019; Drago et al., 2016; Ekşi & Kömürcü, 2014; Farih et al., 2015; Zin et al., 2019).

Unmarried women showed a lower score of STD knowledge than those who were married, divorced, and/or widowed. This may be interpreted in terms of experience and exposure, as married women are the only Islamic female group legally allowed to practice sexual activity. This engagement in sexuality may expose married women to sexually transmitted infections (STIs) more than others and ultimately improves their familiarity with such diseases. This result also can be interpreted as the unmarried woman facing more obstacles in accessing sexual health information than others. Based on these findings, it is necessary to review how to deal with single Islamic girls and encourage them to receive adequate information about sexual health and practices before marriage. This result is consistent with a study by Alomair et al. (2020) which indicated the presence of differences in the score of STD knowledge according to marital status in a number of countries.

Regarding educational background, it was found that women with a university degree certificate were the most knowledgeable participants about sexually transmitted diseases. This result is consistent with a study by Alomair et al. (2020) which indicated that STD knowledge score is higher among educated women than illiterate ones. In general, this result suggests the role of educational attainment in developing women's health capabilities and raising awareness about sexually transmitted diseases.

Despite its application in other counties, sex education programs are not implemented in Iraq. However, previous studies have proven the efficiency of such programs in reducing the incidence of STDs and increasing adherence to preventive measures such as condom use and vaccination (Morales et al., 2018; Petrova & Garcia-Retamero, 2015). Therefore, it is necessary to conduct other studies to ascertain the incidence and prevalence of STDs in Iraq and the factors related to their occurrence. It is also essential to design an Islamic, culturally sensitive, women-tailored sex health education program and include it in the curricula of Iraqi secondary schools and universities.

Ultimately, the lack of STD knowledge reveals that women and their partners in Telafer City are at risk for contracting these infections and their complications and an increased risk of engaging in unhealthy sexual behaviors. This result necessitates further efforts from the public health authorities and nursing practitioners in Iraq, particularly in Telafer City, to determine the underlying reasons for the STDs knowledge deficit among women and focus more attention on these infections during conducting women nursing clinical practices.

5. Implications and limitations

This study is useful because it is considered a preliminary step for conducting other studies regarding women’s sexual health in Iraq. The result of the study could enable clinical women health care nurses to provide more interest to increase their client’s awareness about STDs. On the other hand, the result of the study also can stimulate the Telafer health care district and the female reproductive care providers to develop policies that aim to reduce the incidence of STDs in the city. Finally, the study recommends developing a health education program tailored to women’s characteristics in Telafer City.

The main limitation faced by the study is the refusal of nearly 50 women to participate in the study and the use of a convenient sampling technique. This limitation was bypassed by increasing the sample size to 451 instead of 384. Despite this limitation, the study provides useful results, and it is the first study that reveals the level of women’s knowledge regarding STDs in Tealfer City.

6. Conclusion

This study presents some scientifically and clinically important facts, as it showed that the level of knowledge about a group of the most dangerous communicable diseases (Sexual Transmitted Diseases) that seriously affects women’s health is low in Telafer City. Also, the study indicated that knowledge about STDs among women is influenced by their sociodemographic status. Therefore, the study recommends conducting other studies regarding sexually transmitted diseases in Telafer City.

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Author contribution

MQB: Conceptualization, methodology, formal analysis, writing.
AAA: Reviewing, Investigation, validation, and editing.

Conflict of interest

The authors declare no conflict of interest.

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ORIGINAL RESEARCH

Correlating Demographics and Well-being among Rural College Students in the Philippines

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Abstract

Background: College students' well-being is influenced by various factors such as age, gender, and socio-economic levels, but research findings on their correlation are inconsistent.
Purpose: This study aimed to investigate the relationship between age, gender, socio-economic levels, and well-being among college students in private and state colleges in Cebu and Bohol, Philippines.
Methods: The study employed a cross-sectional design and recruited 178 college students using convenient sampling. The modified Positive Emotion, Engagement, Relationship, Meaning, and Accomplishment (PERMA) profiler questionnaire was used to measure well-being. Data were analyzed using SPSS Statistics 27, and Kendall's tau and point-biserial correlation coefficient were used for data analysis.
Results: The overall PERMA score of the respondents (7.05±1.60) indicated high functioning. The analyses did not reveal a significant relationship between age and gender with well-being, but a significant association was found between socio-economic levels and the overall PERMA scores (p<0.05).
Conclusion: The study's findings suggest socio-economic levels significantly impact college students' well-being. Therefore, interventions and policies targeting socio-economic factors may effectively promote well-being among college students.

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1. Introduction

Well-being is a crucial indicator for individuals as it reflects their overall satisfaction with their lives and encompasses various factors such as their relationships, positive emotions, resilience, and realization of their potential (Centers for Disease Control and Prevention, 2018; Navarro-Carrillo et al., 2020). Policymakers need to monitor well-being as many living condition indicators do not capture individuals' subjective experiences of their lives. Additionally, global assessments of social determinants, such as age, gender, and socio-economic status, are also integral to understanding well-being (Billote et al., 2022; Villarino et al., 2023).

Research has shown that age and gender are associated with well-being, depending on the measure utilized (Biermann et al., 2022; Farwa et al., 2019). The distribution of well-being by age follows a U-shaped curve, with higher levels of well-being reported by younger and older adults than middle-aged adults (Farwa et al., 2019; Siedlecki et al., 2014; Xing & Huang, 2014). Gender differences in well-being vary with age and time, with men and women exhibiting similar levels of well-being in general (Navarro-Carrillo et al., 2020).

Socio-economic status is closely linked to well-being (Bernard et al., 2022; Montano, 2021), although research on the correlation between the two has produced mixed results (Chirwa, 2020; Navarro-Carrillo et al., 2020; Vera-Villarroel et al., 2015). While the connection between socio-economic status and well-being tends to be stronger for individuals with lower economic levels, research has also discovered effects for those with higher economic status (Centers for Disease Control and Prevention, 2018). Unemployment has been found to have a negative impact on both short- and long-term well-being, while paid employment is essential for an individual's well-being as it provides direct access to resources and fosters happiness, meaning, and purpose (Farwa et al., 2019).

Examining the correlation between age, gender, socio-economic status, and well-being is crucial for understanding health disparities, identifying risk factors, tailoring interventions, and advocating for policy changes (Ferreira, 2020; Javier et al., 2014; Montano, 2021; Villarino et al., 2021). By studying how different demographic factors impact the well-being, policymakers and healthcare professionals can better address the health needs of specific populations and work towards promoting healthier lifestyles and addressing structural inequalities (Piao et al., 2020).

While previous studies (Biermann et al., 2022; Matud et al., 2019; Nicola et al., 2020; Vera-Villarroel et al., 2015; Yang et al., 2021) have investigated the relationship between age, gender, and socio-economic status with psychological well-being and health-related factors in the general population, this study' focus is on college students, a unique and understudied population (Dalky & Gharaibeh, 2019; Hasan & Bao, 2020; Villarino, 2023). College students face unique stressors and challenges that may impact their well-being differently from the general population. Additionally, this study used the modified Positive Emotion, Engagement, Relationships, Meaning, and Accomplishments (PERMA) profiler questionnaire, which has not been widely used in previous studies. Therefore, this study's contribution is significant as it provides valuable insight into how age, gender, and socio-economic status impact the well-being of college students in rural areas of Cebu and Bohol, Philippines. Accordingly, this study aimed to investigate a correlation between age, gender, socio-economic levels, and well-being among rural college students in Cebu and Bohol, Philippines.

2. Methods

2.1 Research design

This study employed a cross-sectional research design to gather data on the socio-demographic profiles and well-being of respondents based on the PERMA construct. The study utilized a rating scale with 21 items to measure well-being, including positive emotion, engagement, relationships, meaning, and accomplishments.

2.2 Setting and samples

The study was conducted in May 2021 among college students enrolled in a state and private college in Cebu and Bohol, Philippines, for the second semester of the academic year 2020-2021. The study excluded fourth-year students on OJT (on-the-job training) and those with recognized mental health or behavioral issues. The study's sample size was determined using G*Power 3.1.9.7, setting to Cohen's medium effect size of 0.5, significance level of 0.05, and statistical power of 0.80 (Edmonds & Kennedy, 2017). Running this analysis, the achieved power is 0.83, which indicates that the sample size of 178 is sufficient to detect a medium effect size in a cross-sectional study. A convenient sampling method was used to recruit respondents, given the limitations caused by the pandemic. The study faced several challenges in selecting participant institutions due to the stringent health and governmental protocols implemented by the Inter-Agency Task Force (IATF). To address these issues, the affiliated institutions were chosen as the locale of the study, ensuring a secure and efficient way of gathering data in a Virtual Learning Environment (VLE).

2.3 Measurement and data collection

The study utilized the modified PERMA profiler questionnaire developed by Seligman and Ungar (2016) to measure the respondents' well-being. This instrument comprised of 21 items: 6 items each for positive emotion and engagement, and three items each for relationships, meaning, and accomplishments. The instrument underwent forward and backward translation for this study to ensure the questionnaire's reliability and validity among the target population. The study's reliability was assessed using Cronbach's alpha values ranging from 0.60 to 0.95 for the primary PERMA factors. The translated PERMA instrument test-retest reliability results indicate high levels of consistency for all five dimensions. The modified PERMA Profiler questionnaire demonstrates high concept validity, factorial and convergent validity, adequate reliability, and the first signs of measurement invariance of sex and nationality (Wammerl et al., 2019). The scoring procedure was anchored on PERMA (Table 1), and the midpoint of the 0-10 scale was around 6.5-7.5, based on validation studies (Butler & Kern, 2016; Seligman & Ungar, 2016).

Table 1. Scoring range for the PERMA questionnaire

Score range	Verbal description	Interpretation
9.00–10.00	Very high functioning (VHF)	Respondents' well-being is at a very high level.
8.00–8.99	High functioning (HF)	Respondents' well-being is at a high level.
6.50–7.99	Normal functioning (NF)	Respondents' well-being is normal.
5.00–6.49	Suboptimal functioning (SF)	Respondents' well-being is below the optimal (best possible) level.
0.00–4.99	Languishing (L)	Respondents' well-being is failing to make progress.

Demographic information, such as age, gender, and socio-economic status, was gathered from the participants in this study. To determine the socio-economic levels of the respondents, data from the 2018 Family and Income Expenditure Survey conducted by the Philippine Statistics Authority were utilized (Philippine Statistics Authority, 2018). The range of socio-economic levels of the participants is presented in Table 2.

Table 2. Range for the socio-economic levels of the respondents

Range	Income cluster	Per capita income	Monthly income (for a family of 5)
13-14	Rich	At least 20 times the poverty line	₱241,640 and above
11-12	High income	12 and 20 times the poverty line	₱144,984 and ₱241,640
9-10	Upper middle income	At least equal to 7 and 12 times the poverty line	₱84,574 and ₱144,984
7 – 8	Middle	4 and 7 times the poverty line	₱48,328 and ₱84,574
5-6	Lower middle income	2 and 4 times the poverty line	₱24,164 and ₱48,328
3-4	Low income	Between the poverty line	₱12,082 and ₱24,164
0-2	Poor	Less than the official poverty threshold	Less than ₱12,082

GoogleForm®(https://docs.google.com/forms/d/e/1FAIpQLSceCfHjw_m7KKx3IOti5l4c2VgHeukGX1knXBQ9g23YTiURRQ/viewform) was used to create the online instrument. After receiving the completed questionnaires, the lead researcher examined the responses for completeness and accuracy.

2.4 Data analysis

The study analyzed the socio-demographic profiles of the respondents, including age, gender, and socio-economic levels, and presented the data as frequencies and percentages. The well-being scores for positive emotion, engagement, relationships, meaning, and accomplishments were calculated using weighted means with standard deviations. Kendall's tau was used in terms of the PERMA construct to measure the relationship between age and socio-economic levels with well-being scores. The point-biserial correlation coefficient was utilized to determine the association between gender and well-being. The significance level for all relationship tests was set at $\alpha=0.05$. All statistical analyses were performed using SPSS Statistics 27.

2.5 Ethical considerations

The study was granted ethical approval by the College Research Ethics Committee (UREC) of the Cebu Technological College with a reference number: 001-2021. The research procedures, informed consent forms, and data collection instruments complied with ethical standards. Before participating in the study, the respondents were informed about the study's flow and duration and provided signed informed consent forms. After the research, the respondents received a certificate of participation.

3. Results

3.1 *Socio-demographic profile of the respondents*

As shown in Table 3, most of the respondents were 20-21 years old. The majority were females (76.40%) and belonged to the 5-6 socio-economic level (43.82%), indicating that they belonged to the lower middle-income group.

Table 3. Socio-demographic profile of the respondents (n=178)

Profile	Frequency	Percentage (%)
Age		
23 and above	16	8.99
20-21 years old	124	69.66
18 and below	38	21.35
Gender		
Female	136	76.40
Male	42	23.60
Socio-economic Levels		
13-14	0	0.00
11-12	0	0.00
9 – 10	10	5.62
7 – 8	50	28.09
5 – 6	78	43.82
3 – 4	21	11.80
1 – 2	19	10.67

3.2 *PERMA scores of the respondents*

The results of the PERMA mean scores of the respondents indicate that positive emotion (7.25±1.85), engagement (6.92±1.42), relationships (7.12±1.71), meaning (7.41±1.84), accomplishments (7.20±1.60), and overall PERMA (7.05±1.60) got an overall description of high functioning (Table 4).

Table 4. The respondents' PERMA scores

Variables	Mean	Standard Deviation	Description
Positive Emotion	7.25	1.85	High Functioning
Engagement	6.92	1.42	High Functioning
Relationships	7.12	1.71	High Functioning
Meaning	7.41	1.84	High Functioning
Accomplishments	7.20	1.60	High Functioning
Overall PERMA	7.05	1.41	High Functioning

Notes: N=178; Description: 9.00–10.00 = Very High Functioning; 8.00–8.99 = High Functioning; 6.50–7.99 = Normal Functioning; 5.00–6.49 = Suboptimal functioning; 0.00–4.99 = Languishing

3.3 *The relationship between age, gender, socio-economic levels and well-being*

As shown in Table 5, Kendall's tau results indicate a weak negative correlation between age and PERMA. However, this correlation was statistically insignificant, as the computed p-values were greater than the significance level of 0.05. Similarly, the point-biserial correlation coefficient between sex and PERMA was also weak and negative, with a computed p-value of 0.32, suggesting that the observed correlation coefficient was statistically insignificant.

On the other hand, the analysis showed a statistically significant positive association between socio-economic levels and PERMA. The computed Kendall's tau had a p-value of ($p<0.05$), indicating a significant correlation between the two variables. These findings suggest that individuals with higher socio-economic levels are more likely to have higher levels of well-being, as measured by the PERMA construct.

Table 5. Relationship between age, gender, and socio-economic levels with overall PERMA

Variables	Frequency	PERMA	*p*-value
Age		-0.18	0.75*
23 and above	16		
20-21 years old	124		
18 and below	38		
Gender		-0.07	0.32**
Female	136		
Male	42		
Socio-economic Levels		0.2	0.00*
13-14	0		
11-12	0		
9 – 10	10		
7 – 8	50		
5 – 6	78		
3 – 4	21		
1 – 2	19		

Notes:* Kendall's tau, ** Point-biserial correlation coefficient

4. Discussion

This study investigated the associations between age, gender, and socio-economic levels with well-being among college students, specifically in terms of the PERMA construct. The results showed that age and gender indicate no significant association with well-being. On the contrary, the socio-economic levels of the respondents indicate a significant correlation with well-being.

Since the results indicate an insignificant association between age and well-being, it agrees with some findings in the literature. Previous studies by Diener et al. (2018) and Realo et al. (2017) found that age was not significantly related to subjective well-being (SWB) and overall life satisfaction among a sample of adults aged 18-94 years. However, other studies have found mixed results regarding the relationship between age and well-being. According to these studies (Baker & Alshehri, 2020; Biermann et al., 2022; Wigert et al., 2021), older adults report higher levels of subjective well-being than younger adults. On the other hand, Dodge et al. (2012) found no significant differences or even lower levels of subjective well-being among older adults. Although some findings in the literature do not support a correlation between age and well-being, Handayani et al. (2022) and Olatubi et al. (2022) suggest that there is a positive relationship between age and well-being, particularly regarding aspects such as emotional regulation, social connectedness, and life satisfaction.

Furthermore, the findings also reveal no correlation between gender and well-being. Studies by Diener et al. (2018) and Sinaga et al. (2022) found no significant differences in subjective well-being (SWB) between men and women across various age groups. However, other studies have found that men and women may differ in certain aspects of well-being. A study by Graham and Chattopadhyay (2013) have found that women report higher levels of emotional distress, such as anxiety and depression, than men. Furthermore, Matud et al. (2019) also reports that men have higher life satisfaction and self-esteem levels than women. While some literature does not support a correlation between gender and well-being, it is essential to note that there may be differences in specific aspects of well-being between men and women. Additionally, factors such as cultural and social norms, gender roles, and life experiences may influence the relationship between gender and well-being.

Most of the respondents in this study belonged to the lower middle-income group, which is associated with lower levels of well-being compared to higher socio-economic levels (American Psychological Association, 2017; Delshad et al., 2022; McLaughlin & Sheridan, 2016). Other studies also found that job security, job satisfaction, and material resources such as food and housing were positively associated with well-being (Nicola et al., 2020; Villarino et al., 2021). However, the relationship between socio-economic levels and well-being is complex and can be influenced by individual, social, and cultural factors (Chirwa, 2020; Cundiff & Matthews, 2017; Navarro-Carrillo et al., 2020).

Moreover, the respondents' PERMA results indicate an interpretation of high functioning. This means that the respondents' well-being is at a high level. Based on recent literature, findings on PERMA have been consistent with previous research (Umucu et al., 2020; Villarino, 2023; R. T. H. Villarino et al., 2022), indicating that the five dimensions of well-being (positive emotion, engagement, relationships, meaning, and accomplishment) are essential components of overall well-being. Some studies (Pezirkianidis et al., 2019; R. T. Villarino et al., 2022) have shown that these dimensions may be differentially related to mental health outcomes, with Positive Emotion and Engagement being particularly important for reducing symptoms of depression and anxiety. Additionally, recent studies have focused on the role of specific factors that can influence PERMA dimensions. For example, social support (Wammerl et al., 2019) is a crucial predictor of relationship and meaning dimensions, while mastery experiences are essential for the accomplishment dimension (Ascenso et al., 2018). In this connection, recent literature has continued to support the importance of the PERMA framework for understanding well-being while also providing insights into the specific factors that can influence each dimension.

Research has consistently shown that age, gender, and socio-economic levels are associated with well-being, although the exact nature of these associations may vary depending on the specific aspects of well-being being examined. While some studies have found no significant relationship between age or gender and well-being, the majority of research suggests that older adults and women may experience higher levels of well-being in certain aspects, such as emotional regulation and social connectedness. Additionally, individuals with higher socio-economic levels tend to report higher well-being levels than those with lower socio-economic levels. However, the relationship between socio-economic levels and well-being is complex and may be influenced by various individual, social, and cultural factors.

5. Implications and limitations

Understanding how age, sex, and socio-economic status are associated with well-being is critical for supporting college students' health and well-being. Professors and support staff who work with college students should be aware of how these factors can impact well-being and provide care that takes them into account. This may involve working with older or female students to identify and address sources of emotional distress or social isolation, such as academic stress or relationship difficulties. It may also involve working with students from lower socio-economic backgrounds to manage access to educational resources, financial aid, and other factors that may impact their overall well-being. By incorporating a nuanced understanding of these relationships into their work, those who support college students can help promote positive health outcomes and improve their quality of life.

However, this study has some limitations. The design only allows for correlational inferences regarding the association between age, sex, socio-economic status, and well-being. No differential assumptions can be made. Additionally, the study only included respondents from two Higher Education Institutions located in rural municipalities in Cebu and Bohol, Philippines, which may limit the generalizability of the findings to other colleges and universities.

6. Conclusion

This study shows that socio-economic levels are strongly associated with college students' well-being across multiple domains, including positive emotion, engagement, relationships, meaning, and accomplishments. The findings suggest that interventions and policies targeting these specific factors may be particularly effective in promoting well-being among college students. Understanding the complex relationship between age, gender, socio-economic level, and well-being can help improve the quality of life and promoting positive health outcomes for students.

To improve future research in this area, larger sample sizes, differential inferences, and longer study durations could be implemented. These changes would allow for more comprehensive data collection and analysis, increase the generalizability of the results, and provide opportunities to evaluate changes over time.

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Author contribution

This study represents the authors' original work. RTV, MLV, and MCT developed the theory, conceived the presented idea, and conducted the computations. PB and MP verified the analytical methods used.

Conflict of interest

The authors declare no conflicts of interest related to this research.

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REVIEW

Resilience-related Breast Cancer: A Concept Analysis

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Abstract

Background: Breast cancer-related adversity can result in severe psychological issues. However, some patients were able to demonstrate resilience, while others were not. Therefore, the concept of resilience in breast cancer patients requires further clarification.
Purpose: This study aimed to systematically analyze resilience in patients with breast cancer, its attributes, antecedents, consequences, and empirical referents.
Methods: This concept analysis used the Walker and Avant method. CINAHL, Embase, Scopus, Web of Science, PubMed, Cochrane, and Medline-OVID databases were explored using the keywords 'resilience*' and 'breast cancer'. Papers discussing resilience among breast cancer patients were used as criteria for inclusion. The analysis focused on the redefinition of resilience-related breast cancer by identifying attributes, antecedents, and consequences.
Results: A total of 53 studies were analyzed to construct resilience among breast cancer patients. The analysis identified that resilience in breast cancer patients has three defining attributes: coping, optimism, and social support. The antecedents were body image after mastectomy, symptom distress, cancer-related stigma, and fear of cancer recurrence, while the consequences included recorded as the quality of life and post-traumatic growth.
Conclusion: Critical characteristics of resilience in breast cancer patients were coping, optimism, and social support. Thus, improving those characteristics might improve the quality of life and post-traumatic growth.

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1. Introduction

Breast cancer is the most frequent malignancy among women and the second most significant cause of cancer-related death. A breast cancer diagnosis potentially leads to a traumatic event, with both physical and psychological consequences, that occurs in late response after the end of medical treatment (Martino et al., 2019). The fifth edition of the diagnostic and statistical manual of mental disorders (APA, 2013) classifies a cancer diagnosis as a sort of trauma that brings a slew of issues (Romeo et al., 2019). Because of the difficulty in recognizing a unique stressful event, breast cancer has a distinct and special nature of the disease. The risk of life crisis and bodily integrity are frequently high, and the agony, damage, and loss of social and occupational roles could cause overwhelming emotion in a significant minority of patients. Lack of control, impairment, and the diagnosis' swiftness will cause acute fear, hopelessness, terror, anxiety, and melancholy (Quattropani et al., 2016).

Some people who have been traumatized may have serious issues, whereas others (who may have been subjected to the same traumatic event) may only have little or no trouble recovering. This condition is known as resilience. In general, "resilience" refers to regaining normal function following hardship, sustaining the regular part of life, or successfully adapting to stressful experiences in life (Johnston et al., 2015). The ability to successfully adjust to adversity, difficult life experiences, major threat, or trauma is characterized widely as resilience. Recent research indicates that resilience is an "active process" rather than simply reversing pathological mechanisms (Feder et al., 2019). The ability to adapt to life circumstances positively is referred to as resilience. The process of dynamism involves a form of adaptable functioning that enables individuals to confront obstacles by restoring an initial equilibrium or rebounding as a chance for development (Sisto et al., 2019).

Resilience is crucial for cancer patients as it can shield them from the harmful effects of stress. It helps in managing or adversity of a cancer diagnosis, coping with adverse events and making necessary life adjustments. This, in turn, improves mental health and treatment outcomes (Seiler & Jenewein, 2019). Resilience is an important factor for cancer patients as they navigate the challenges of their diagnosis and treatment, such as chemotherapy, radiotherapy, or even surgery. Resilience can help patients maintain a positive outlook and cope with their illness' emotional and physical stress. Previous research has indicated that the concept of resilience in cancer patients is tentative due to the fact that conceptualizations of resilience may change over time as the researcher's comprehension of the concept improves or changes (Luo et al., 2020). However, no study clearly defines resilience in breast cancer patients. Considering the benefits of concept analysis and the need to redefine resilience among breast cancer patients, thus it is essential to conduct a study to explore the attributes, antecedents, and consequences. This study aimed to systematically analyze resilience in patients with breast cancer, its attributes, antecedents, and consequences.

2. Methods

This concept analysis is incorporated with a literature review of available evidence. Databases from CINAHL, Embase, Scopus, Web of Science, PubMed, Cochrane, and Medline-OVID were explored to gain the articles that discussed resilience. Databases were searched until 1 February 2022. Quantitative studies fulfilling the following inclusion criteria were included: (1) studied resilience in the breast cancer patient, and (2) resilience was measured by validated instruments. Studies were excluded if the full text were not accessible. The search used 'resilience*' and 'breast cancer' as the keywords. Studies from databases were carefully screened by EndNote version 20. Duplicates of articles were removed electronically and manually. Two independent reviewers examined the title and abstract to ensure their eligibility criteria as included studies. Following the systematic review guideline recommendation, the PRISMA flowchart was used to get the final included articles.

The Walker and Avant approach was used to carry out the following concept analysis on resilience in a breast cancer patient. It is a common strategy to do concept analysis due to the simplicity and convenient usage to reach the aim of redefinition. Walker and Avant's concept analysis consists of eight steps, including selecting a concept, determining the purpose of analysis, identifying all uses of the concept, defining attributes, identifying a model case, identifying borderline, related, and contrary cases, identifying antecedents and consequences and defining empirical referents (Walker & Avant, 2018). This approach was used as an analysis guide to construct resilience among breast cancer patients.

3. Results

A comprehensive literature search in seven electronic databases was performed, with 890 studies retrieved. After the screening and eligibility step, 53 papers were included to construct the concept analysis (Figure 1). From those included studies, keywords were identified and clustered into antecedents, attributes, and consequences (Table 1, Figure 2). Further analysis was conducted using the Walker and Avant approach (Walker & Avant, 2018).

3.1 The uses of the concept

The word resilience derives from the participle of the Latin verb resilire, meaning "to jump back" or "to recoil". Resilience can be defined as the ability to effectively adapt to challenging life experiences, which involves the capacity to exhibit mental, emotional, and behavioral flexibility in response to both internal and external demands (VandenBos, 2007).

Resilience refers to the capacity to adjust the changes in life circumstances. It involves a dynamic process and requires a particular sort of adaptive functioning to deal with the obstacles in life by regaining initial equilibrium or bouncing back to growth (Sisto et al., 2019). Resilience is intrinsically linked to mental health as a protective factor against psychological distress. All aspects, such as biological (e.g., gene-environment interaction), personal (e.g., feeling of coherence, optimism, hope), and social (e.g., social support, acceptance) aspects, contribute to the resilience of cancer patients. Thus, it is primarily favorable to psychological and treatment-related outcomes (Seiler & Jenewein, 2019). Psychological resilience enables people to overcome challenges by preserving and increasing their resources to the point where personal strength and a positive restructuring of their biographical history are achieved. As a result, adopting resilient attitudes allows one to construct and reconstruct one's life path, re-establish a new balance by bringing about change in oneself, and responding constructively to challenges, turning them into chances for progress (Sisto et al., 2019; Yi et al., 2020).

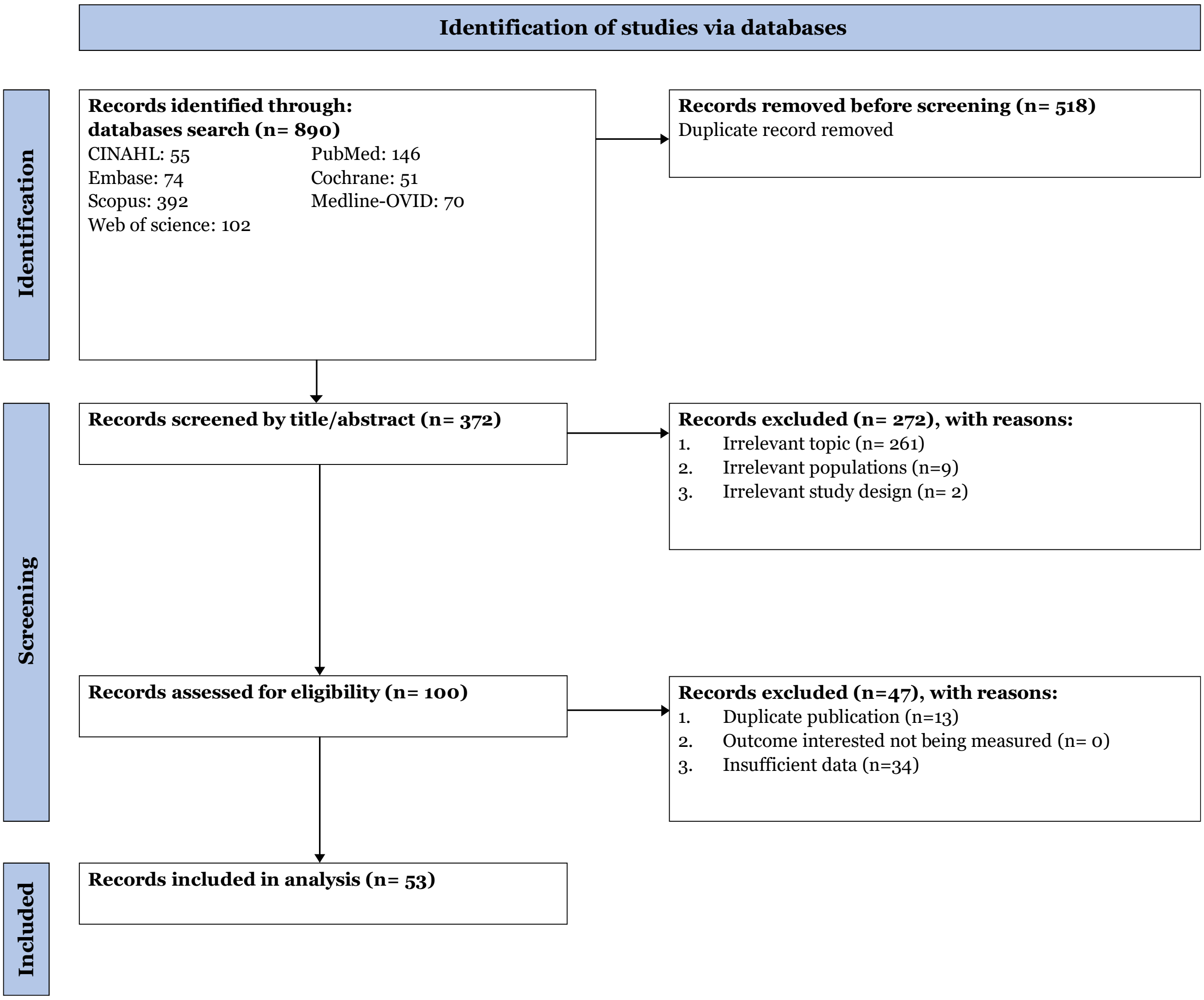

Figure 1. PRISMA flowchart

3.2 Defining attributes

Identification of the defining attributes of a concept is the heart of concept analysis. Protective factors refer to distinct characteristics or circumstances that are essential for the manifestation of resilience. Several attributes of the concept of resilience in breast cancer patients were identified, including; 1) satisfaction with social support, 2) ability to cope with the disease and cancer treatment, and 3) optimism (see Table 1, Figure 2).

The first antecedent is the ability to cope with the disease and treatment. The term coping refers to the ongoing cognitive and behavioral strategies employed by individuals to manage internal or external stressors that may be overwhelming or beyond their capacity to handle (Lazarus & Folkman, 1984). The diagnosis and treatment of cancer can elicit significant and enduring distress. The empirical data suggests that the patients' level of engagement with the treatment was correlated with their capacity to manage the stress and burden associated with their illness and treatment. The association between positive thinking and improved mental and physical health is linked to the employment of adaptive coping strategies (Carver et al., 2005). Emotional intelligence and resilience are essential for people to deal with difficult situations, including patients with breast cancer. This ability to cope with the crisis is modifiable through support and training. Patients who could enhance resilience and have better emotional intelligence are associated with better clinical outcomes (Edward & Warelow, 2005).

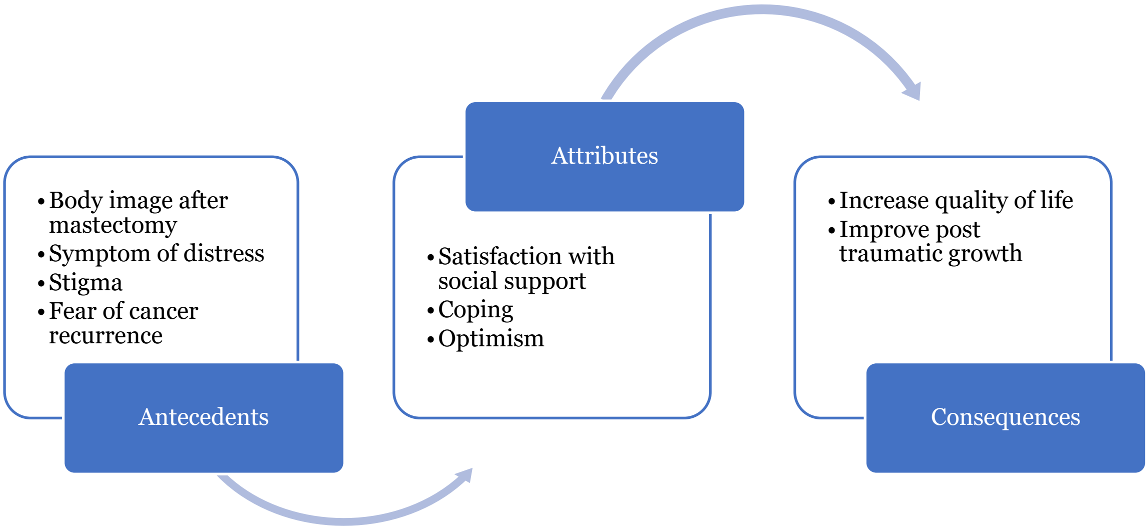

Figure 2. Attributes, antecedents, and consequences of resilience among breast cancer patients

The second attribute is satisfaction with social support. The concept of social support pertains to an individual's subjective evaluation of their level of contentment with social interactions. There is a prevalent belief that it plays a crucial role in mitigating both psychological and physical stress responses (Cohen & Wills, 1985). The moderating influence of social support on genetic and environmental vulnerabilities for mental illness may be attributed to its impact on various psychosocial factors, including the promotion of effective coping strategies and the modulation of multiple neurobiological factors. The provision of social support appears to play a significant role in endowing individuals with the ability to withstand and recover from the negative effects of stress (Pérez et al., 2016). Stress can occur in patients with breast cancer from diagnosis to recovery, necessitating social support from the surrounding environment. Social support is critical for developing resilience and an increase in the quality of life of breast cancer patients. Health practitioners should establish appropriate recommendations to assist patients in obtaining adequate assistance and building resilience to improve their quality of life following breast cancer (Zhang et al., 2017).

The level of contentment with social support indicates that such contentment may serve as a mediator or moderator in relation to health outcomes. Furthermore, the contentment pertaining to the origins and varieties of aid, the ability to recover from adversity, and a hopeful outlook demonstrate a favorable standard of living (Simancas Fernandez et al., 2021). A study by Razurel and Kaiser (2015) found that satisfaction with social support, primarily from the spouse, will reduce psychological disorders, depressive symptoms, and anxiety and increase self-efficacy.

The third attribute is optimism. Optimism refers to a widespread expectation of favorable outcomes (Scheier & Carver, 1985). Breast cancer patients who had a higher level of optimism reported more significant social and mental health issues (Colby & Shifren, 2013). Optimism can be characterized as a set of protective factors that facilitate emotional well-being, mitigate anxiety, promote adaptive health behaviors, and yield improved physical health results (Gallagher et al., 2019). Breast cancer patients who encounter substantial stressors and negative or cognitive processes are at an increased risk of developing anxiety and other emotional disorders. At this point, optimism promotes resilience and healthy coping (Gallagher et al., 2019).

3.3 Model Case

A model case demonstrates all its defining attributes and thus helps better articulate the concept's meaning (Walker & Avant, 2018). The following are examples of model cases. In this model, patients experience all attributes.

> *Angela, 44 years old, has been diagnosed with breast cancer stage 3 in the last two years. She is a gorgeous, successful businesswoman who has a wonderful family with her husband and two children before her illness. Angela has already been unable to work following her cancer treatment due to the side effects of chemotherapy and the tremendous pain she endured. She always tries to cope with her illness and treatment by following yoga and some traditional herbs to reduce the pain. Angela also attends a breast cancer awareness program led by nurses in the hospital where she is receiving treatment. She expressed her satisfaction with the care and support from her husband last two days. She has a high optimism that the disease is curable. After completing the chemotherapy session, the doctor declared her cancer-free survivorship.*

Based on the above case, Angela demonstrates all attributes, satisfaction with social support (breast cancer support group), coping (reducing her pain with medication and yoga), and optimism (believing that her disease is treatable).

3.4 Borderline, related, and contrary cases

3.4.1 Borderline case

A borderline case exhibits a majority of the defining characteristics of a given concept, albeit not all of the attributes that are encompassed within the concept.

> *Clara, 37 years old, was diagnosed with breast cancer stage 2. Clara is known as a tough person in the face of life's problems. Despite the illness she experienced, she still looked cheerful and excited, undergoing a series of cancer therapies. She told the nurse in charge that she could be a survivorship woman for her disease, and she was optimistic that her condition would be better. Although she has not received much support from her husband, she believes to has positive outcomes from treatment.*

In this case, Clara only experienced one attribute, namely optimism (believing that her condition would be better).

3.4.2 Related case

A comparable scenario exemplifies instances of apprehension that indicate the concept under investigation yet lacks all of its defining attributes. The concept in question exhibits resemblances to the primary point of interest as observed in analogous scenarios; however, it is important to note that the two concepts are separate and distinct.

> *Brunette, 34 years old, has come to the hospital for a medical check-up, and she recently received a breast cancer diagnosis. She is severely impacted by having breast cancer and the chemotherapy effects at such a young age, and she wishes to give up. However, she tries to undertake the treatment. Brunette is satisfied with the hospital's services because her illness can be diagnosed early. The hospital also has complete treatment facilities so that her disease is not too late for treatment.*

In this case, Brunette's complaint relates to the concept or attribute, but the causes are different. She is satisfied with the hospital's services, not because of social support related to her disease.

3.4.3 Contrary case

In a contrary case, none of the attributes of the concept is present.

> *A famous photo model, Dorothy, 30 years old, was diagnosed with breast cancer stage III B. When she came to the clinic, her doctor said that she required a total mastectomy before getting worse. She was very frustrated and depressed since she could not continue her carrier due to her cancer. She felt hopeless and thought that her body could not be normal even if the cancer was taken out. Thus, she felt sad and unsatisfied with the doctor's*

> *treatment plan. Because she is an orphan, she lives alone and has no more support from her significant, resulting in her blue feeling and inability to deal with his illness.*

In this case, Dorothy shows the opposite symptom of the attribute. She experienced psychological distress, an inability to cope, and was unable to be resilient to her illness.

3.5 Antecedents and consequences

3.5.1 Antecedents

Antecedents are factors, events, or situations before or preceding the concept (Walker & Avant, 2018). The occurrences of traumatic or negative events were identified to be necessary for developing resilience throughout the literature. The events will threaten an individual's ability to cope with the disease and impact the personal response to the life crisis (Garcia-Dia et al., 2013). The available literature indicated that the antecedent of resilience in breast cancer (Figure 2) are body image issues after mastectomy, symptoms of distress, cancer-related stigma, and fear of cancer recurrence (Izydorczyk et al., 2018; Koral & Cirak, 2021; Lee & Kim, 2018; Ocel, 2017).

The surgical intervention utilized in the management of breast cancer has the potential to adversely impact a woman's perception of her physical appearance and self-concept (Koçan & Gürsoy, 2016). We can see this body image issue as a trauma for breast cancer that will trigger resilience in breast cancer patients. Aside from body image disturbance, they will develop symptom distress. The experience of symptom distress has the potential to lead to physical dysfunction and emotional disturbances. This is especially true for upper-arm problems, sleep disturbance, fatigue, and body image disturbance, which may manifest as long-term side effects over time (Boehmke, 2004). Patients with higher distress will have a lower resilience level (Matzka et al., 2016).

Cancer patients are often subjected to social stigma in numerous nations. Stigmatization is linked to diverse clinical outcomes and social ramifications (Fujisawa & Hagiwara, 2015). People who are stigmatized frequently face prejudice and social exclusion. As was previously said, it is not unexpected that cancer stigma deters many people from getting medical care (Matthews et al., 2002). Resilience will moderate stigmatization in breast cancer patients through a higher level of psychological well-being (Ocel, 2017).

The phenomenon of fear of cancer recurrence is characterized by an individual's apprehension, anxiety, or unease regarding the potential for cancer to reoccur or advance. This ailment is frequently encountered by individuals who have undergone therapy for cancer (Ozakinci et al., 2014). Patients with a lower fear of recurrence will have a higher resilience score. Increased resilience can potentially decrease the level of anxiety associated with the possibility of a future occurrence. Individuals possessing a high degree of resilience are anticipated to exhibit a greater capacity for managing stressors encountered throughout their lifespan (Koral & Cirak, 2021).

3.5.2 Consequences

Consequences are the end-points that occur due to the critical components of the concept (Windle, 2011). Consequences aim to recognize or measure the essential characteristics or attributes of the resilience concept. The end-points of resilience in breast cancer patients (see Figure 2) are quality of life and post-traumatic growth (Celik et al., 2021; Edward et al., 2019; Li et al., 2020). Quality of life refers to personal perception of their current expectation regarding their life with breast cancer. Breast cancer is associated with reducing health-related QoL (Lidgren et al., 2007). The experience of a life crisis that arises during the diagnosis and/or treatment of breast cancer has the potential to foster personal resilience, ultimately impacting the individual's quality of life. Patients who exhibit greater resilience tend to experience a notably higher quality of life across a wide range of quality of life domains (Ristevska-Dimitrovska et al., 2015).

Post-traumatic growth (PTG) refers to the positive psychological transformation that individuals undergo as a result of coping with highly challenging life circumstances. PTG emerges in a relatively short period of time following a diagnosis of breast cancer and is linked to the level of illness intrusiveness at the outset, as well as to subsequent increases in social support, spirituality, active-adaptive coping strategies, and mental health (Danhauer et al., 2013). PTG can present itself in diverse forms, such as an augmented sense of gratitude towards life, deeper and more significant connections with others, enhanced personal resilience, altered priorities, and a more profound existential or spiritual perspective on the existence (Pat-Horenczyk et al., 2015). Insufficient levels of resilience have a direct and indirect impact on post-traumatic growth, as well as the utilization of maladaptive coping mechanisms, and may result in avoidance behaviors that hinder comprehensive processing of the traumatic event (Gori et al., 2021). The presence of PTG has been found to be correlated with decreased levels of psychological distress and increased resilience. Enhancing resilience among breast cancer patients is crucial, as it is widely acknowledged that resilience plays a pivotal role in determining an individual's quality of life and post-traumatic growth (Pat-Horenczyk et al., 2015).

3.6 Empirical Referents

Empirical referents pertain to factual data that can be subjected to testing, replication, and validation (Walker & Avant, 2011). Several studies have utilized the available instrument to identify resilience among breast cancer patients. The most common tools are the Connor–Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003) followed by the Resilience Scale (RS) (Wagnild & Young, 1993), and the Resilience Scale for Adults (RSA) (Friborg et al., 2003). Besides those standard tools, two instruments precisely measure the cancer patient's resilience: The Breast Cancer Survivor Resilience Scale and the Resilience Scale Specific to Cancer (RS-SC).

The CD-RISC consists of 25 items with the 5-point Likert scale from not all true (0) to true nearly all the time (4). The tool encompasses five distinct domains, namely personal competence, high standards and tenacity, trust in one's instincts, tolerance of negative affect and strengthening effects of stress, positive acceptance of change and secure relationships, control, and spiritual influences. A positive correlation exists between higher scores and increased resilience among the patient population (Connor & Davidson, 2003).

The Resilience Scale exists with 25 items, divided into five essential characteristics: meaningful (or purpose) life, perseverance, self-reliance, equanimity, and existential aloneness. The responses are available on a 7-point scale from 1, disagree, to 7, agree. Possible scores range from 25 to 175, reflecting higher resilience scores (Wagnild & Young, 1993). The third tool, the Resilience Scale for Adults, consists of six protective dimensions of resilience in adult patients. The aforementioned constructs include self-perception, future planning, social competence, familial cohesion, social resources, and a structured approach. The Resilience Scale for Adults (RSA) comprises 33 items, with response options ranging from 1 to 7. The scores obtained from the RSA are indicative of the degree of protective factors associated with resilience, with higher scores indicating greater levels of resilience (Friborg et al., 2003). Most of the included studies used the CD-RISC as the measurement tool to identify resilience among breast cancer patients. It makes sense since the critical characteristics of resilience in breast cancer patients are covered by this tool, making it more suitable and applicable to identifying resilience in breast cancer. The ability to cope with cancer is related to personal competence; satisfaction with social support includes a secure relationship, and optimism has tenacity.

The Breast Cancer Survivor's Resilience Scale (BCRS) was originated in Japan. The instrument in question was specifically designed for the purpose of assessing the resilience levels of individuals who have survived breast cancer. The BCRS scale is deemed to possess a considerable degree of validity and reliability due to its incorporation of both individual and social factors. Healthcare professionals may contemplate implementing resilience interventions for breast cancer survivors based on personal and social perspectives, as indicated by the scale (Kim et al., 2020).

The Resilience Scale Specific to Cancer Instrument (RS-SC) comprises five domains, namely generic element, benefit finding, support and coping, hope for the future, and meaning for existence. The scale is designed to measure resilience levels, with higher scores indicating greater resilience. There exist two distinct variations of RS-SC, namely the 25-item and 10-item versions. The psychometric properties of RS-SC-25 are favorable, indicating its potential utility in determining an asymptomatic threshold for informing the implementation of psychosocial or pharmacological intervention. A brief 10-item version (RS-SC-10) has been created utilizing multidimensional item response theory (MIRT) to enhance item discrimination and alleviate the scale burden on patients. This abbreviated version has been employed for patients receiving care in outpatient wards (Ye et al., 2020).

4. Discussion

The objective of this analysis was to conduct a comprehensive examination of resilience in individuals diagnosed with breast cancer, including an assessment of its defining characteristics, precursors, outcomes, and empirical evidence. The resilience of breast cancer patients is noteworthy, given the potentially traumatic nature of the diagnosis and treatment of breast cancer, which can result in both physical and psychological challenges (Martino et al., 2019). Although a cancer diagnosis and treatment can cause considerable distress, a considerable number of cancer patients exhibit remarkable resilience. Regrettably, not all breast cancer patients exhibit a favorable response to adversity, and certain individuals experience a decline in their condition in response to the life crisis associated with breast cancer (Seiler & Jenewein, 2019). Thus, this paper delivered the redefining of resilience among breast cancer patients.

This study identified four antecedents in breast cancer resilience: body image issues after mastectomy, symptoms of distress, cancer-related stigma, and fear of cancer recurrence. Mastectomy is a surgical procedure aimed at the complete removal of breast tissue in order to address or prevent the onset of breast cancer. The mastectomy procedure is commonly regarded as a distressing occurrence that induces psychological strain and, in certain instances, psychological complications (such as anxiety and depressive symptoms, low self-regard, body image concerns, and others). The body image includes the symbolic meaning and importance of her breasts. Changes in body image after mastectomy will affect positive or negative adaptation or resilience (Izydorczyk et al., 2018). Some studies reported mastectomy hurts body image (Ruiz-Rodríguez et al., 2022; Türk & Yılmaz, 2018). This is because mastectomy will change the appearance and women's perception that the cancer experience threatens their womanhood and make them feel less like a woman (Türk & Yılmaz, 2018). On the contrary, an alternative investigation demonstrated that certain women experienced heightened strength and self-assurance subsequent to undergoing surgery. These women refused to conform to conventional beauty standards and expressed a sense of pride in the scars resulting from their mastectomy (Grogan & Mechan, 2016).

Symptoms of distress can affect the resilience of breast cancer patients. The prevalent symptoms encountered by patients undergoing chemotherapy are pain, nausea, and vomiting. (Booth et al., 2007; Maida et al., 2009). The pain was a significant problem for many women with breast cancer, and this was generally poorly managed. Physical pain caused by cancer wounds is a complex phenomenon and seriously impacts patients' quality of life (Maida et al., 2009). The pain may be attributed to various factors such as the expanding neoplasm, compression of adjacent anatomical structures, edema arising from compromised lymphatic and capillary drainage, wound infection, contact with cutaneous nerve endings, or manipulation during dressing alterations (Probst et al., 2012). Wound-related problems were often uncontrollable and unpredictable, as they could appear at any time during the day or night, despite strategies to control the issues. It slowly became more and more of a challenge for the women to contain and disguise odor and exudate (Probst et al., 2012). In addition, the rates of prevalence for nausea or vomiting were recorded as 37% and 13% after 24 hours and 70% and 15% during days 2-5 (Booth et al., 2007). Therefore, the patient must have an excellent coping ability to survive the disease and the side effects of therapy.

Attributes are crucial features that assist in distinguishing one concept from others and clarifying its meaning. The search results revealed several resilience attributes in breast cancer patients, including coping with the disease and cancer treatment, satisfaction with social support, and optimism. Coping is "ongoing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the person's resources" (Lazarus, 1993). Coping strategies used during the diagnostic phases of breast cancer are indicators of psychological adjustment after surgery (Drageset et al., 2010). A patient who has good psychological adjustment would solve the problem and seek support as their coping mechanism (Werdani & Silab, 2020). Early intervention could assist patients in controlling cancer-related stress through effective coping mechanisms that could boost their resilience (Borgi et al., 2020).

Social support provided by social engagement initiatives has the ability to improve coping mechanisms, resilience, and social connectedness, as well as have positive benefits on both physical and mental health (Steptoe & Fancourt, 2019). According to Lam et al. (2010), there exists a positive correlation between optimism and resilience among individuals diagnosed with cancer. According to Seiler and Jenewein's (2019) study, a positive outlook and positive initial treatment outcomes were indicative of resilience and reduced distress in female breast cancer patients. According to Stewart and Yuen (2011), resilience will be achieved when individuals manage to maintain or regain their mentality in significant difficulties or risks. Therefore, those three-concept play a vital role in developing resilience, especially in breast cancer patients.

The results or ramifications manifest as the level of well-being and the positive psychological changes following a traumatic event. The concept of quality of life, specifically pertaining to health, has been operationalized as the subjective evaluation of breast cancer patients regarding their physical, mental, and social well-being, which is impacted by factors such as diagnosis, treatment, post-treatment, and survivorship. This evaluation is typically conducted using rigorously validated instruments (Mokhatri-Hesari & Montazeri, 2020). The impact of psychological resilience on various domains of health-related quality of life is noteworthy. Patients who exhibit greater resilience tend to experience a notably higher quality of life across a wide range of dimensions pertaining to their overall well-being (Ristevska-Dimitrovska et al., 2015). Post-traumatic growth is a phenomenon that is observed when an individual is able to derive positive meaning from a traumatic event that has caused significant distress. This implies that the extent of the trauma experienced by the survivor is a crucial factor in determining the likelihood of post-traumatic growth. Individuals who exhibit high levels of resilience may have a decreased tendency to perceive threats to their personal or ideological beliefs. Consequently, individuals who possess greater resilience are better equipped to mitigate the impact of such events, thereby highlighting the necessity of providing education (Jannat et al., 2022; Levine et al., 2009).

5. Implications and limitations

This concept analysis of resilience in breast cancer patients helps nurses develop holistic patient-centered nursing interventions to enhance the resilience of breast cancer patients. Nurses working with breast cancer patients may find resilience and its attributes for the assessment and implement the nursing intervention. This study suggests that resilience is an important concept in improving the quality of life and post-traumatic growth in breast cancer patients. Despite its universal approach, the current concept analysis also has its limitation. As our literature search was based on mostly English-language academic databases, our perspective might be biased toward non-English academic literature.

6. Conclusion

This concept analysis provides in-depth insights into resilience among breast cancer patients. Resilience reduces adversity and facilitates transition after a life crisis. Identification from the literature reveals that significant characteristics of resilience in breast cancer patients include coping with the disease and treatment, optimism, and satisfaction with social support. Furthermore, the body image issue after mastectomy, symptoms of distress, cancer-related stigma, and fear of cancer recurrence are identified as antecedents, and quality of life and post-traumatic growth are consequences of breast cancer patients' resilience. The CD-RISC, RS, and RSA are the referent tools to measure resilience among breast cancer patients. Identifying attributes, antecedents, consequences, and empirical referents of resilience makes further research and clinical service clearer.

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Author contribution

FEJ: Data curation, formal analysis, software, visualization, writing – original draft. ALW: Software, validation. NA: Validation, writing – review & editing.

Conflict of interest

No conflict of interest to be declared.

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Appendix

Table 1. Description of the articles and their contributions to the concept analysis

No.	Title	Author/Year	Methodology	The study's contribution to the concept analysis	Contribution
1.	The influence of symptoms, uncertainty, family support on resilience in patients with breast cancer receiving chemotherapy	Ahn (2016)	Quantitative	Family support was identified as the primary predictor variable of resilience.	Antecedent
2.	Religiosity, Psychological Resilience, and Mental Health Among Breast Cancer Patients in Kingdom of Saudi Arabia	Al Eid et al. (2020)	Quantitative	The findings indicate that there exist significant statistical correlations between psychological resilience and quality of life.	Consequences
3.	Predictors of resilience in women treated for breast cancer: A prospective study	Bennett et al. (2012)	Quantitative	The presence of distress symptoms was identified as a significant predictor of resilience.	Antecedent
4.	Mediating Role of Social Support in Resilience and Quality of Life in Patients with Breast Cancer: Structural Equation Model Analysis	Celik et al. (2021)	Quantitative	The relationship between resilience and functional quality of life was found to be partially mediated by social support.	Antecedent
5.	Resilience in breast cancer survivors: Depression, anxiety, and quality of life after treatment	Deshields et al. (2006)	Quantitative	A significant proportion of female participants demonstrated resilience by exhibiting minimal levels of distress.	Antecedent
6.	Predictive features of resilience in early breast cancer young patients: Experience in real life	Di Giacomo (2018)	Quantitative	The capacity of the patient to manage a diagnosis of breast cancer is a prognostic factor that exhibits a stronger correlation with emotional traits.	Attributes
7.	Moderate stress exposure is associated with psychological resilience among breast cancer survivors	Dooley et al. (2017)	Quantitative	The phenomenon of stress can potentially contribute to the development of resilience, provided that it is experienced within a finite timeframe.	Antecedent
8.	Characteristics of psychological resilience and body image in women in the early and late periods after mastectomy	Izydorczyk et al. (2018)	Quantitative	The study participants exhibited superior coping strategies for managing setbacks and adverse emotional states, indicating a heightened capacity for disengagement from challenging circumstances and alterations in their physical appearance.	Antecedent, Consequences

Table 1. Continued

No.	Title	Author/Year	Methodology	The study's contribution to the concept analysis	Contribution
9.	Mechanisms of psychological resiliency in women after mastectomy	Kaczmarek et al. (2012)	Quantitative	The present study aims to elucidate the relationship between coping strategies and the impact of resiliency on life satisfaction among women who have undergone mastectomy. This discovery offers supplementary proof of the essential function of coping mechanisms in the mechanisms of resilience.	Attributes
10.	Minority stress, psychosocial resources, and psychological distress among sexual minority breast cancer survivors	Kamen et al. (2017)	Quantitative	The study suggests that there is a positive correlation between heightened minority stress and reduced psychosocial resources, such as resilience and social support, with increased psychological distress among breast cancer survivors who identify as sexual minorities.	Attributes, Consequences
11.	The causal relationship between perceived stress, perceived social support, and resilience with emotional adaptation mediated by body image of breast cancer patients	Kiaei et al. (2021)	Quantitative	The mediating function of body image is observed in the correlation between perceived social support, perceived stress, and resilience with life satisfaction.	Antecedent, Attributes, Consequences
12.	Functional Impairments in the Mental Health, Depression and Anxiety Related to the Viral Epidemic, and Disruption in Healthcare Service Utilization Among Cancer Patients in the COVID-19 Pandemic Era	Kim et al. (2022)	Quantitative	A statistically significant correlation was observed between reduced resilience and heightened anxiety in response to the COVID-19 pandemic.	Antecedents
13.	Computational Models for Predicting Resilience Levels of Women with Breast Cancer	Kourou et al. (2021)	Quantitative	This study aims to investigate the clinical outcomes, quality of life, and patient well-being of women with breast cancer. The analysis will consider various factors, including biological, social, environmental, occupational, and lifestyle factors, to predict resilience in this population.	Consequences

Table 1. Continued

No.	Title	Author/Year	Methodology	The study's contribution to the concept analysis	Contribution
14.	Do resilient breast cancer patients experience post-traumatic growth?	Lee et al. (2016)	Quantitative	The study found that a strong sense of resilience was linked to decreased levels of overall distress, but not specifically distress related to cancer. In general, the findings indicate that possessing a moderate degree of resilience could potentially serve as a safeguard against depression and promote personal development.	Antecedent, Attributes, Consequences
15.	Resilience as a predictor for emotional distress and quality of life during neoadjuvant chemotherapy in women with breast cancer	Lee et al. (2017)	Quantitative	A heightened level of resilience may serve as a protective factor for patients experiencing elevated emotional distress and help to sustain their quality of life while undergoing neoadjuvant chemotherapy. The implementation of psychosocial interventions aimed at enhancing resilience could potentially prove beneficial in ameliorating emotional distress and improving overall quality of life.	Antecedent, Consequences
16.	The mediating and moderating roles of resilience in the relationship between anxiety, depression, and post-traumatic growth among breast cancer patients based on structural equation modeling: An observational study	Li et al. (2020)	Quantitative	The study found significant correlations between resilience and anxiety, depression, and post-traumatic growth (all $P < .01$).	Antecedent, Consequences
17.	Nurse care and resilience in women with breast cancer in adjuvant chemotherapy	Menezes et al. (2013)	Qualitative	The identified risk factors and protective factors included chemotherapy, fatigue, illness, prolonged hospitalization, alopecia, nausea, substance addiction, inadequate familial support, emotional suppression, and a self-perception of invincibility.	Attribute, Antecedent
18.	Psychological Resilience and Health-Related Quality of Life in Swedish Women with Newly Diagnosed Breast Cancer	Mohlin et al. (2020)	Quantitative	The study found a significant positive correlation between psychological resilience and health-related quality of life (HRQoL) among Swedish women who were recently diagnosed with breast cancer. No modifying factor was detected in this relationship.	Consequences

Table 1. Continued

No.	Title	Author/Year	Methodology	The study's contribution to the concept analysis	Contribution
19.	Psychological Resilience and Health-Related Quality of Life in 418 Swedish Women with Primary Breast Cancer: Results from a Prospective Longitudinal Study	Mohlin et al. (2021)	Quantitative	The study findings indicate that there exists a positive correlation between resilience and Health-Related Quality of Life (HRQoL) one year after diagnosis. This suggests that resilience plays a crucial role in sustaining HRQoL.	Consequences
20.	Capacity of resilience during radiotherapy treatment in breast cancer	Muñoz Carmona et al. (2018)	Quantitative	Resilience has been found to be associated with body image following mastectomy and standard radiotherapy treatment.	Antecedent
21.	The relationship between emotional expression and resilience in a long-term telephone group for women with secondary breast cancer	O'Brien et al. (2013)	Quantitative	The issue of family and friend relationships is a prominent concern for individuals who have been diagnosed with cancer.	Antecedent
22.	Structure Equation Modeling for Resilience in Patients with Breast Cancer	Rim et al. (2021)	Quantitative	Management strategies aimed at improving the resilience of breast cancer patients should focus on factors such as patients' optimism, spiritual well-being, hope, and symptom experience.	Attributes
23.	The influence of resilience on anxiety, depression and quality of life in women with breast cancer before neoadjuvant chemotherapy	Son et al. (2017)	Quantitative	The independent contribution of resilience to a decreased level of anxiety and depression, as well as an increased level of quality of life, has been observed in breast cancer patients prior to neoadjuvant chemotherapy.	Antecedent, Consequences
24.	The effects of personality traits and resilience on quality of life in breast cancer survivors	Song et al. (2021)	Quantitative	The association between quality of life and personality profiles was moderated by resilience.	Antecedent, Consequences
25.	Stress Management and Resilience Training (SMART) program to decrease stress and enhance resilience among breast cancer survivors: A randomized trial	Sood et al. (2012)	Quantitative	At the 12-week mark, a statistically significant causal relationship has been observed between resilience, perceived stress, anxiety, and overall quality of life.	Antecedent, Consequences
26.	The effect of cognitive behaviour therapy on resilience and quality of life in women suffering from breast cancer	Srivastava et al. (2016)	Quantitative	Cognitive Behavioral Therapy (CBT) holds clinical significance in enhancing resilience and augmenting the quality of life among individuals who have survived breast cancer. Additionally, it can serve as a supplementary approach to augment conventional oncologic therapy and enhance the rapport between healthcare providers and patients.	Antecedent

Table 1. Continued

No.	Title	Author/Year	Methodology	The study's contribution to the concept analysis	Contribution
27.	Resilience and positive psychological changes after a cancer diagnosis and treatment	Tu (2018)	Quantitative	The results underscored the significance of cultivating resilience and adaptive coping mechanisms in breast cancer survivors, as these factors are associated with enhanced psychological growth and overall well-being.	Attributes Consequences
28.	Resilience and spiritual growth of Chinese recovering from breast cancer: The mediating role of challenge cognitive appraisals and positive affectivity	Wan et al. (2015)	Quantitative	Breast cancer patients who exhibit resilience have reported experiencing spiritual growth, which can be attributed to their perception of the illness as a challenge and their capacity to experience positive emotions in the face of trauma.	Consequences
29.	The factors influencing psychological resilience in breast cancer patients undergoing mastectomy and the effects of mindfulness-based stress reduction on the patients' psychological resilience and anxiety	Wang and Zhang (2020)	Quantitative	There exists a negative correlation between an individual's psychological resilience and their level of anxiety. The implementation of Mindfulness-Based Stress Reduction (MBSR) has the potential to improve the psychological resilience of patients and alleviate their symptoms of anxiety.	Antecedent
30.	Resilience and Associated Factors among Mainland Chinese Women Newly Diagnosed with Breast Cancer	Wu et al. (2016)	Quantitative	The study found a positive correlation between resilience and both social support and optimism.	Antecedent, Consequences
31.	The Relations Between Stigmatization and Mindfulness with Psychological Well-Being Among Working Women Diagnosed with Breast Cancer: The Role of Resilience	Ocel (2017)	Quantitative	The study conducted a moderated regression analysis and found that the impact of stigmatization on quality of life was moderated by resilience.	Antecedent, Consequences
32.	Exploring the psychosocial morbidity of women undergoing chemotherapy for breast cancer in a post-war setting: experiences of Northern Sri Lankan women	Rajasooriyar et al. (2021)	Quantitative	In addition to the acute consequences of chemotherapy, individuals contended with issues related to their physical appearance, societal disapproval, and reliance on others, all while navigating apprehensions regarding the well-being of their loved ones and the financial burden of cancer treatment.	Antecedents

Table 1. Continued

No.	Title	Author/Year	Methodology	The study's contribution to the concept analysis	Contribution
33.	The relationships between fear of cancer recurrence, spiritual well-being and psychological resilience in non-metastatic breast cancer survivors during the COVID-19 outbreak	Koral and Cirak (2021)	Quantitative	Breast cancer survivors who exhibit high levels of subjective well-being (SWB) and psychological resilience tend to experience lower levels of fear regarding cancer recurrence, even in cases where they have been unable to maintain regular medical follow-up due to the COVID-19 pandemic.	Antecedent
34.	Fear of cancer recurrence, optimism and trait resilience predict emotional and physical functioning in breast cancer survivors	Peters and Markovitz (2019)	Quantitative	The present study examines the relationship between fear of cancer recurrence, optimism, and trait resilience, and their impact on the emotional and physical functioning of breast cancer survivors. The findings suggest that these factors play a significant role in predicting the emotional and physical well-being of breast cancer survivors.	Antecedent, Attributes
35.	Pathways to post-traumatic growth in cancer patients: moderated mediation and single mediation analyses with resilience, personality, and coping strategies	Gori et al. (2021)	Quantitative	The study found that the degree of resilience exhibited by individuals was a significant predictor of post-traumatic growth (PTG) and post-traumatic symptoms, both through direct and indirect pathways. The mediating role of various coping strategies was also observed.	Attributes, Consequences
36.	Relationships between family resilience and post-traumatic growth in breast cancer survivors and caregiver burden	Liu et al. (2018)	Quantitative	The results of our study suggest that there is a need for interventions aimed at promoting family resilience, fostering post-traumatic growth (PTG) among individuals who have survived breast cancer, and reducing the burden of caregiving on family members.	Consequences
37.	Resilience and quality of life in breast cancer patients	Ristevska-Dimitrovska et al. (2015)	Quantitative	Breast cancer patients who exhibit lower levels of resilience tend to experience poorer body image and future outlook, as well as more severe adverse effects of systemic therapy, including arm and breast symptoms. Patients exhibiting higher levels of resilience tend to experience a notably enhanced quality of life across a wide range of domains pertaining to their overall well-being.	Antecedent, Consequences

Table 1. Continued

No.	Title	Author/Year	Methodology	The study's contribution to the concept analysis	Contribution
38.	Body image satisfaction, distress and resilience in women with breast cancer surgery: A within group study	Mushtaq and Naz (2017)	Quantitative	The study found notable variations in body image contentment, distress, and resilience between the pre and post evaluations of females who underwent breast cancer surgery.	Antecedent, Consequences
39.	Trajectories of psychological distress among Chinese women diagnosed with breast cancer	Lam et al. (2010)	Quantitative	Resilience to distress was predicted by optimism and improved early post-operative treatment outcomes.	Antecedent, Attributes
40.	Relationship between Resilience, Psychological Distress and Physical Activity in Cancer Patients: A Cross-Sectional Observation Study	Matzka et al. (2016)	Quantitative	Cancer patients who exhibit greater resilience, particularly those in advanced age cohorts, tend to report lower levels of psychological distress.	Antecedent
41.	Psychological distress and resilience in women diagnosed with breast cancer in Greece	Fradelos et al. (2017)	Quantitative	Based on our findings, it appears that resilience may have an adverse impact on depressive symptomatology.	Antecedent
42.	Resilience as a predictor for emotional response to the diagnosis and surgery in breast cancer patients	Markovitz et al. (2015)	Quantitative	The presence of resilience may offer a degree of safeguarding against the experience of emotional distress among individuals diagnosed with cancer. The results of our study indicate that resilience could potentially be considered as a trait that exhibits stability and is not susceptible to the influence of adverse circumstances.	Antecedent
43.	Symptom Distress and Coping in Young Korean Breast Cancer Survivors: The Mediating Effects of Social Support and Resilience	Lee and Kim (2018)	Quantitative	The development and availability of intervention methods that reinforce resilience and offer social support can be beneficial in improving the coping mechanisms of young breast cancer survivors who frequently experience distress.	Antecedents Attributes
44.	Resilience Among Breast Cancer Survivors of Different Sexual Orientations	Bazzi et al. (2018)	Quantitative	The results of this study indicate that interventions aimed at enhancing the quality of life and well-being of cancer survivors from various backgrounds could potentially utilize social support and other resilience-related factors.	Attributes Consequences
45.	Post-traumatic growth in breast cancer survivors: New insights into its relationships with well-being and distress	Ruini et al. (2013)	Quantitative	The levels of post-traumatic growth were found to be higher among survivors of breast cancer, and this was observed to be linked with a reduction in psychological distress and an increase in resilience.	Antecedent Consequences

Table 1. Continued

No.	Title	Author/Year	Methodology	The study's contribution to the concept analysis	Contribution
46.	Empirical analysis of post-Traumatic growth status and influencing factors for breast cancer inpatients base on post-traumatic growth inventory	Fang et al. (2017)	Quantitative	The results of the correlation analysis indicate that there is a statistically significant positive correlation ($P<0.01$; $P<0.05$) between the post-traumatic growth (PTG) experienced by breast cancer patients and their levels of self-management efficacy and resilience.	Consequences
47.	The mediating and moderating roles of resilience in the relationship between anxiety, depression, and post-traumatic growth among breast cancer patients based on structural equation modeling: An observational study.	Li et al. (2020)	Quantitative	The study found that there were significant correlations between resilience and anxiety, depression, and post-traumatic growth (all with a P-value of less than 0.01).	Attributes Consequences
48.	Breast cancer: a manual for a proposed group treatment integrating evidence-based resilience factors	Friborg et al. (2005)	Quantitative	The treatment objectives for breast cancer patients with regards to their psychological resilience involve facilitating the acquisition of novel coping mechanisms to alleviate stress, augmenting their personal and social aptitude, and promoting the utilization of existing social support systems. Additionally, the goals include improving family cohesion, fostering optimism and enhancing the quality of life. Furthermore, the treatment aims to assist patients in developing new values and priorities that align with their present and future life circumstances.	Antecedent Attributes Consequences
49.	Psychological resilience of women after breast cancer surgery: a cross-sectional study of associated influencing factors	Huang et al. (2019)	Quantitative	The positive impact of physical exercise of moderate intensity, self-efficacy, family hardiness, and social support on the promotion of disease rehabilitation and improvement of quality of life is well-established. Specifically, these factors have been found to have a positive effect on PR.	Attributes Consequences
50.	The Relationship between Resilience with Self- Compassion, Social Support and Sense of Belonging in Women with Breast Cancer	Alizadeh et al. (2018)	Quantitative	The present study elucidated the impact of self-compassion, social support, and sense of belonging on the resilience of Iranian women diagnosed with breast cancer.	Attributes

Table 1. Continued

No.	Title	Author/Year	Methodology	The study's contribution to the concept analysis	Contribution
51.	Quality of life and personal resilience in the first two years after breast cancer diagnosis: systematic integrative review	Edward et al. (2019)	Review	Several factors were found to predict higher levels of quality of life and personal resilience, including younger age, disease progression at initial presentation, personality traits such as optimism, and various moderating factors such as social support, clinical interventions, and the development of self-management skills.	Attributes Consequences
52.	"He would never let me just give up": Communicatively Constructing Dyadic Resilience in the Experience of Breast Cancer	Lillie et al. (2018)	Qualitative	The findings indicate that the communication between couples has a dual effect on resilience, as it can both facilitate and impede it.	Attributes
53.	Mediator Roles of Social Support and Hope in the Relationship Between Body Image Distress and Resilience in Breast Cancer Patients Undergoing Treatment: A Modeling Analysis	Hsu et al. (2021)	Quantitative	The study found that social support played a partially mediating role in the association between body image distress and resilience.	Attributes Antecedent

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ORIGINAL RESEARCH

Parents' Experiences of Caring for Children with Congenital Rubella Syndrome (CRS) in Remote and Rural Areas of Indonesia

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Abstract

Background: Parents of children with Congenital Rubella Syndrome (CRS) in rural areas face limited access to medical care and specialised services, financial difficulties, social isolation, and stigma. Research on their experiences is limited.
Purpose: This study explores parents' experiences of caring for their children with CRS in rural areas of Indonesia.
Methods: The research used a descriptive phenomenological approach, purposive sampling to collect parents of children with CRS from the shelter, and snowball sampling for other participants. Inclusion criteria included parents who cared for CRS children over than two years old, could express their experiences, and spoke Indonesian. Twenty-five parents participated in an in-depth semi-structured interview. The data were analysed using the Colaizzi method.
Results: This research found that parents caring for sick children in rural areas experienced life-altering situations that affected their mental health. In addition, caring for sick children also caused emotional disturbances and tension in family life. Other challenges included getting proper treatment for their child, especially in remote rural areas, and difficulty to reach health services. Therefore, proper mental health treatment and support were essential for parents who cared for sick children in rural areas.
Conclusion: This study describes complexities of parents' experiences of caring for children with CRS, such as difficulty to accept the child's condition and feeling burdened by their child's case. Further studies are needed to understand cultural influences and expand the study area.

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1. Introduction

Congenital rubella syndrome (CRS) is an infant disease caused by infection with the rubella virus in the mother during pregnancy (Lanzieri et al., 2020). Globally, based on the World Health Organization's report in 2020, the number of CRS cases was 603; in Southeast Asia, it was 248. In Indonesia, it was 110 cases, which made Indonesia the country with the most significant number of CRS cases in Southeast Asia (World Health Organization, 2021). The existing CRS case data shows that this problem can significantly pressure children and families regarding symptom management, emotional burden, and treatment costs.

Early recognition of CRS cases is significant for patients. However, identifying cases of CRS is difficult because clinical symptoms such as sensory disturbances, endocrinopathy, and thyroid often appear later (Wondimeneh et al., 2018). In addition, the characteristics of CRS, such as cataracts, congenital heart disease, hearing loss, and developmental delays, can lead to worsening chronic disease (Nahar et al., 2020).

Parents' burden while caring for a child with a CRS hurts their emotional, social, financial, physical, and spiritual functioning. A study in the Philippines explains that the average health cost for children with CRS in the 16-14 months age is US$ 7.45; most of the costs come from treating heart complications, with the highest average being US$ 2.12 to US$ 15.5 (Tan & Leon, 2023). Reports from Ethiopia show that parents who care for children with congenital abnormalities due to CRS experience high emotional stress (Taye, 2021). Studies in America show that parents who care for children with CRS who experience high caregiver stress have a poorer overall quality of life (Armstrong, 2015). Studies of parents' experiences of caring for CRS children show that they experience emotional stress, need family support, lack knowledge, and try various ways to help their children (Leon et al., 2018).

The problems faced by parents when caring for children with CRS in the Indonesian context are increasingly complex, considering that currently, Indonesia still has remote areas (left behind =left behind, leading/farthest=remote, and outermost=frontier/outermost) consisting of 9 provinces (out of 34 regions) defined by government regulations (Ministry of National Development Planning of Indonesia, 2020). These underdeveloped areas need more resources for health workers; only a portion of the population has received national health insurance services (Wenang et al., 2021). Therefore, it is difficult for parents to bring their children to health facilities and get proper treatment. In addition, due to limited facilities, this study shows the disparity of health facilities in Indonesia, where adults living in urban areas tend to use hospital outpatient facilities 1,246 times higher than adults living in remote areas. Furthermore, the possibility of simultaneously using outpatient and inpatient facilities for adults living in urban areas is 1.134 times higher than in rural areas (Wulandari et al., 2022).

CRS has various clinical patterns and treatment modalities, and early recognition of cases of CRS is significant for patients. In rural areas, the problem of CRS is complex because of the need for more detection tools, human resources to provide long-term care, and surveillance funds so that early detection of cases is not optimal (Brown et al., 2020). Parents' various complex problems in raising children with CRS require a comprehensive study to provide appropriate psychological assistance so parents can take good care of their children. Little information is available from previous studies about the experiences of parents caring for children with CRS, especially in remote areas that require access to health resources. Therefore, this study explores parents' experiences of caring for their children with CRS in underdeveloped regions of Indonesia.

2. Methods

2.1 Research design

This study used a descriptive phenomenological method that systematically describes the structure of a phenomenon reflected in the participants' life experiences by using language that reflects the transformation of the participants' natural expressions (Bartholomew et al., 2021).

2.2 Setting and participants

The study was conducted in January-June 2022. Determination of participants in this study was done using the purposive sampling technique. The researcher collected parents with CRS children from the shelter where the patients lived during their child's referral care in Jakarta. In addition, the researchers used a snowball sampling technique to recruit one participant to another based on the inclusion and exclusion criteria of the study to track participants through associations of parents with children suffering from CRS.

The participants of this study were parents with CRS children from the provinces of East Java, South Kalimantan, East Kalimantan, East Nusa Tenggara, Papua, Southeast Sulawesi, and West Sumatra. Participants included in this study were parents who (1) cared for a child with CRS for more than two years, (2) could reveal their life experiences, and (3) could speak Indonesian. This study used a sample of 25 participants aged 30-40 years who were recruited in different numbers from seven regions according to the availability of participants and the fulfillment of inclusion criteria to increase the variety of participants' demographic backgrounds, broaden research subjects from the various areas, and allow the birth of diverse experiences.

2.3 Measurement and data collection

The interview process in this study was conducted face-to-face and via video conference through the Zoom application conducted by three researchers. The researcher visited the participants for face-to-face interviews and contacted the interviewees via the Zoom application before the interview to ensure that the participants met the inclusion criteria. The researcher also conducted a preliminary assessment, explained the research, and provided an interview time contract. Interviews were conducted with 25 participants. Data saturation was reached in the 23rd participant when the participants' answers during the interview remained consistent.

The researcher used questions from the interview guide to help focus on the interview. The method used in this research was in-depth interviews with semi-structured interview techniques where the questions were not asked in a specific order but were asked based on the conversation that appeared, and each statement was explored in detail to get the meaning according to the research objectives. Two researchers conducted the interview process for 45-60 minutes separately for each participant. The participants submitted a recording permit to record voices during face-to-face interviews in Jakarta in February 2022. Video recording was recorded during interviews via the Zoom application in March-May 2022. The researcher used open-ended questions and tried to understand the phenomenon from the participants' perspectives without giving opinions, criticisms, and evaluations during the interview. Some of the questions in the interview included (a) How do you feel about trying to care for a child with CRS?, (b) What obstacles are experienced when caring for a child with CRS?, (c) What treatment efforts have been made so far?, (d) What support is received from the closest people, the government, and the surrounding community?, (e) What are the expectations regarding the childcare process in the future?.

2.4 *Data analysis*

The pre-recorded data was transcribed verbatim. Next, the researcher listened to the recordings to improve the accuracy and reliability of the data. Data were analysed using the Colaizzi method (Sanders, 2014). In the first stage of the analysis, seven researchers (PKST, HMAD, EF, YMKL, MYB, MYG, AMG) reread the transcribed data, focusing on the context of the data and participants' responses and selecting significant statements. Then, similar words were grouped into the same category, followed by theme extraction by similar grouping categories based on factual statements. Five researchers collected and analysed data simultaneously (PKST, HMAD, EF, YMKL, MYB). In this study, the interviews were conducted until saturation was reached so no new content emerged in the discussions, and the same concepts and themes appeared in the data analysis.

2.5 *Trustworthiness*

The data validity in this study is maintained based on Cypress's (2017) following steps; (1) Dependability, seven researchers conducted the research by discussing the appropriate method related to the study approach, data analysis, and data interpretation. Three researchers with previous qualitative study experience focused on developing appropriate methods. Three researchers extracted significant ideas from participants about their specific experiences when interpreting the data. In contrast, four researchers were explicitly tasked with reviewing the transcribed material to validate themes and appropriate descriptions. If the identified theme is different, it is agreed not to use it. (2) Credibility was fulfilled using prolonged involvement of researchers and persistent observations to study the context of existing phenomena and minimise distortions that might infiltrate the data. To achieve this, the two researchers spent six months with the participants to build trust and rapport with them, participants, throughout the data collection process. The same questions were asked in different forms to allow for repeated identification during interviews and analysis. Peer debriefing was conducted through meetings and discussions among the seven researchers to find deficiencies in research activities. In addition, a source triangulation process was carried out from previous studies to ensure the correctness of the data. (3) Confirmability is carried out by member checking with participants to ensure the data is complete, representative, and written without the researcher's bias. In addition, authors with different academic and clinical backgrounds and interests read and discussed each other's interpretation of the data each week, which helps identify implicit concepts. (4) Transferability to measure whether or to what extent study results can be applied in other contexts, circumstances, and settings. It was done by expanding study locations, increasing the diversity of participant demographic status, and using a purposive sampling technique. Moreover, the recorded data was carefully transcribed by five researchers. During the analysis phase, all aspects of the analysis were documented. Analysis refers to the categorisation and organisation of information in such a way as to understand the data and to write a true and accurate final report.

2.6 *Ethical consideration*

Ethical clearance and research permission were obtained from Universitas Citra Bangsa with a reference number of 5/UCB.FIK/01.01/2022. Each recruited participant had received an explanation of the purpose and benefits of the research and signed a research consent letter.

3. Results

3.1 Demographic data of participants

Table 1 shows that the majority of participants were aged 20-30 (76%), females (64%), senior high school graduates (52%), homemakers (64%), and Muslim (68%). Participants mostly came from East Java, with a presentation of 32%. The majority of illness duration is 2-10 years (64%), and the diagnosis of most children's diseases is congenital heart defects (52%).

Table 1. Characteristics of participants

Characteristics	n (%)
Age (Year)	
20-30	19 (76)
30-40	6 (24)
Gender	
Female	16 (64)
Male	9 (36)
Education	
Elementary school	5 (20)
Junior High School	5 (20)
High School	12 (48)
College	3 (12)
Profession	
Homemakers	16 (64)
Farmer	2 (8)
Civil Servant	2 (8)
Driver	2 (8)
Domestic Workers	3 (12)
Religion	
Islam	17 (68)
Protestant	5 (20)
Catholic	3 (12)
Origin of Participants	
East Java	8 (32)
South Kalimantan	2 (8)
East Kalimantan	2 (8)
East Nusa Tenggara	3 (12)
Papua	1 (4)
Southeast Sulawesi	4 (16)
West Sumatera	5 (20)
Child's Disease Duration (years)	
2-10	16 (64)
11-20	9 (36)
Diagnosing children's diseases	
Congenital Heart Abnormalities	13 (52)
Eye Anomaly	4 (16)
Sensorineural Hearing Loss	4 (16)
Bone Defects	4 (16)

This study produced four themes which can be seen in Figure 1.

3.2 Theme 1: Life-changing situations

Parents finally accept their child's congenital disabilities caused by CRS. This situation changed their lives due to their difficulty caring for them and the social stigma. There are four sub-themes in this theme: it is hard to accept the reality, overwhelmed by new situations, learning to understand children's conditions, avoiding bad stigma.

Life-changing situations	It is hard to accept the reality Overwhelmed by new situations Learning to understand children's conditions Avoiding bad stigma
Emotional disturbance	The daily anxiety of losing a child Confrontation with sadness Dealing with uncertainty
Tension in family life	Barriers to family relationships Loss of family income source The increased family debt burden Divorce
The challenge of getting treatment	Difficult access Lack of resources Wrong regional political policy Using shaman

Figure 1. Summary of themes and subthemes

3.2.1 It is hard to accept reality

Parents have high hopes for their child before birth but have difficulty accepting it at birth with CRS. Participants expressed the following statements: *I rejected my child's condition and considered it normal, like other children, for six months* (P4); *My husband and I thought our son was normal for some time* (P7).

3.2.2 Overwhelmed by new situations

The birth of a child with CRS is new for some parents who feel overwhelmed by their child's complex problems. Participants expressed the following statements: *The first child is normal, and I feel overwhelmed caring for the second child with CRS* (P13); *My son's diagnosis is very complex so I am confused about how to treat it* (P16).

3.2.3 Learning to understand children's conditions

Parents often do not understand their child's condition when they are under pressure due to change but learn quickly to help overcome their child's problems. Two participants stated: *Learning about childhood illnesses and how to deal with them is important and must be done quickly* (P21); *Children get sick easily, I learned to measure body temperature and give warm compresses when they have a fever* (P15).

3.2.4 Avoiding bad stigma

Conditions experienced by children, such as mental disorders, make children get a bad stigma from the community; parents' efforts to protect their children limit themselves from social activities for fear of getting wrong statements from the community. Participant expressed the following statements: *I avoid activities where there are many people; I am not active in neighbourhood meetings because of society's statements that call my child a stupid monkey* (P7); *I have never featured my child on social media or brought him to church for worship; I have heard someone say my child has no future* (P11).

3.3 Theme 2: Emotional disturbance

Various emotional problems are expressed by parents when dealing with child's condition. It makes parents stuck with a variety of emotional issues. This theme has three subthemes: daily anxiety of losing a child, confrontation with sadness, and dealing with uncertainty.

3.3.1 The daily anxiety of losing a child

When a child is seriously ill, parents worry about the possibility of the child dying. Life-threatening illness raises the harsh reality parents face about possibly losing a child. Two participants stated: *When my child suffers from a severe decline in physical condition, I realise that, at any time, due to the development of the disease, or a crisis, it may result in me losing my child* (P1); *We are part of a parent group with a child with CRS, when a fellow parent reported that their child had died, I was worried that this would happen to my child* (P17).

3.3.2 Confrontation with sadness

Despite the imminent threat of losing a child, parents must always deal with the loss and sadness associated with their child's physical weakness. They must constantly adapt their own lives to fulfill their nurturing role. Participants expressed the following statements: *It can be tough when your child is sick and can't attend school, eat alone, or communicate. It can be difficult even if you try to escape the situation* (P20); *Due to breathing difficulties and hospitalisation, he could not celebrate his birthday with his friends. Sometimes I feel sad, but I hope he can heal from the burden he's been under* (P23).

3.3.3 Dealing with uncertainty

Parents often face the unpredictable course of their child's illness and even the inevitable death. Unclear information about a child's development or physical changes can also lead to feelings of uncertainty and lack of control in parents. Two participants stated: *When dealing with children's conditions, everything that happens to us is uncertain. Sometimes he is healthy, but sometimes sick; everything happens so fast* (P8); *With my son's condition, sometimes I feel optimistic about his physical development, but I also sometimes doubt whether he can live well in the future like my other children* (P23).

3.4 Tension in family life

Caring for a child with CRS affects parents' time, relationships, work, and finances, leading to disruptions in family life and even divorce. This theme consists of four sub-themes: barriers to family relationships, loss of family income source, the increased family debt burden, divorce.

3.4.1 Barriers to family relationships

Parents devote much time caring for CRS children, giving them almost no time to interact with their families. When their attention is reduced to family, they are disliked and considered to have no respect for the extended family. Participants expressed the following statements: *My husband's family considers me a bad wife because, in every activity, my family is less actively involved; my time is spent taking care of children* (P19); *When my in-laws died, my husband and I cared for the children in the hospital and did not attend the funeral. My extended family forced my husband to divorce me because he was not filial to his parents* (P6).

3.4.2 Loss of family income source

Time spent caring for children makes parents have to leave or neglect their jobs, making them lose much income and get fired from work. Participants stated: *I cannot travel; my trip can only be one day. All my activities are scheduled around the house. If I go out, I must return as soon as possible. I lost much income* (P8); *I used to work in a company, but because I often got permission to care for my children, I was finally fired; now I stay at home; our family income is decreasing, and we only depend on my husband* (P13).

3.4.3 Increased family debt burden

One of the biggest challenges in caring for children with CRS who have complex diseases is the high cost of treatment, especially for the medical procedures that the National Health Insurance does not cover. Participants expressed the following: *My wife and I now have a fairly large loan at the bank due to heart surgery and cochlear implants; the costs are very high and are not covered by health insurance* (P19); *I was forced to sell our farmland to pay my child's medical bills and our living expenses during treatment in Jakarta* (P5).

3.4.4 Divorce

CRS child-rearing pressures, such as lack of acceptance of the child's condition, relationship problems with family, loss of income, and increased debt burden, can cause high stress for families and lead to a quick divorce. Participants stated: *Since my child was born and diagnosed with a spinal disorder, my husband divorced me; he accused me of being a cursed woman for giving birth to a disabled child* (P23); *I just got divorced last month; my husband's family forced him to divorce me because he ignored them. After all, he was busy taking care of the children* (P21).

3.5 Theme 4: The challenge of getting treatment

Children with CRS with complex health problems need adequate care; however, it is not easy in remote areas of Indonesia. Participants experience severe barriers to accessing services. Even if they reach them, the benefits are often not quality or effective. There are four sub-themes: difficult access, lack of resources, wrong regional political policy, using shaman.

3.5.1 Difficult access

Parents of children with CRS face difficulties in accessing adequate health services. Factors influencing access include remote location, quality of healthcare facilities and providers, and physician practices. Some families must travel long distances to get the special care their children need. Participants stated: *We need help accessing the pediatrician because we must go to the district town, which takes 2-4 hours away, depending on weather conditions* (P10); *My son has a spinal cord disorder; on our island, there is no neurologist, so we took a boat to the provincial capital; the trip could take a full day* (P5).

3.5.2 Lack of resources

Parents of CRS children must travel long distances to seek emergency medical care because local hospitals do not have the necessary resources. They also feel frustrated that medical staff do not understand the impact of chronic illness. Two participants expressed the following: *Our son was sent home from the hospital's emergency department despite his complex condition and officers focusing on only one symptom* (P14); *My child with a poor respiratory condition requires continuous evaluation, but no chest X-rays are available for a year because they are damaged and have not been repaired* (P11).

3.5.3 Wrong regional political policy

The governance of health services depends on political policies, especially in remote areas, which affect financing and referral systems in health services. Poor parents with CRS children need local health insurance and appropriate referral channels when bringing their children to health care facilities. Participants stated: *Since the change of regent in our district, my health insurance card has yet to be recognised by the hospital; according to them, the new government no longer allocates a budget for it* (P1); *As a health insurance policy, we must follow the primary to secondary health services referral path. However, the government's secondary health services are far from where we live, so transportation costs are expensive* (P7).

3.5.4 Using shaman

Scarcity of access to resources, lack of funds, and parents' distrust of health workers make parents use traditional birth attendants to care for their children. In addition, solid cultural factors make parents prefer shamanic practices to care for their children. A participant stated: *I do not have money to take care of my child, so I choose to use a traditional birth attendant to treat my child with traditional medicine, and so far, I am doing well* (P1). Furthermore, one participant expressed the following:

> *In addition to using health services at the hospital, I took my child to a traditional healer for treatment; I was certain spirits and angry ancestral spirits had possessed my child. I need a shaman to eliminate spirits and make peace with ancestral spirits.* (P23)

4. Discussion

This study explored parents' experiences of caring for children with CRS in underdeveloped areas in Indonesia. Four themes were revealed: (1) Life-changing situations, (2) Emotional disturbance, (3) Tension in family life, and (4) The challenge of getting treatment.

4.1 Life-changing situations

Parenting a CRS child can change a parent's life. Some find accepting their child's condition complex because of the difference between expectations and reality. Parents need time to get their child's condition and focus on their health efforts because they are the primary source of joy, hope, meaning, and purpose in life (Yin et al., 2018). Caring for a child with CRS can be a new experience for parents. Studies show that parents view parenting with severe health problems as a new experience (Nayeri et al., 2021). This experience can have positive consequences if parents accept it well, but it will result in tremendous emotional pressure if parents refuse (Spinelli et al., 2020).

Parents try to learn simple actions to help their sick children. Parents who understand and learn about their child's illness will feel better and happier (Källquist & Salzmann-Erikson, 2019). Parents reported social stigma in the neighbourhood. Support for overcoming stigma can be provided through positive adaptation, spirituality, and encouragement to love self (De los Santos, 2022).

4.2 Emotional disturbance

Parents in this study felt emotional disturbances because they experienced anxiety about losing their child due to the child's declining physical condition. Previous studies have indicated that parents caring for sick or disabled children experience significant psychological and emotional impacts, such as post-traumatic stress and feelings of isolation (Wray et al., 2018). This feeling of anxiety needs to be considered because it will lead to the development of acute stress disorder (ASD) and post-traumatic disorder (PTSD) in parents and interfere with their efforts to care for their children (Nayeri et al., 2021).

Parents of children with complex health conditions may find themselves facing constant grief. However, they are still trying to fight for their son's recovery. This is in line with previous studies, which show that parents tend to give up on their child's illness but still try to make their child recover (Hubert & Aujoulat, 2018).

This study concluded that parents' uncertainty regarding the disease's condition and the child's future often arises. A previous study also showed that parents of children with chronic epilepsy feel diagnostic, asymptomatic, and future uncertainty for their child (Webster, 2019). Therefore, it is necessary to carry out discussions and improvements to overcome the fate of parents and children with such complex conditions. Counselling is used to reinforce hope. The higher the expectations of parents with chronic illnesses, the more confident and passionate they will be in caring for their children (Bell et al., 2019).

4.3 Tension in family life

Pediatric chronic diseases have physical, psychological, social, economic, and behavioural effects on patients and their families that cause a decrease in function and quality of life (Toledano-Toledano & Domínguez-Guedea, 2019). Parents in this study reported that caring for a child with a chronic illness interfered with extended family relationships. Similarly, previous research has shown that caring for children with chronic diseases can damage personal relationships, reduce psychosocial functioning, and cause sleep disturbances (Lian et al., 2022). Loss of income sources is a common problem in caring for children with CRS because it takes up many parents' time (Hatzmann et al., 2014). Parents whose marriages are intact and have high socioeconomic status tend not to feel the adverse effects of loss of income, while single parents are more vulnerable (Brewer, 2018). In addition, the more complex the disease the child suffers from, the more significant the decrease in parental income is because time is devoted to their child (Roddy, 2022). Financial support is urgently needed for low-income families with CRS children, especially in Indonesia, with well-directed and well-controlled financial assistance. Health subsidy programs such as the Healthy Indonesia Card (KIS) can help with childcare. In contrast, social services such as the Family Hope Program (PKH), the Prosperous Rice Program (RASTRA), and village funds can help build community health centres and overcome shortages of medical personnel and equipment (Booth et al., 2019). Declining income and high maintenance costs have left parents in debt, forcing them to sell their assets. Another study shows that caring for a child diagnosed with a chronic illness can hurt the socioeconomic situation of parents (Roser et al., 2019). Further efforts are needed to systematically implement an assessment of parents' financial difficulties with CRS children as part of care services.

Parental tension with CRS children often leads to divorce. Separated parents have broad implications for increased depression, decreased economic status, and reduced family quality of life (Tosi & Albertini, 2019). In the Indonesian context, divorce has a worse impact, especially for women, where there is a harmful cultural construction for divorced women. They get a terrible stigma from society (Saraswati, 2019). Single mothers who take care of children with CRS will certainly become a serious problem when they have to be burdened by their children's condition and the bad stigma of divorce from society. Special assistance is needed for single mothers with children with CRS to suppress the adverse effects of severe psychological disorders.

4.4 The challenge of getting treatment

CRS childcare efforts in remote areas always need help accessing treatment, such as long distances that make it difficult for parents to take their children to health facilities. Financial constraints and expensive public transport also exacerbate this situation (Coombes et al., 2018). Barriers to access to health facilities in underdeveloped areas of Indonesia were also reported by another study, where the failure of TB treatment in Papua was related to the distance or cost of travel to health facilities (Ruru et al., 2018). Loss of treatment for mental disorders in East Java is also associated with the problem of accessibility to health facilities (Tristiana et al., 2018).

In addition to difficult access to services, parents also have difficulty caring for children with CRS due to a lack of health resources. Previous studies have shown that the low capacity of health workers, such as paediatricians, is an obstacle in treating children with chronic illnesses (Altman et al., 2018). In the Indonesian context, it has been reported that limited support from the health system, such as poor staff management and coordination and lack of medical equipment and supplies, are significant barriers to health care (Robbers et al., 2021). Also, security instability resulting from political and armed conflicts, such as in Papua, further impacts service delivery (Rizkianti et al., 2021).

Healthcare efforts are closely related to political policies, especially in health insurance decisions to support Universal Health Coverage (UHC) (Rizvi et al., 2020). The problem in this study is the certainty of health insurance and unclear referral mechanisms for parents. By previous reports, local governments still need help managing the health budget, including unevenly distributed health services and financing that could be more optimal, especially in regional health insurance for low-income and poor people (Kharisma, 2020). Serious efforts are needed from the government to manage the health insurance system to access health services for children with CRS can be more accessible.

When access to an adequate financing system is difficult, parents tend to turn to shamanic practices to care for their children, supported by strong cultural influences. Studies show that dissatisfaction with health services due to high costs, incompetent staff, and difficult access are factors causing Indonesians to choose shamanism as an alternative treatment (An et al., 2020). A people's culture supports shamanism in Indonesia, passed down through oral traditions and shared models of behaviour, which have historically been important for creating a collective faith-based social peace of mind. This is believed to strengthen the effect of non-medical efforts on the quality of human physical endurance (Sukmawan & Sahiruddin, 2021). Setting aside the results of the benefits received by children conveyed by parents and respect for local wisdom is necessary for this treatment to be seen as a complementary method that cannot replace services in health facilities.

5. Implications and limitations

This study provides some implications. Since Rubella in children has complex implications for parents, including high psychological distress, nurses should consider psychological interventions to reduce the risk of depression in parents. The care team can coordinate to provide long-term care. The government must increase health insurance and social assistance financing to overcome parents' economic problems.

We recognise that this report has limitations regarding the number of participants and the geographical area of the study. In addition, the short research time, mostly through online interviews without observation, could affect the depth of reports regarding the psychological conditions experienced, which might affect the physical condition of parents.

6. Conclusion

The results of this study show the complexity of parents' experiences in raising children with CRS. They face difficulties accepting their child's condition and feel overwhelmed by their child's case. In addition, social stigma, emotional distress, and problems accessing health services exacerbate the family's situation. Constraints such as lack of equipment and human resources and changes in political policies also affect access to health services. Further studies are needed to understand the influence of culture in each area and expand the study scope.

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Author contribution

PKST, HMAD, EF, YMKL, MYB, MYG, AMG: study design.
PKST, HMAD: data collection.
PKST, HMAD, EF, YMKL, MYB, MYG: data analysis.
PKST, HMAD, EF, YMKL, AMG: drafting and revision of the manuscript.

Conflict of interest

Contributing authors declare no conflicts of interest.

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REVIEW

Effects of Patient and Family-Centered Care on Quality of Care in Pediatric Patients: A Systematic Review

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Abstract

Background: Patient and family-centered care is one approach that is applied in pediatric care in various hospital settings to improve the quality of care. However, information related to the results of the entire study and its intervention model has not been identified effectively in child health care.
Purpose: This study aimed to describe and assess the effects of patient and family-centered care on the quality of care in pediatric patients.
Methods: A systematic review was used as a method in this study. Seven databases were used, including ScienceDirect, Scopus, ProQuest, EBSCO, Sage Journal, Tailor and Francis, and PubMed to search the literature for relevant published reviews that determined patient and family-centered care interventions between 2011 and 2021. The synthesis without meta-analysis guidelines was used to analyze the data in this review. The data were further analyzed by critically assessing the quality of the articles using the JBI and CASP checklists.
Results: From a total of 29.780 articles identified, fifteen articles were included in this review. Several models of patient and family-centered care interventions were identified, such as family-centered care, family-centered communication program, family-integrated care, family nurture intervention, family empowerment, parent participation, close collaboration, mother-nurse partnership program, and the newborn individualized developmental care and assessment program. From those models, the outcomes for quality of care were related to the pediatric quality of life, length of stay, patient safety, parent satisfaction, parent psychological response, and parent involvement and partnership with staff.
Conclusion: The shreds of evidence indicate that patient and family-centered care can improve the quality of care in the pediatric patients. It is recommended that patient and family-centered care can be implemented in pediatric care by increasing the participation of family during treatment.

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1. Introduction

Children are hospitalized when there is a change in health conditions caused by having an acute or chronic disease that requires health care services (Witt et al., 2014). Young human children are more susceptible to disease because the body's defense system is generally in the growth process compared to adults (Simon et al., 2015). A study stated that children aged 0-3 years experienced 14 types of infections in their lives, of which 71% suffered from respiratory infections, and it was reported that the main cause of these infections came from the host (Vissing et al., 2018). Besides, research reported that a large proportion of mortality in hospitalized children occurs early during admission (Bohn et al., 2016).

During hospitalization, it is important to develop and implement an intervention that is feasible, acceptable, and positively impacts health outcomes (Geerligs et al., 2018). One of the most fundamental changes in pediatric health care is the recognition of the importance of patients' and families' involvement in health care (National Association of Pediatric Nurse Practitioners, 2013). Patient and Family-Centered Care (PFCC) is an approach that recognizes the role of the family in the patient's life and encourages mutually beneficial collaboration between patients, families, and health care professionals (Brown et al., 2008).

PFCC emphasizes partnership in the health care system to improve health quality, safety, and care delivery (Brown et al., 2015). A better understanding of the factors influencing the implementation of the PFCC is an important element in improving its delivery. A study revealed that factors from a health care professional such as inadequate level of experience, high workload, time pressure, and unsupportive attitude are the barriers to patient and family-centered care (Lloyd et al., 2018). This new perspective must overcome perceived barriers and foster a culture of partnership with patient relatives (Van Mol et al., 2017).

PFCC consists of four core components that are associated with outcomes in pediatric patients, i.e., information sharing, social-emotional support, providing care based on family background, and shared decision-making (Gallo et al., 2016). Moreover, Institute for Patient-and Family-Centered Care (2017) states that dignity and respect, information sharing, participation, and collaboration are the core components of PFCC. Previous studies have widely developed some of these components as an intervention model in pediatric care services. The study conducted by Hassanian et al. (2018) and Heo and Oh (2019) used parental participation as a component of PFCC in pediatric care. Meanwhile, Toivonen et al. (2020) used collaboration between parents and staff as an intervention model in PFCC. Although many studies have used PFCC as an intervention model, it needs to be studied more deeply through systematic reviews to obtain solid and reliable scientific evidence. Previously, research related to PFCC intervention models in improving the quality of care had been carried out using a systematic review approach; nevertheless, the focus of the respondents was adult patients. Therefore, the PFCC needs to be further identified related to existing intervention models and its outcomes. Accordingly, this review was conducted to describe and assess the effects of patient and family-centered care on the quality of care in pediatric patients.

2. Methods

2.1 *Research design*

A systematic review was used as a method in this study. The researchers used PICO (Patient, Intervention, Comparison, and Outcomes) to determine the clinical questions (Table 1). PICO is a widely used framework for developing research questions on systematic review (Considine et al., 2017). The research question in this study was "How are the effectiveness of patient and family-centered care in improving the quality of care?"

Table 1. Description of PICO

Patients	Pediatric patients (aged 0-18 years) and their families
Intervention	Aspects of patient and family-centered care, such as those focused on the patient, the family, or both. Also, interventions included components of patient and family-centered care (participation, information sharing, collaboration, and shared decision-making)
Comparison	Usual care
Outcomes	Quality of care resulting from patient and family-centered care interventions for patients and families

2.2 *Search methods*

Literature searching was conducted using seven databases: ScienceDirect, Scopus, ProQuest, EBSCOhost, Sage Journal, Tailor and Francis, and PubMed within the year from 2011 to 2021. Determination of keywords was conducted by using the Boolean operators' technique, i.e. AND and OR to combine words when searching. In addition, the author also used quotations or quotation marks (") and also grouping on similar concepts symbolized by ( ). The keywords used: *("patient and family-centered care" OR "patient-centered care" OR "family-centered care") AND (intervention OR effect) AND ("usual care") AND ("quality of care" OR "clinical outcome") AND (newborn OR children OR adolescent OR teenager).*

2.3 *Inclusion and exclusion criteria*

The inclusion criteria in this study were (1) studies that included pediatric patients aged 0-18 years and their families, (2) accredited international journal, (3) publication year of the journal from 2011 to 2021, (4) articles with experimental design such as quasi-experimental, true experimental, and Randomized Controlled Trials (RCTs), (5) articles are written in English. Meanwhile, the exclusion criteria were (1) articles written in the form of reviews, conference proceedings, protocols, case reports, surveys, and thesis/dissertation, and (2) articles that cannot be downloaded (not fully accessible).

2.4 Screening of articles

Screening articles were conducted by two reviewers (TS and DW). The screening was carried out through several stages, such as identifying keywords in seven available databases, selecting the appropriate title and abstract, and identifying the availability of the full text and its suitability with the existing inclusion criteria. In case of disagreement between TS and DW, a third reviewer (NN) would be involved. NN would reconcile the disagreement to identify and ensure that both reviewers have done the screening process correctly. Reconciliation can play a significant role in ensuring that abstract screeners make the right decision at each stage of the screening process (Polanin et al., 2019).

2.5 Data extraction

Fifteen selected articles were extracted by all reviewers using a grid synthesis format. This format contained some information, i.e., authors, year of publication, country, objective, design, hospital setting, intervention model, duration, results, and components of the patient and family-centered care. All reviewers identified all included articles based on the foregoing information and summarized them in a table (Table 2, Appendix 1).

2.6 Quality assessment of the selected article

The assessment of the quality of studies in this review used tools from the Joanna Briggs Institute (JBI), i.e., the critical appraisal checklist for quasi-experimental research through https://jbi.global/critical-appraisal-tools. JBI critical appraisal tools were created by the JBI and partners and were subsequently accepted by the JBI Scientific Committee after undergoing thorough peer assessment (Joanna Briggs Institute, 2020). Meanwhile, the quality of studies for RCT design was measured using the Critical Appraisal Skills Programme (CASP) through https://casp-uk.net/casp-tools-checklists/ (Table 3, Appendix 2). The CASP RCT checklist was initially developed based on the Journal of the American Medical Association (JAMA) Users' Guides and piloted with medical professionals (Critical Appraisal Skills Programme, 2020). A critical appraisal of the article was conducted by TS and DW. If there was disagreement, NN would involve in reconciling the process based on guidelines from JBI and CASP.

2.7 Risk of bias

The risk of bias in individual studies for quasi-experiment design was determined with the following cutoffs: low risk of bias if 70% of answers scored yes, moderate risk if 50 to 69% of questions scored yes, and high risk of bias if yes scores were below 50% (Goplen et al., 2019). On the results of the risk assessment bias, it was found that of the nine articles reviewed, seven articles had a low risk of bias, two included a moderate risk, and none had a high risk of bias (Table 4). Meanwhile, assessment of the risk of bias in RCT studies was conducted using the Cochrane collaboration tool (Higgins et al., 2011). Of five articles on RCT design, one study used single-blind, two studies did not show clear blindness, and two were non-blind studies (Table 5).

2.8 Data analysis

The authors used synthesis without meta-analysis (SWiM) guidelines in analyzing the data (Campbell et al., 2020). The SWiM guidelines were used to synthesize quantitative data in the form of intervention effects and present it in nine reporting items. Item 1 was grouping the studies into several sections such as authors and year of publication, country, objective, design, hospital setting, intervention model, duration, results, and components of the patient and family-centered care. Items 2-6 were reviewing full-text articles that meet the inclusion criteria to answer the clinical review questions. The article analysis was carried out by reviewing the study design, intervention methods, assessment tools, and intervention effects. The findings are presented in the form of a summary table (item 7), and then the similarities and differences of the outcomes are reported in the form of a narrative (item 8). Furthermore, reporting on the limitations of this study was presented as the final stage of data analysis (item 9).

Table 4. Risk of bias assessment for quasi experiment design

Author	JBI assessment tools										
	Q1[a]	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	% Yes	Interpretation[b]
(Ladak et al., 2013)	Yes	Yes	Unclear	Yes	Yes	No	Yes	Yes	Yes	78%	Low risk of bias
(Uhm & Kim, 2019)	Yes	Yes	Unclear	Yes	Yes	No	Yes	Yes	Yes	78%	Low risk of bias
(Sannino et al., 2016)	Yes	Yes	Unclear	Yes	No	No	Yes	Unclear	Yes	56%	Moderate risk of bias
(Minooei et al., 2016)	Yes	Yes	Unclear	Yes	Yes	No	Yes	Yes	Yes	78%	Low risk of bias
(He et al., 2018)	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	78%	Low risk of bias
(Khan et al., 2018)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	89%	Low risk of bias
(Toivonen et al., 2020)	Yes	No	Unclear	No	Yes	No	Yes	Yes	Yes	56%	Moderate risk of bias
(Peyrovi et al., 2015)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	89%	Low risk of bias
(Rostami et al., 2017)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	89%	Low risk of bias
(Nurhaeni et al., 2018)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	89%	Low risk of bias

Notes:
[a] Q1 – Q9 indicate questions 1 to 9 based on the JBI risk assessment
[b] The risk of bias was ranked as high when the study reached up to 49% of "yes" scores, moderate when the study reached from 50 to 69% of "yes" scores, and low when the study reached more than 70% of "yes" scores

Table 5. Cochrane risk of bias tool for RCT

Cochrane risk-of-bias domain	Randomization process	Allocation concealment	Blinding of participants and researchers	Blinding of outcome assessment	Incomplete outcome	Selective reporting	Other bias
(Heo & Oh, 2019)	+	+	?	-	+	+	+
(Hassanian et al., 2018)	+	+	?	-	+	+	+
(Bastani et al., 2015)	+	+	+	-	+	+	+
(Welch et al., 2013)	+	+	-	-	?	+	+
(Verma et al., 2017)	+	+	-	-	+	+	+

Note: (+) indicates a low risk of bias, (-) indicates a high risk of bias, (?) shows unclear risk of bias

3. Results

3.1 Characteristics of the selected studies

Fifteen articles were included in the review process. The researchers identified 29,780 articles from seven databases, and 28,473 articles were excluded according to limiters (year of publication, type of article, subject area, and open access). Fifty-three articles were selected for review after the remaining 1,307 papers were filtered based on their titles and abstracts. Finally, fifteen articles were included in this review after assessing their eligibility and adding articles from the reference list (Figure 1).

Five of the reviewed articles came from Iran, two from South Korea, and one from Columbia, China, Finland, India, Indonesia, Italy, North America, and Pakistan. All of the articles in this study were conducted in the hospital setting. There were eight studies implemented in the NICU room, two studies in the PICU room, four in the pediatric ward, and one in the pediatric nephrology office (see Table 2). Moreover, this review produced six outcomes related to the quality of care, including pediatric quality of life, length of stay, patient safety, parent satisfaction, parent psychological response, and parent involvement and partnership with staff.

3.2 Participants

The participants in this study were in the age range from 0 to 12 years. The majority (9 of 15 articles) of published studies involved newborn participants and their families in the intervention. The highest number of participants was 3106 children (1574 pre-intervention and 1532 post-interventions), and the number of parents was 2148 (Khan et al., 2018). In comparison, the lowest number of participants was 43 children (21 in the intervention group and 22 in the control group) (Sannino et al., 2016).

3.3 *Characteristics of the intervention and components of the PFCC*

The implementation of the treatment consists of several models including family-centered care (Ladak et al., 2013; Rostami et al., 2017; Bastani et al., 2015; Verma et al., 2017), mother–nurse partnership program (Uhm & Kim, 2019), the newborn individualized developmental care and assessment program (Sannino et al., 2016), the family empowerment model (Minooei et al., 2016; Peyrovi et al., 2015; Nurhaeni et al., 2018), family integrated care (He et al., 2018), family centered communication program (Khan et al., 2018), the close collaboration (Toivonen et al., 2020), and parent participation/participatory care (Heo & Oh, 2019; Hassanian et al., 2018). The duration of the intervention varied in this review, ranging from the longest 18 months (Toivonen et al., 2020) to the shortest 30-45 minutes (Bastani et al., 2015; Nurhaeni et al., 2018). The others have a duration of eight months (Khan et al., 2018), two weeks (Heo & Oh, 2019), two days (Ladak et al., 2013), two hours (Verma et al., 2017), and 30 minutes twice a day (Uhm & Kim, 2019). Each session used a duration from 0.5 to 1 hour (Peyrovi et al., 2015; Hassanian et al., 2018; Minooei et al., 2016) and as many as possible or warranted by the infant's distress (Welch et al., 2013). There was also implementation, starting from the first admission to discharge (Sannino et al., 2016; He et al., 2018). However, there was a study where the duration of the intervention was unclear (Rostami et al., 2017). PFCC components of the intervention include participation (patient and family), partnership, information sharing, collaboration, communication, family empowerment, and decision-making (Table 6).

Table 6. Findings of the quality of care outcomes with PFCC intervention

Quality of care outcomes	Number of studies (f)	Significant effects f (%)	No significant effects f (%)
Pediatric quality of life	5	4 (80)	1 (20)
Length of stay	4	3 (75)	1 (25)
Patient safety	3	1 (33.33)	2 (66.67)
Parent satisfaction	6	6 (100)	-
Parent psychological response	2	2 (100)	-
Parent involvement and partnership with staff	6	6 (100)	-

3.4 *Quality of care outcomes*

Of the 15 articles reviewed, six outcomes were obtained related to the quality of care, i.e., pediatric quality of life, length of stay, patient safety, parent satisfaction, parent psychological response, and parent involvement and partnership with staff (see Table 2). The outcome measurement of this review refers to the quality of care domain issued by WHO (2018), including effectiveness, safety, and people-centredness. Outcome indicators of effectiveness consist of hospital readmission rate, improvement in health status, and death prevention. Meanwhile, outcome indicators of patient safety may include treatment complications or incidence of hospital-acquired infections. Patient satisfaction, activities of daily living, and readiness to recommend the hospital are the outcome indicators of patient-centredness (European Observatory on Health Systems and Policies, 2019).

3.4.1 *Pediatric quality of life*

There were five (33.33%) published studies that reported quality of life as an outcome of PFCC intervention. The study by Minooei et al. (2016) claimed that there were significant differences in the mean score of the children's QoL, including physical and psychosocial domain, and the total QoL score in the intervention group before and after the training ($p<0.05$). In the physical domain, the percentage of normal visual orientation development in infants aged 40 weeks was higher (81%) in the intervention group compared to the control group (52.4%), and neurofunctional assessment at three months had normal scores of 66.6% of children compared to 47.6% of the control group (Sannino et al., 2016). Moreover, there was a significantly reduced respiratory support time, a significant positive weight gain, and a significant increase in breastfeeding for infants in the intervention compared with the control group (He et al., 2018; Verma et al., 2017). However, There was no difference in infants' weight between the intervention and control groups during the parent's participation program in the NICU setting (Heo & Oh, 2019).

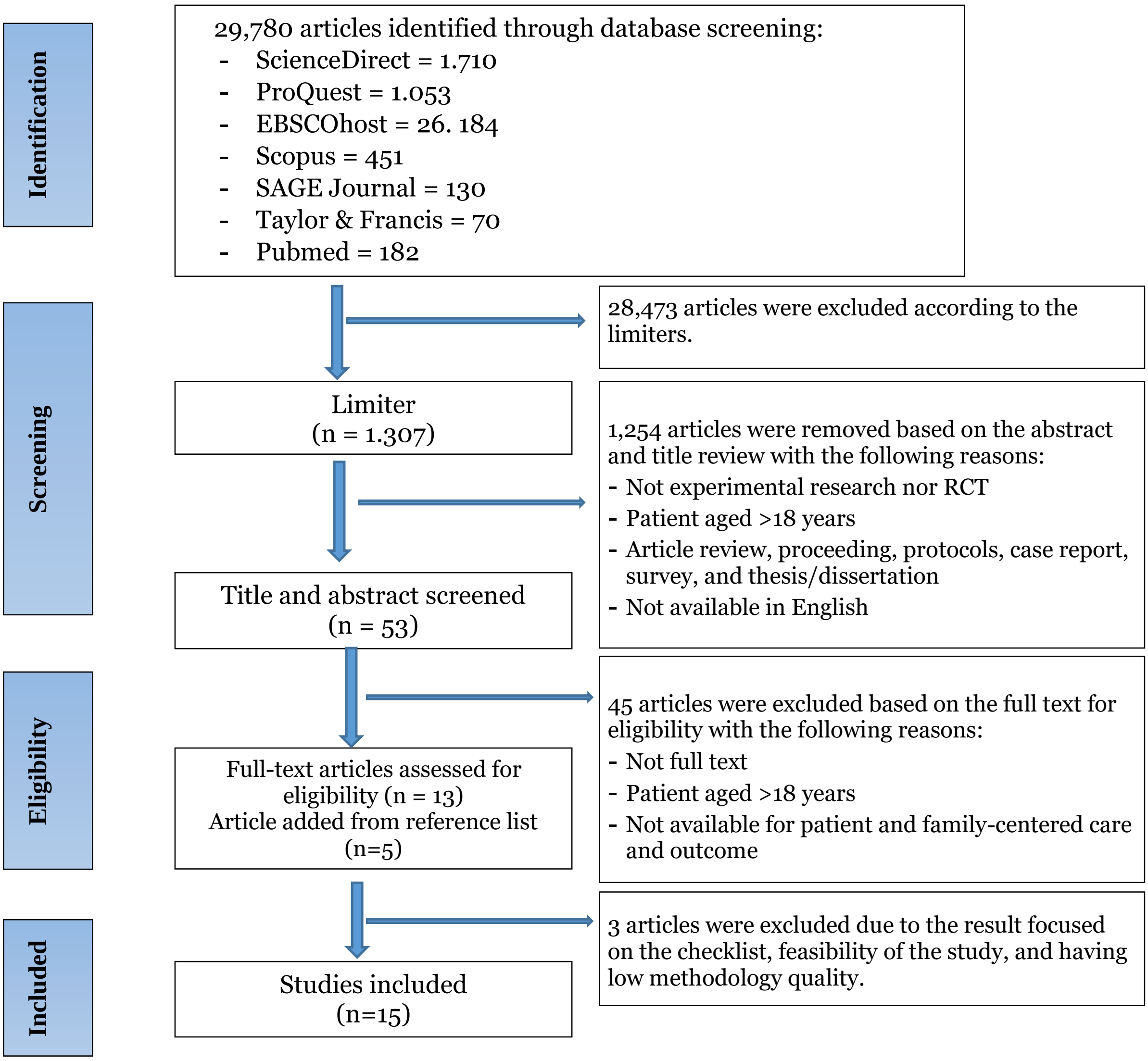

Figure 1. PRISMA flowchart

3.4.2 Length of stay

Of 15 articles reviewed, four studies (26.67%) described length of stay as an outcome of this research. The results of 3 studies revealed that there was a significant decrease in the length of stay in children during hospitalization (Ladak et al., 2013; Nurhaeni et al., 2018; Bastani et al., 2015). Meanwhile, one article confirmed no significant difference between the intervention and control groups (Welch et al., 2013).

3.4.3 Patient safety

There were three (20%) published studies that proclaimed patient safety as a result of this study, including medical complications and nosocomial infection. There was an unchanged rate of medical errors, but harmful errors (preventable adverse events) went down after intervention significantly by $p<0.01$ (Khan et al., 2018). However, the other study stated no significant difference between groups in medical complications (Welch et al., 2013) and nosocomial infection (Verma et al., 2017).

3.4.4 Parent satisfaction

There were six (40%) published studies announced that parental satisfaction increased significantly with $p<0.05$ after PFCC intervention and its components for children hospitalized

(Bastani et al., 2015; Hassanian et al., 2018; Ladak et al., 2013; Nurhaeni et al., 2018; Rostami et al., 2017; Uhm & Kim, 2019).

3.4.5 Parent psychological response

There were two (13.33%) reviewed articles that presented the psychological responses of parents as a result of the intervention in this study. There was a significant decrease in mothers' anxiety with $p<0.001$ and increased parent self-efficacy with $p<0.008$ after the implementation of the partnership model between mothers and nurses (Uhm & Kim, 2019). Furthermore, mothers reported an emotional readiness in preparing to care for their infant on discharge from NICU to home (Peyrovi et al., 2015).

3.4.6 Parent involvement and partnership with staff

There were six (40%) published studies reported that parent involvement and partnership with health professionals as the result of the PFCC intervention. Parents reported that there was an increase in parental involvement (Khan et al., 2018; Ladak et al., 2013; Welch et al., 2013) and a significant raised in parent-staff partnership during child care in hospitals with $p<0.001$ (Heo & Oh, 2019; Uhm & Kim, 2019). This partnership is demonstrated through the support of doctors and nurses in helping them how to care for their infants (Sannino et al., 2016).

4. Discussion

This study aimed to describe and assess the effects of patient and family-centered care on the quality of care in the pediatric patients. There were six outcomes related to the quality of care, including pediatric quality of life, length of stay, patient safety, parent satisfaction, parent psychological response, and parent involvement and partnership with staff. The majority of the components of the PFCC in the articles reviewed used family participation as a research intervention. PFCC in nursing is about treating patients and their families as a partner in care with fostering their participation or collaboration (Seniwati et al., 2023). Family participation in taking care of hospitalized children is a mutual relationship between parents and nurses in providing children's health information and decisions making to improve the quality of care (Vasli & Salsali, 2014). Parental participation can be in the form of involvement in daily care during hospitalization (Melo et al., 2014). Feeding the child or preparing the food tray, changing their clothes, assisting in elimination and sleeping, bathing/wiping with a washcloth, and performing oral care are forms of parental participation in nursing care delivery (Abdelkader et al., 2016).

Improving children's quality of life is an outcome resulting from the PFCC intervention in this review. In the physical domain, PFCC interventions are reported to improve children's clinical outcomes by decreasing oxygen support time (He et al., 2018), promoting better motor, visual, and auditory development (Sannino et al., 2016), and increasing breastfeeding rates pre-discharge (Verma et al., 2017). Quality of life in children is associated with the role of the family in terms of parent-child interactions (Santos et al., 2015). During hospitalization, parents have an important role in child care by providing physical comfort, physiological needs, and psychosocial support and facilitating children to develop abilities in line with the stages of development (Suparto et al., 2020).

Regarding the impact of PFCC on parents, there was a significant increase in the level of parent satisfaction, parent involvement, and parent-staff partnership scores. Parental satisfaction is associated with the attitude of the professional staff, the treatment provided, information, and parental participation during the child's care (Cintra et al., 2022). Nurses as a team in implementing PFCC have a role in involving children and families in the nursing process to improve the quality of care (Palokas et al., 2015; Uhl et al., 2013). A previous study reveals that involving parents in a child's care leads to enhancing their satisfaction in health care (Cimke & Mucuk, 2017). Furthermore, PFCC also has an impact on the psychological response of parents. According to Aljabari et al. (2022), parental involvement in childcare can reduce anxiety in parents. Parental involvement in care will provide opportunities for them to care for their children directly, receive information on their children's health conditions, and improve relationships with care providers (McCabe, 2014).

In addition, the results showed a decrease in length of stay, a negative parent's psychological response, and the incidence of side effects in children during hospitalization. The previous review using an adult sample also stated that the results obtained after the PFCC intervention included decreased length of stay, family satisfaction, and achievement of medical goals (Goldfarb et al., 2017). Likewise, increasing quality of life, reducing the length of the hospital stay, reducing anxiety in family members, and increasing family satisfaction and relationship with healthcare providers an outcomes of PFCC intervention in adult patients (Park et al., 2018). A study revealed that the positive impact of reducing the length of hospital stay in children is related to improved psychological well-being (Segers et al., 2019). Improved psychological conditions such as decreased anxiety, depression, and stress in children are due to the presence of families who accompany children during hospitalization (Adineh et al., 2016). The presence of the family is considered to bring comfort to the patient. It has also been demonstrated that being able to stay in the moment while a family member is in the hospital helps them deal better (McCabe, 2014).

The strength of this review is that the articles were selected using an experimental design, including quasi-experimental and RCT. The results of the risk assessment bias also show that 80% of the quasi-experimental design and about 71% in the RCT included the low risk of bias in the 15 reviewed articles in this study. A study categorized as low risk of bias indicates confidence on the part of the reviewer that the outcome shows the true treatment impact (study results are considered valid). The study informing is capable of judging that no major or minor sources of bias are likely to consequence results (Viswanathan et al., 2012).

5. Implications and limitations

The results of this study have implications for childcare delivery during hospitalization. This review has provided evidence that patient and family-centered care can be an appropriate approach for improving the quality of care for the patient, family, and health care professional. Nurses as a team in health care providers encourage families to be involved in child care, including planning, implementation, and evaluation based on partnerships.

The limitation of this research is generalizations in the research setting and not specific to a particular treatment room. In addition, the types of childhood diseases are also screened in general, and there are no criteria for certain conditions that are included in this review. However, the researcher included all possible interventions within the PFCC components and included RCTs and quasi-experimental designs to analyze the highest quality of evidence. Therefore, recommendations for future research to conduct PFCC reviews by equalizing the research setting and diagnosis of diseases in children.

6. Conclusion

This review conclude that patient and family-centered care intervention is effective in improving the quality of care. The results of this study found that there was an increase in the quality of care in terms of pediatric quality of life, parental satisfaction, parental involvement, and parent-staff partnership scores. Moreover, there was a decrease in the length of stay, the incidence of harmful errors, and a negative parent's psychological response during hospitalization. Family participation is the most component of the PFCC that was applied as an intervention in this study.

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Author contribution

TS was responsible for the conception and design of the study, screening articles, data extraction, data analysis, quality appraisal, drafting the manuscript, and revising the manuscript. While DW and NN were in charge of screening articles, data extraction, and assessing the quality of each included article. All authors have read and approved the manuscript and take full responsibility for its content.

Conflict of interest

The authors have no conflict of interest regarding this article.

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Appendix 1.

Table 2. Data extraction of the selected studies

No	Authors, year of publication, and country	Design	Hospital Setting	Intervention model	Duration	Results	Components of PFCC
1	(Ladak et al., 2013), Pakistan	Quasi-experimental	Pediatric ICU and pediatric cardiac ICU	Family-centered rounds	Two days	There was a significant increase in terms of parental satisfaction, use of simple language, feeling involved in care, making decisions, and precedence in rounds. In addition, Length of stay was significantly reduced after intervention	Family participation
2	(Uhm & Kim, 2019), South Korea	Quasi-experimental	Paediatric cardiac ICU	Mother–nurse partnership programme (MNPP) that delivered in four phases (orientation, information sharing, negotiation, participation)	30 minutes twice a day	In the intervention group, the infant's mother reported significantly higher parental satisfaction, parental self-efficacy, perceived partnership, and lower anxiety compared to the control group.	Partnership between nurse and mothers. Consist of 3 components : information sharing, negotiation, and participation
3	(Sannino et al., 2016), Italy	Quasi experimental	Neonatal intensive care unit	The Newborn Individualized Developmental Care and Assessment Program (NIDCAP)	First admission until discharge NIDCAP assessment was measured from birth to discharge every 10±2 days	Percentage of motor, visual and auditory development of infants to be normal at term increased in infants who received treatment compared to the control group. Maternal support in infant care is higher than the control group	Involving mothers participation in infant health care
4	(Nurhaeni et al., 2018), Indonesia	Quasi experimental	Pediatric wards	Family empowerment model through health education using a flipchart and booklets	Maximum 45 minutes	There was significant differences between the intervention and control groups in empowerment and satisfaction aspects after the intervention. Length of stay indicates a significant difference be- tween the intervention and control groups	Family empowerment
5	(Hassanian et al., 2018), Iran	Clinical trial study	Pediatric wards	Participatory care through skill training to parents	A 1-hour session in the presence of 5 parents per session	All aspects of parental satisfaction including welfare services, medical services, and nursing care in the intervention group was significantly higher than the control group	Parents participation in children's wards

Table 2. Continued

No	Authors, year of publication, and country	Design	Hospital Setting	Intervention model	Duration	Results	Components of PFCC
6	(Khan et al., 2018), North America	Prospective, multicenter before and after intervention study	Pediatric inpatient units/pediatric wards	Family centered communication programme	Nine-month intervention implementation	The overall rate of medical errors was unchanged, but harmful errors (preventable adverse events) decreased by 37.9%. Non-preventable adverse events also decreased. Family engagement and nurse engagement improved on rounds	Communication and Collaboration between health care provider and family Family participation
7	(Minooei et al., 2016), Iran	quasi-experimental	Pediatric nephrologist's office	The family empowerment model through four organized steps; knowledge enhancement, self-efficacy enhancement, self-esteem enhancement through participatory training, and process evaluation	Seven 45-minute sessions	There was a significant difference in the mean score of the children's QoL from their own perspectives in the physical and psychosocial domains and the total QoL score in the intervention group before and after the training	Information sharing through knowledge enhancement, self-efficacy enhancement, Patient and family participation
8	(He et al., 2018), China	A pre-post intervention study	Neonatal intensive care unit	Family integrated care (FIC) through training; hand hygiene, neonatal feeding, neonatal contact, patting on the back of the infant, parents involvement of care	21 hours a day in the first admission until discharge	Compared with control group, the FIC group had significantly increased breastfeeding rates, breastfeeding time, enteral nutrition time, weight gain, and significantly lower respiratory support time. Oxygen Exposure Time decreased but not significant.	Parents participation in infant's care Information sharing
9	(Toivonen et al., 2020), Finland	A mixed-method pre–post intervention study	Neonatal intensive care unit	The Close Collaboration with Parents training program through educational intervention	The training was delivered in 18 months	The quality of family-centered care, as assessed by staff and parents, increased significantly after the intervention. The intervention was able to help staff define and apply elements of family-centered care, such as shared decision making and collaboration between parents and staff.	Shared decision making and collaboration between parents and staff

Table 2. Continued

No	Authors, year of publication, and country	Design	Hospital Setting	Intervention model	Duration	Results	Components of PFCC
10	(Heo & Oh, 2019), South Korea	Randomized controlled trial	Neonatal intensive care unit	Parent participation improvement that consisting of three stages: an individualized interaction stage, a pre-participation stage, and an active participation stage	Two- weeks	Both the mothers and fathers in the intervention group reported significantly higher scores in partnership, and attachment, as well as significantly higher scores within all partnership subscales except communication. However, there was no difference in infants' weight between the intervention and control groups.	Parents participation Partnership nurse-parents
11	(Bastani et al., 2015), Iran	Randomized controlled trial	Neonatal intensive care unit	Family-centered care program which consisted of information about neonatal care, maternal presence, and participation in the care process	30-45 minutes	In the FCC group, the mean score of satisfaction increased after intervention, the mothers were more satisfied with maternal presence in the neonatal intensive care unit, the number of neonatal readmission was less, and the mean duration of hospitalization was lower compared with control groups	Participation Sharing information
12	(Peyrovi et al., 2015), Iran	Quasi-experimental	Neonatal intensive care unit	Empowerment program through training for mothers	Each phase was conducted during a 0.5–1 hour session regularly (consisting of 3 phases)	At discharge time, there was a statistically significant difference in technical readiness and emotional readiness of mothers between control and experimental groups according to mothers' self-report and nurse evaluation	Family empowerment
13	(Welch et al., 2013), Columbia	Randomized controlled trial	Neonatal intensive care unit	Family Nurture Intervention (FNI) through calming session activities that involving mother and infant. Calming session consisting scent cloth exchange, calming touch, and holding	Each session was comprised of as many of the calming procedures as possible or warranted by the infant's distress	There was no significant difference between groups in medical complications. The mean length of stay was not significantly affected by FNI. Mothers were willing to involve in this intervention, and that FNI was compatible with routine care in NICU	Patient and parent engagement

Table 2. Continued

No	Authors, year of publication, and country	Design	Hospital Setting	Intervention model	Duration	Results	Components of PFCC
14	(Rostami et al., 2017), Iran	Quasi-experimental	Pediatric wards	Family-centered care	Not mentioned	In the FCC group, the mean score of satisfaction was increased among the parents after intervention. Besides, there was a significant difference in satisfaction scores between the control and experimental groups, where all parents of the experimental group expressed high satisfaction.	Family participation Collaboration
15	(Verma et al., 2017), India	Randomized controlled trial	Neonatal intensive care unit	Family-centered care through trained for parents using a simple audio-video tool that covered domains of personal hygiene, hand washing, danger signs recognition and feeding of the sick neonate	Training conducted between 10 AM to 12 noon (2 hours)	Incidence of nosocomial episodes of sepsis was not different between groups. Exclusive breastfeeding rates pre-discharge were significantly higher in intervention group compared with control group.	Parents participation Sharing information

Appendix 2.

Table 3. Critical appraisal for RCT with CASP

No	Critical appraisal for RCT (Critical Appraisal Skills Programme, 2020)	(Heo & Oh, 2019)	(Hassanian et al., 2018)	(Bastani et al., 2015)	(Welch et al., 2013)	(Verma et al., 2017)
1	Did the study address a clearly focused research question?	Yes	Yes	Yes	Yes	Yes
2	Was the assignment of participants to interventions randomised?	Yes	Yes	Yes	Yes	Yes
3	Were all participants who entered the study accounted for at its conclusion?	Yes	Yes	Yes	Yes	Yes
4	Were the participants 'blind' to intervention they were given?	Can't tell	Can't tell	Yes	No	No
	Were the investigators 'blind' to the intervention they were giving to participants?	No	No	No	No	No
	Were the people assessing/analysing outcome/s 'blinded'?	No	No	No	No	No
5	Were the study groups similar at the start of the randomised controlled trial?	Yes	Yes	Yes	Yes	Yes
6	Apart from the experimental intervention, did each study group receive the same level of care (that is, were they treated equally)?	Yes	Yes	Yes	Yes	Yes
7	Were the effects of intervention reported comprehensively?	Yes	Yes	Yes	Yes	Yes
8	Was the precision of the estimate of the intervention or treatment effect reported?	No	No	No	Yes	Yes
9	Do the benefits of the experimental intervention outweigh the harms and costs?	Yes	Yes	Yes	Yes	Yes
10	Can the results be applied to your local population/in your context?	Yes	Yes	Yes	Yes	Yes
11	Would the experimental intervention provide greater value to the people in your care than any of the existing interventions?	Yes	Yes	Yes	Can't tell	Yes

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ORIGINAL RESEARCH

Postpartum Depression and Its Contributing Factors among Mothers during the COVID-19 Pandemic in North Jakarta, Indonesia

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Abstract

Background: Postpartum depression is a common psychological problem that occurs after birth. It has become especially prevalent in the era of the COVID-19 pandemic. Several factors contribute to postpartum depression. However, a limited study evaluated factors contributing postpartum depression among mothers during the COVID-19 pandemic, particularly in Indonesia.
Purpose: This study aimed to explore postpartum depression among mothers and its contributing factors during the COVID-19 pandemic.
Methods: This study adopted a cross-sectional design. A total of 110 postpartum mothers were recruited by accidental sampling with the following inclusion criteria: mothers between one month and one year after birth, married, a singleton birth and the baby alive, and the mother is healthy with no complications. The Edinburgh Postnatal Depression Scale was used to measure postpartum depression. Descriptive statistics, t-test, Fisher exact test, one-way ANOVA, and logistic regression were performed to analyze the data.
Results: The prevalence of postpartum depression during the pandemic period was 31.82%. Factors contributing to postpartum depression were the mother's age (p=0.011), childcare stress (p=0.001), stressful life events (p=0.003), and pregnancy status (p=0.0001). A logistic regression showed that pregnant status (Unplanned/unwanted pregnancy) was the most contributor to postpartum depression (β=0.377, t=5.138, p=0.0001).
Conclusion: This study identified a high rate of postpartum depression with related factors, including mother's age, childcare stress, life stress, and unplanned/ unwanted pregnancy. Screening for postpartum depression is required to ensure early detection among postpartum mothers.

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1. Introduction

The postpartum period is a time of adaptation to a non-pregnant state after childbirth, during which mothers experience physical, emotional, and mental changes (Sylven et al., 2017). Postpartum depression (PPD) is one of the mental health effects that mothers can experience after giving birth. As a mood disorder, mothers can experience PPD for up to one year after delivery. The symptoms of PPD include anxiety, irritability, difficulty sleeping, no appetite, and difficulty paying attention to the baby (O'Hara & McCabe, 2013).

PPD can occur during the first year after birth (American Psychiatric Association, 2013) and will negatively impact the mother, husband, family, and baby. When experiencing PPD, mothers tend to have difficulty thinking clearly when making decisions. Furthermore, they may have appetite disorders, persistent low mood, and a feeling of sadness, while also perceiving that they are not good mothers to their babies (Sulfianti et al., 2021). Over the longer term, the potential negative impacts of PPD include a deterioration in the mother–infant relationship, delays in infant development, and the effect on child behavior (Potter et al., 2019).

Studies conducted before the COVID-19 pandemic showed through meta-analysis that the rate of prevalence of PPD stood at 17% among healthy postpartum women (Wang et al., 2021), with the highest incidence in Middle Eastern and Asia countries (26%) and the lowest incidence in European countries (8%) (Shorey et al., 2018). Meanwhile, the prevalence of PPD in Indonesia stood at 11.76%–18.37% (Nurbaeti et al., 2019; Wang et al., 2021). During the COVID-19 pandemic, certain countries recorded a higher prevalence of PPD in the range of 31.82%–44.44%, for example, Myanmar, Mexico, Italy, Turkey, and the UK (Chen et al., 2022).

After the World Health Organization (WHO) declared the outbreak of COVID-19 a pandemic in January 2020, including in Indonesia in March 2020, the psychological impact on the community led to many responses, including anxiety, depression, and post-traumatic stress (WHO, 2020). Ongoing psychological impacts during pregnancy and childbirth can result in mothers experiencing psychological disorders during their postpartum period. However, amid the COVID-19 pandemic, the psychological well-being of women during the postpartum period was neglected and often overlooked (Chen et al., 2022).

Many previous studies worldwide have documented the contributing factors to PPD before the COVID-19 pandemic, such as depression during pregnancy, stress in childcare, stress in live events, social support, anxiety during pregnancy, marital satisfaction, history of previous depression, infant temperament, maternity blues, and self-esteem (Franck et al., 2016; O'Hara & Mc Cabe, 2013), as well as socioeconomic status (Chang et al., 2016), marital status, and unplanned/unwanted pregnancy (Falah-Hassani et al., 2016; O'Hara & Mc Cabe, 2013; Smorti et al., 2019). The COVID-19 pandemic has influenced women's mental health, particularly in vulnerable groups such as mothers after birth (WHO, 2020). As a result, the prevalence of PPD increases higher than in non-pandemic era. Studies on PPD were conducted in various countries during the COVID-19 pandemic (Safi-Keykaleh et al., 2022; Shuman et al., 2022; Usmani et al., 2021). Meanwhile in Indonesia, Solikhah et al. (2022) found that the determinant factor of PPD during the COVID-19 was first-time mothers and attitudes. At the same time, other factors have not been documented. Therefore, it is important to develop the knowledge of PPD and its contributing factors. Accordingly, this study was conducted to explore postpartum depression among mothers and its contributing factors, including childcare stress, life stress, social support, marital satisfaction, and pregnancy status.

2. Methods

2.1 Research design

This study employed a cross-sectional research design. This research design was adopted to measure the independent and dependent variables simultaneously at the same time.

2.2 Setting and samples

The study was conducted from April to May 2022. The study setting was the maternal and child clinic of the public health center in North Jakarta, Indonesia, as an entry point to find the proposed participants. The accidental sampling technique was used to recruit the participants following the inclusion criteria: mothers with a postpartum period of one month to one year after delivery, a live baby, healthy and with no complications, and married. Meanwhile, twin babies, mothers with preterm labor, and mothers who had been diagnosed with mental problems were excluded from the study. The number of samples was 110 postpartum mothers determined using the G-power analysis.

2.3 Measurement and data collection

Six questionnaires were used in this study. The demographic data consisted of respondents' characteristics and the babies, including the mother's education, mother's age, working status, family income, previous exposure to COVID-19, baby's gender, number of children, and pregnancy status. Other instruments were the Edinburgh Postnatal Depression Scale (EPDS) questionnaire developed by Cox et al. (1987) to measure postpartum depression, Childcare Stress Inventory (CSI) questionnaire developed by Cutrona (1983) to measure childcare stress, the modified Life Events Questionnaire (LEQ) developed by Norbeck (1984) to measure life stress, Postpartum Support Questionnaire (PSQ) developed by Logsdon et al., (1994) to assess respondents' perceptions of the support received during the postpartum period, and the Dyadic Adjustment Scale (DAS) questionnaire developed by Spanier (1976) to measure marital satisfaction. All instruments have been translated into Bahasa Indonesia in a previous study (Nurbaeti et al., 2018).

The EPDS consists of 10 question items with a score of 0 to 3 on each item; it thus produces a total score in the range of 0–30, where a score of 12 or more indicates PPD (Bhusal et al., 2016; Nurbaeti et al., 2019; Sylven et al., 2017). In addition, the instrument's validity and reliability have already been proven; the validity test results in the range of 0.333-0.694, and the reliability test produced a Cronbach's alpha value of 0.80 (Nurbaeti et al., 2019).

The CSI consists of 20 question items, each of which has a score of 0 (not disappointing) to 100 (disappointing). This instrument produces scores in the range of 0-2000; the cut-off score was 342. A score of 342 and more indicated experience of stress in childcare. A validity test result in the range of 0.155-0.488 and a reliability test result of 0.74 (Nurbaeti et al., 2019).

The original LEQ contained 10 question items, and Nurbaeti et al. (2018) added five items to make it suitable for use with postpartum mothers. This modified LEQ thus contains 15 question items with scores ranging from 0 (no effect) to 3 (excellent effect). It gives a total score in the range of 0-45, where a total score of more than 14 shows that life stress occurred. The validity test showed a value in the range of 0.267-0.611, while the reliability test revealed a Cronbach's alpha value of 0.83 (Nurbaeti et., 2019).

PSQ comprises 34 question items, with each item being scored from 0 (not helpful) to 7 (much help). The total scores range from 0 to 238, with a cut-off score of 191 indicating more support received. The result of the validity test was in the range of 0.155-0.448, and the reliability test result was 0.98 (Nurbaeti et al., 2019).

The DAS consists of 32 questions. The total score is in the range of 0-151, with a cut-off score of <100 indicating dissatisfaction in the marital relationship. The validity test is in the range of 0.157-0.629, and the reliability test result showed a Cronbach's alpha value of 0.73 (Nurbaeti et al., 2019).

The data were collected through home visits. Candidates of the participants who met the inclusion criteria from the maternal and child clinic in the public health center were persuaded to participate in the study. If they concurred to participate, the researcher requested their phone number and home address and made an appointment to visit. The researcher then visited the participants' homes as agreed. After each participant had provided their consent, they filled out the questionnaire, which took around 20 minutes. The researcher and participant did a health protocol such as hand wash before and after contact, wearing a face mask, and keeping a distance during data collection.

2.4 Data analysis

Univariate statistics were used to describe the respondents' characteristics and the variables studied. Bivariate analysis was performed using t-test to analyze the relationship between mother's age and the number of children with PPD and Fisher exact test was used to analyze the relationship between working status, COVID-19 survivor, baby gender, childcare stress, life stress, social support, marital satisfaction, and unplanned/unwanted pregnancy with PPD. Furthermore, one-way ANOVA was performed to analyze the relationship of mothers' education and family income with PPD. The ENTER logistic regression method was performed to analyze the factors that contribute to PPD.

2.5 Ethical considerations

The ethical approval of this study was obtained from the Health Research Ethics Committee of the Faculty of Health Sciences, UIN Syarif Hidayatullah Jakarta with a reference number of UN.01/F.10/KP.01.1/KE.SP/04.08.023/2022. The principle of anonymity in the data collection was considered. It relates to the questions posed to respondents about names to prevent double data. Prior to the recruitment of participants, the researcher explained the purpose and benefits of the research to the candidate respondents. They signed an informed consent letter for their participation.

3. Results

3.1 Characteristics of respondents

Table 1 contains a brief summary of the respondents' characteristics and the babies. The youngest mothers were 20 years old, and the oldest were 45 years old. The majority graduated from senior high school (60.90%) and were housewives (69.10%). Furthermore, 81.82% have an average monthly family income of IDR 5.000.000 (US$ 400) or less and 20.90% had a history of exposure to COVID-19. The analysis found that the mother's age contributed to PPD while the other characteristics did not.

Table 1. Characteristics of respondents (n=110)

Variable	n (%)	Postpartum Depression	No Postpartum Depression	p-value
Mothers' education				
Elementary School	7 (6.37%)	2	5	0.918
Junior High School	7 (6.37%)	2	5	
Senior High School	67 (60.90%)	23	44	
University	29 (26.36%)	8	21	
Mothers' age (years)	Min – Max = 20 - 45			
	Mean = 28.56 (SD= 5.745)	Mean= 26.20	Mean=29.67	0.011
	Median = 27.00			
Working Status				
Working	34 (30.90%)	9	25	0.559
Housewives	76 (69.10%)	26	50	
Family Income in IDR (equal US$)				
< 2.500.000 (200)	46 (41.82%)	16	30	0.735
2.500.000-5.000.000 (200-400)	44 (40.00%)	14	30	
> 5.000.000 (>400)	20 (18.18%)	5	15	
COVID-19 exposure				
Yes	23 (20.90)	5	18	0.360
No	87 (79.10%)	30	57	
Baby's gender				
Boy	55 (50.00%)	17	38	1.000
Girl	55 (50.00%)	18	37	
Number of Children	Min-Max = 1-5			0.324
	Mean = 1.78 (SD=0.971)	Mean=1.60	Mean=2.35	
	Median = 1.00			

Note: The t-test was used to analyze mother's age and the number of children with PPD; the Fisher exact test was sued to analyze the relationship between working status, COVID-19 survivor, baby gender; one-way ANOVA was used to analyze mothers' education and family income with PPD.

3.2 The prevalence of postpartum depression

As shown in Table 2, the prevalence of PPD among mothers during the COVID-19 pandemic era in this study was 31.82%.

Table 2. The prevalence of postpartum depression among mothers during the COVID-19 pandemic

Postpartum Depression		No Postpartum Depression	
n	%	n	%
35	31.82	75	68.18

3.3 Contributing factors of postpartum depression: childcare stress, life stress, social support, marital satisfaction, and unplanned/unwanted pregnancy

Table 3 presents the bivariate analysis using Chi-square analysis to test the relationship between the various contributing factors and PPD. The results show that childcare stress (*p*=0.001), stressful life events (*p=0.003*), and planned/wanted pregnancy (0.0001) have a significant contribution to PPD, while social support (*p*=1.000) and marital satisfaction (*p*=1.000) have not contributed to PPD.

To complete the analysis, the researcher performed a logistic regression using the ENTER method. All the significant variables were included in the analysis. It showed that the mother's age, childcare stress, life stress, and pregnancy status could explain 49% of the variance in PPD (R^2=0.490; F=25.190; *p*=0.0001). Pregnancy status explained the most variance (β=0.377, t=5.138, *p*=0.0001) followed by life stress (β=0.304, t=3.920, *p*=0.0001), mother's age (β=-0.223, t=-3.123, *p*=0.002), and childcare stress (β=0.221, t=2.776, *p*=0.007) (Table 4).

Table 3. Contributing factors to PPD: Child care stress, life stress, social support, marital satisfaction and unplanned/unwanted pregnancy and postpartum depression (n=110)

Variable	Postpartum Depression		X^2	*p*-value
	No	Yes		
Childcare Stress				
No	46 (41.81%)	9 (8.19%)	10.728	0.001
Yes	29 (26.37%)	26 (23.63%)		
Life Stress				
No	41 (37.27%)	8 (7.27%)	8.530	0.003
Yes	34 (30.90%)	27 (24.55%)		
Social Support				
High	36 (32.73%)	23 (20.91%)	2.341	0.126
Low	39 (35.45%)	12 (10.91%)		
Marital Satisfaction				
Yes	66 (60.00%)	31 (28.18%)	0.000	1.000
No	9 (8.18%)	4 (3.64%)		
Pregnant Status				
Planned/Wanted	74 (67.27%)	22 (20.00%)	24.420	0.0001
Unplanned/Unwanted	1 (0.91%)	13 (11.82%)		

Note: Analysis was conducted by using the Fisher exact test

Table 4. Contribution of mother's age, childcare stress, life stress, and pregnancy status to PPD during the COVID-19 pandemic in North Jakarta, Indonesia (n=110)

	Unstandardized Coefficients		Standardized Coefficients	t	*p*	95.0% CI for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	5.044	2.308		2.185	0.031	0.467	9.621
Mothers age	-0.214	0.068	-0.223	-3.123	0.002	-0.350	-0.078
Childcare stress	0.004	0.001	0.221	2.776	0.007	0.001	0.006
Life Stress	0.152	0.039	0.304	3.920	0.0001	0.075	0.229
Pregnancy Status	6.198	1.206	0.377	5.138	0.0001	3.807	8.590

R=0.700; R^2 = 0.490; F= 25.190; *p*= 0.0001

4. Discussion

This study aimed to determine PPD among mothers and its contributing factors, including childcare stress, life stress, social support, marital satisfaction, and unplanned/unwanted pregnancy. In this study, the prevalence of PPD among mothers during the COVID-19 pandemic in North Jakarta, Indonesia, using a cut-off score of 12, was 31.82%. This rate was much higher than those found in studies conducted before the pandemic. For instance, Nurbaeti et al. (2019) found that 19.88% of postpartum mothers in South Jakarta, Indonesia, experienced depressive symptoms following childbirth. More recently, a study by Solikhah et al. (2022) found that 57% of mothers experienced PPD in Malang, East Java, Indonesia. In the general population, Sarfika et al. (2021) found higher about 71.70% of the population in Indonesia with depressive symptomatology during the pandemic. This study's finding is similar to that of Chen et al. (2022) who concluded that the prevalence of PPD was 34%. McFarland et al. (2021) reported that women in New Jersey, USA, who gave birth in March 2020, at the beginning of the COVID-19 pandemic, were more likely to have higher levels of depressive symptoms than women who gave birth before the COVID-19 pandemic. Hummel et al. (2022) found that 32.9% of Kenyan women tended to experience PPD symptoms during the COVID-19 pandemic. These research findings show that the COVID-19 pandemic could have had a detrimental effect on maternal mental well-being among women after childbirth (Chen et al., 2021).

This study showed that unwanted or unplanned pregnancy was the strongest contributor to PPD with OR 95%; CI 3.807–8.590. This explains why mothers with unplanned or unwanted pregnancies tended to experience PPD 3-8 times more often than mothers who planned or wanted to become pregnant. An unwanted or unplanned pregnancy can considerably alter the lives of women and their families as well as their socio and economic condition. The present study amplified previous studies (Abbasi et al., 2013; Brito et al., 2015; Kettunen et al., 2016; Surkan et al., 2018). Surkan et al. (2018), in a study in Bangladesh, found that mothers with unwanted pregnancies tended to be at higher risk of experiencing depressive symptoms compared with mothers who wanted their pregnancies. Women who perceived that their husbands did not want the pregnancy were also at higher risk of prenatal and postnatal depressive symptoms. Furthermore, Brito et al. (2015) reported a frequency of unwanted pregnancy of 60.2%; among those women, 25.9% experienced PPD symptoms. Therefore, women who perceived their pregnancy was unwanted had higher symptoms of PPD (Brito et al., 2015). Similarly, Abbasi et al. (2013) identified a higher prevalence of PPD among first-time mothers if they perceived their pregnancy was unwanted compared with wanted pregnancies; however, unwanted pregnancy was not significantly associated with PPD. Wanted pregnancy relates to women's readiness to become a mother and assume the role of motherhood.

The COVID-19 pandemic increased the tension and anxiety for many people, particularly in vulnerable communities such as postpartum mothers. Communities were forced to adapt in the face of the pandemic; for example, maternal health facilities were closed at the start of the outbreak, regional quarantines were imposed, and lockdowns and social distancing became part of people's lives (Bhattacharjee & Ghosh, 2022). In our study, life stress was found to significantly contribute to PPD. This finding is consistent with those from previous studies conducted before the COVID-19 pandemic. Qobadi et al. (2016) reported depressive symptomatology among postpartum women associated with life stress. Women who notified more scores of life stress experienced a much higher level of PPD symptoms compared to those who had lower levels of life stress. Such events included trauma-related stress, financial stress, and emotional stress. Similarly, Al Nasr et al. (2020) and Nurbaeti et al. (2019) identified that stressful life events were the strongest contributor to PPD. During the COVID-19 pandemic, Cameron et al. (2020), in a study conducted in Canada, found a significant correlation between stress and PPD. They reported a greater stress score during the previous month, of 1.03-2.99, thus indicating that time can predict maternal depression. Salm Ward et al. (2017), despite conducting their study before the COVID-19 pandemic, also identified that life stress, such as dissent with a partner, hardship in bill payables, and separation or divorce, was relevant as significant predictors of an increased likelihood of PPD. Experiencing high stress in any domain has been found to significantly predict PPD, followed by a combination of high relational and financial stress. Furthermore, Kettunen et al. (2016) reported that negative life events such as the death of a loved one, sickness (self or child/family), marital relationship problems, and socioeconomic problems also contributed to PPD.

Our study showed that childcare stress made a significant contribution to PPD. During the postpartum period, mothers experience physical, emotional, and psychological changes as part of the adjustment to a non-pregnant state. In Indonesian culture, a woman must also take care of her babies. During the COVID-19 pandemic, when mobility was restricted, some women's inability to involve their extended family in care for their newborns posed a challenge. Therefore, readiness to become a parent can lead to stress, which includes taking care of the baby. Mothers also faced the added fear of either themselves or their babies becoming infected with COVID-19. The present study aligns with previous studies (Kettunen et al., 2016; Kim et al., 2019; Nurbaeti et al., 2018 and 2019) on aspects of childcare stress. Kettunen et al. (2016), for example, found that a deterioration in the relationship between infant and mother tended to increase the risk of PPD by 1–2 times. In Korea, postpartum period women who received attended Sanhujori care facilities felt comfortable and could be rested and relaxed. This type of intervention during the postpartum period could therefore reduce depressive symptoms. After they came back to their returning homes, they became worried about taking care of their babies (Kim et al., 2019).

According to our study, the mother's age significantly contributed to PPD, with a negative beta score. As such, the youngest women had higher depressive symptom scores than the older women, thus indicating that maternal age is linked to women's maturity to deal with the role of motherhood. In this regard, this study was consistent with other studies conducted during the COVID-19 pandemic. Suárez-Rico et al. (2021) reported that the mother's age was a significant predictor of PPD. In a literature review, Chen et al. (2022) found that respondents' socio-demographic characteristics, marital status, woman's age, and employment status were significantly correlated with PPD. Iwata et al. (2016) identified that younger and first-time mothers tended to experience depressive symptoms during the postpartum period compared to older first-time mothers or more than one child. Moreover, maturity, stability of the marriage relationship, and experience in taking care of the baby were the possible factors that older first-time mothers and mothers who have more than one child are more likely to have less depressive symptoms (Iwata et al., 2016).

Interestingly, marital satisfaction and social support did not significantly contribute to PPD, which was contrary to the findings of previous studies (Al Nasr et al., 2020; Chen et al., 2022; Nurbaeti et al., 2018; Nurbaeti et al., 2019). This may reflect the fact that during the COVID-19 pandemic, communities received support from the government in the form of social service programs and direct cash assistance. Restrictions on movement may also have led to increased levels of domestic help for postpartum women from husbands or relatives.

5. Implications and limitations

This study has implications for nursing practices and health policies concerning the prevention of PPD among postpartum mothers and the preservation of their mental health. Early detection is needed to prevent PPD, for instance, conducting socialization with all postpartum mothers on the independent use of postpartum depression screening applications. Health workers can also provide maximum support regarding the prevention and management of PPD. This would assist mothers in knowing when to seek help for further treatment. In addition, by learning about the factors that contribute to PPD, nurses and other health workers can provide support in the form of knowledge about physical and psychological changes during the postpartum period, psychological adaptation of postpartum, how to take care of the baby, breastfeeding, and the things that postpartum mothers need, especially in the context of the COVID-19 pandemic.

This study, nevertheless, has some limitations. First, while it adopted a cross-sectional design, the independent and dependent variables were explored only once with no follow-up. Second, the use of accidental sampling in this study to identify participants who met the criteria did not fully represent Indonesian mothers in Jakarta.

6. Conclusion

In conclusion, our findings revealed a greater prevalence of PPD during the COVID-19 pandemic than before it began. Factors including the mother's age, childcare stress, life stress, and unplanned/unwanted pregnancy were identified as contributors to PPD. Collaboration between maternity nurses, community nurses, and midwives is needed to promote knowledge about PPD through offline and online media. Collaboration with medical doctors and psychologists may also be required in terms of helping mothers deal with mental health problems through counseling or therapeutic regimens. There is a need to develop nursing interventions among antenatal and postpartum mothers to prevent PPD. Further research is also needed to explore the impact of PPD on the mother–child relationship and couples' relationships in a longitudinal study.

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Author contribution

All authors have contributed to this study, including the concept, design, data collection, management, and analysis, and the drafting and writing up of the manuscript.

Conflict of interest

No conflict of interest is stated among the authors.

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REVIEW

The Prevalence of Nurses' Emotional Exhaustion during COVID-19 Pandemic: A Systematic Review and Meta-Analysis

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Abstract

Background: Nurses in many countries face a high prevalence of psychological pressure while caring for COVID-19 patients. Several determinants of emotional exhaustion leading to occupational burnout risk were documented. However, a recent review examining nurses' emotional exhaustion during the COVID-19 pandemic is lacking in nursing literature.

Purpose: This review aimed to examine the prevalence of nurses' emotional exhaustion during the COVID-19 pandemic. This review also describes the organizational contributing factors to nurses' emotional exhaustion.

Methods: A systematic review and meta-analysis of the literature following the PRISMA guidelines was conducted in March 2022. Four databases, including PubMed, ProQuest Platform, Wiley, and Google Scholar, were searched from 1 January 2020 to 28 February 2022. The prevalence of nurses' emotional exhaustion (EE) was pooled using random effect meta-analyses. The quality appraisal of the studies was done using the Joanna Briggs Institute (JBI) checklist. Data analysis utilized a random effect model to evaluate the pooled effects of the studies due to the high heterogeneity between results.

Results: Nine studies were included with a total number of 16,810 subjects surveyed, of whom, 8,150 (48.50%) met the criteria for emotional exhaustion. Based on the standard effect model, the pooled estimate for EE prevalence was 48.9% (95% CI:48.1% to 49.6%). Several organizational factors contributing to nurses' emotional exhaustion included working in critical care units or isolation wards, longer working hours in COVID-19 quarantine units, night shifts, working with confirmed or suspected co-workers, monthly salary income, and inadequate hospital resources.

Conclusion: This review found that nurses were suffering from high to moderate emotional exhaustion levels during the COVID-19 pandemic. Furthermore, several organizational factors influence this emotional exhaustion. These findings highlight the necessity for urgent interventions to decrease psychological impacts on frontline nurses.

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1. Introduction

Globally, as of March 2022, over 462 million confirmed cases of the Coronavirus Disease (COVID-19) have expanded into more than 60 countries (Al-Rabiaah et al., 2020; WHO, 2022). Based on the global data reported to the World Health Organization (WHO), the pandemic has caused 6,056,725 deaths among the global population. Moreover, WHO estimated up to 180,000 deaths occurred between January 2020 and May 2021 among healthcare professionals during the pandemic (WHO, 2021).

Healthcare professionals are at higher risk of being infected by the COVID-19 virus than the general population (Chen et al., 2020). Unfortunately, a meta-analysis conducted during the first wave of the pandemic found that 25.3% of deaths from COVID-19 among health care professionals were nurses (Bandyopadhyay et al., 2020). Based on the International Council of Nurses, an estimated 1,500 deaths among nurses were reported due to COVID-19 in 44 countries as of October 2020 (International Council of Nurses, 2020). However, the burden of accurate mortality numbers is likely under-reports worldwide (WHO, 2021).

Nurses are frontline health care professionals who come close to COVID-19 patients and undertake most direct tasks with inadequate protection from contamination (Kang et al., 2020; Liu et al., 2020; Zhan et al., 2020). This fact threatens nurses' safety and their family members, putting them under extreme and constant physical and psychological pressure (Bao et al., 2020; Hu et al., 2020; Joo & Liu, 2021). Under these severe psychological and physical threats, nurses could experience burnout, emotional exhaustion, stress, fear, depression, and social prejudice, and then diminish professional productivity, errors in clinical care, and lower patient care outcomes (Al Maqbali et al., 2021; Pappa et al., 2020).

The current data report the startling levels of EE prevalence among nurses in various countries. Several studies conducted during the COVID-19 pandemic confirmed that nurses suffered from moderate to high levels of EE (Clinton et al., 2022; Hu et al., 2020; Salari et al., 2020). According to the results of Chen et al. (2020), moderate degrees of EE were reported by 6,051 Chinese nurses, 48% of the total sample. Similarly, Wan et al. (2022) presented moderate to high degrees of EE among 200 Chinese nurses, 22.6% of the total sample. In Iran, Kakemam et al. (2021) revealed that 703 nurses were suffering from moderate to high degrees of EE, which is 48.3% of the total sample. Similar EE levels were reported by nurses from the United States, displaying that 61% of nurses experienced EE during the COVID-19 pandemic (Sagherian et al., 2020). These levels are like that found in Bellanti et al. (2021), who confirmed that 76.5% of Italian nurses had moderate to high scores in the EE dimension. Jose et al. (2020) also reported that 54.16% of nurses working in the emergency department experienced severe EE, and 37% reported a moderate level in India. The international literature has shown a range of moderate to high EE levels among nurses, which call for further analysis and improvement strategies for the future development of nurses' work, patients' quality of care, and organizational outcomes (Galanis et al., 2021).

The consequences of EE can be examined from personal and organizational aspects. For instance, EE not only impacts nurses' health and well-being but also leads to organizational malfunctioning (Zhang et al., 2020). It may negatively affect patient care, nurse dissatisfaction, lack of quality sustainability in health care systems, reduced work commitment, and increased nurse turnover (Aiken et al., 2012; Lee et al., 2016). Recognizing those factors and preventing EE that leading to occupational burnout can play a crucial role in improving nurses' performance and well-being, thus enhancing the quality of healthcare services provided at hospitals (Ahola et al., 2017). The emotional exhaustion dimension among nurses was reported to be higher and most affected in most of the previous studies during COVID-19, while the other two dimensions of burnout presented with lower scores (Hu et al., 2020; Kakemam et al., 2021; Sagherian et al., 2020; Zhang et al., 2020). In addition, as far as our knowledge and search, there is no meta-analysis or systematic review that examined nurses' EE prevalence during the COVID-19 pandemic. Therefore, it is vital to estimate the nurses' EE during the crisis of COVID-19. Such knowledge can be devised to protect and preserve frontline nurses and to increase future attention and support from organizations and policymakers.

This study aims to analyze the prevalence of nurses' emotional exhaustion and describe the influence of organizational factors during the COVID-19 pandemic. The theoretical framework of this review is based on the Maslach Burnout theory. Maslach's theory describes burnout as an occupationally triggered condition, including emotional exhaustion, depersonalization, and decreased one's feeling of personal accomplishment (Dall'Ora et al., 2020). EE is one of the three dimensions of burnout syndrome resulting from accumulating prolonged stressors in one's working conditions (Clinton et al., 2022). Therefore, analyzing EE levels with antecedents from institutional factors and presenting a systematic review may help the global nurse community better understand nurse burnout during the COVID-19 pandemic.

2. Methods

2.1 Research design

A systematic review and meta-analysis of the literature was performed following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

2.2 Search method

The search was conducted in March 2022. The search terms were (("Nurs* Or "Nursing") AND ("Emotional exhaustion" Or "Burnout") AND ("Coronavirus" Or "COVID-19")) in English.

The authors conferred the following scientific databases: PubMed, ProQuest Platform, Wiley, and Google Scholar from 1 January 2020 to 28 February 2022, and removed duplicates.

2.3 Inclusion and exclusion criteria

The following inclusion criteria were considered for the search: (a) quantitative studies; (b) studies that assessed nurses' occupational burnout; (c) studies that were conducted during the COVID-19 period; (d) sample of nurses provided direct care to COVID-19 patients; (e) English language papers; (f) studies utilized the Maslach Burnout Inventory (MBI) involved in the meta-analysis.

The authors excluded studies that examined the entire healthcare professional and did not focus on nurses. Even preprints, mixed-methods, qualitative studies, protocols, editorials, book chapters, non-published papers, the abstracts of the conferences, and letters to editors, sample of nursing students or midwives, studies without adequate statistical information to perform meta-analysis estimations, and final studies (dissertations and thesis) were also excluded.

2.4 Screening of articles

The search strategy consisted of four steps according to the PRISMA guidelines of identification, screening, eligibility, and inclusion (Moher et al., 2015). Initially, the electronic databases searches identified 1,152 records, and 15 additional records were identified through an inverse search from the reference lists of the included studies or studies located from the included systematic reviews and a forward search of studies cited from the included studies.

Then, after removing the duplicates (n=469), screening was performed for each title and abstract of the document (n=698), followed by filtering the full texts to be included in the systematic review. In this phase, 638 records were excluded from the initial title and abstract screening. Then, 60 full-text documents were screened.

After that, another 51 records were excluded for not meeting the inclusion criteria as they utilized other scales to measure nurses' burnout and not the MBI-Emotional Exhaustion subscale (n=25); studies used MBI but in non-English versions (n=3); studies did not measure nurses' EE during COVID-19 period (n=9) but was published in COVID-19 period; studies with samples of nurses did not provide direct care to COVID-19 patients (n=3); unable to reach full text of studies (n=4); studies with a mixed method design (n=2); a study used cohort design (n=1); a study with sample of nurses and midwives (n=1); a study with sample of nurses and nursing students (n=1); and preprint studies (n=2). Finally, the documents were reduced to a final sample of nine studies utilized and measured the EE subscale of the MBI assessment tool (see Figure 1).

2.5 Data extraction

A structured form was used to extract data from each study. The following data were considered for extraction: (a) Authors; (b) year of publication; (c) country of the study; (d) sample size; (e) sampling method; (f) study design; (g) response rate; (h) data collection time; and (i) main results for the presence of nurse's EE and associated factors (Table 1, Appendix 1).

2.6 Quality appraisal

The study's quality was evaluated using the Joanna Briggs Institute (JBI) checklist to assess the risk of bias in each study. Two reviewers (RA; MB) evaluated all the included studies in this systematic review to assess each article' methodological quality and minimize errors. Each article had a calculated score for selecting participants, study methods, and outcome assessment to determine the inclusion or exclusion of the study in the final sample. In addition, the Joanna Briggs Institute (JBI) critical appraisal tools were used to assess the research quality of the quantitative designs (JBI, 2021). There were eight criteria for evaluating the quality of cross-sectional studies. These criteria are specific to quantitative data and stipulated as a checklist. Quality ratings of each study are considered if a study meets a predetermined set of questions (Table 2). These questions were answered with a reviewer response of whether "yes," "no," "unclear," or "not applicable" (JBI, 2021).

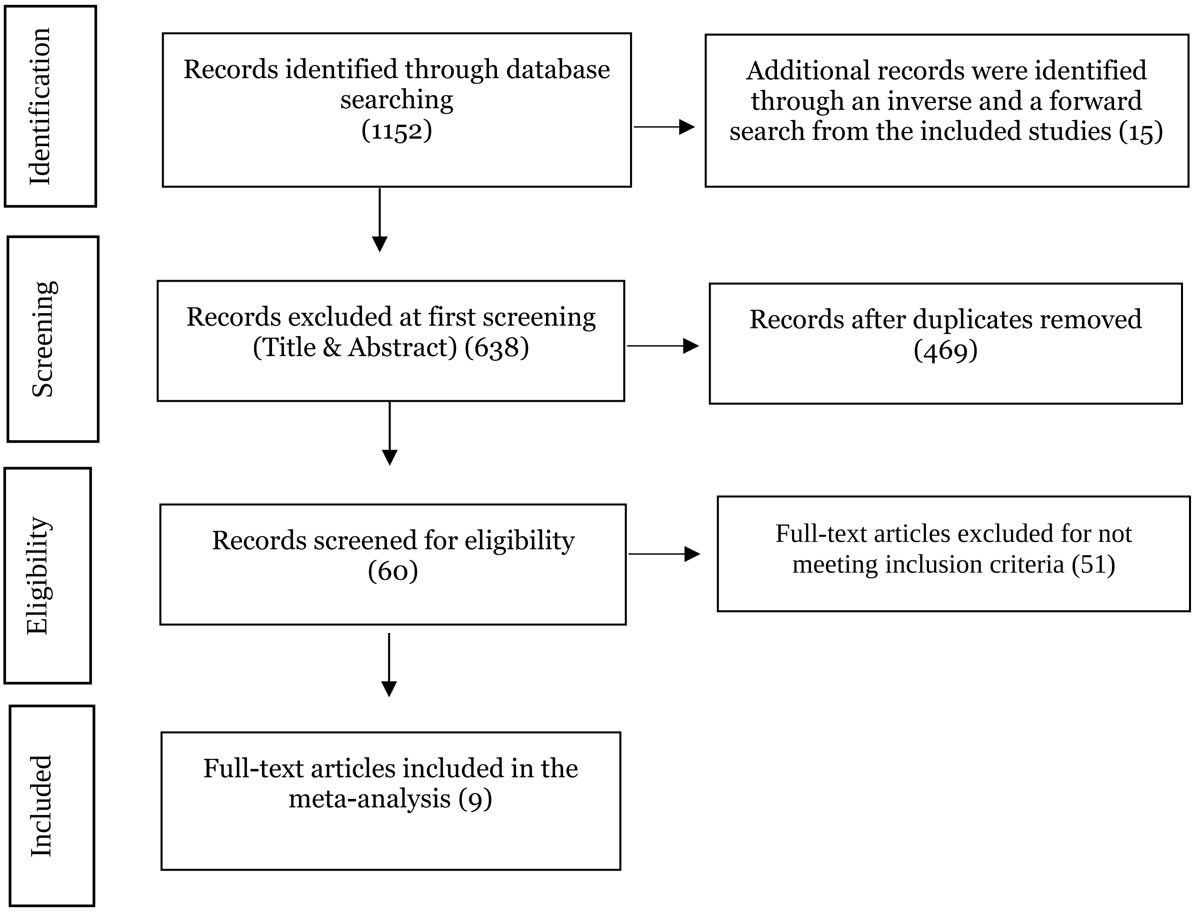

Figure 1. PRISMA flow diagram

2.7 *Data analysis*

A random intercept logistic regression model was used to estimate the pooled prevalence of EE using data from the included studies in the current meta-analysis. Heterogeneity was assessed using a maximum likelihood estimator for τ2 statistic calculation. The authors also calculated I2 and Q statistics and evaluated between-study heterogeneity using the Wald and likelihood ratio tests. The risk of publication bias was evaluated using a visual display of study estimates plotted against their precision and evaluating the expected inverted funnel plot. A formal assessment of publication bias was undertaken using Duval & Tweedie's trim and fill procedure. The authors contrasted a pooled estimate using Duval & Tweedie's trim and fill procedure with the observed pooled estimate. The authors did not perform a meta-analysis for the organizational factors associated with nurses' emotional exhaustion since the data were limited to different contexts and highly heterogeneous.

3. Results

3.1 *Search outcomes*

The search was performed in March 2022. After applying the inclusion and exclusion criteria and critically appraising the studies, a total of nine studies were selected. All selected studies were cross-sectional with sample population of 16,810 nurses. Four studies were published in 2020, two in 2021, and three in 2022. Moreover, four studies were conducted in China (Chen et al., 2020; Wan et al., 2022; Zhang et al., 2020; Zhou et al., 2022), (1) study in the United States (Sagherian et al., 2020), (1) study in Italy (Bellanti et al., 2021), (1) study in Iran (Kakemam et al., 2021), (1) study in Indonesia (Susila & Laksmi, 2022), and (1) study in India (Jose et al., 2020).

Most of the studies used a convenience sampling method (Chen et al., 2020; Sagherian et al., 2020; Wan et al., 2022; Zhang et al., 2020), while Zhou et al. (2022) used both convenience and multistage-stratified sampling methods, and two studies used a simple random method

(Jose et al., 2020; Susila & Laksmi, 2022). However, one study (Bellanti et al., 2021) did not mention the sampling method. The response rate ranged from 65% to 100%. Zhou et al. (2022) reported 65%, Wan et al. (2022) reported 87.5%, Bellanti et al. (2021) presented 71%, Jose et al. (2020), and Kakemam et al. (2021) reported a 100% response rate, while two studies did not indicate the response rates (Chen et al., 2020; Susila & Laksmi, 2022).

The overall prevalence of EE among nurses was 48.9%, and the accumulated percentage of moderate to high levels of EE ranged from 21.5%% to 76.5%% with a remarkably high heterogeneity between results. To emphasize, Kakemam et al. (2021) reported a moderate degree of EE among 218 nurses (21.7%) and a high degree of EE among 485 nurses (48.3%) from the total sample. Jose et al. (2020) reported a moderate degree of EE, 21.93%, and a high degree of EE 36.46%, among nurses from the total sample. Sagherian et al. (2020) reported overall results of increased EE among 451 nurses, showing a degree of EE in 61% of nurses providing direct care to COVID-19 patients. In addition, Chen et al. (2020) reported that 45.14% of nurses experienced EE; of them, 26.58% (n=3342) showed a moderate degree of EE, and 21.55% (n=2709) with a high degree of EE.

Also, Zhang et al. (2020) reported that EE was observed among 78.5% of the sample; 15.9% experienced moderate levels, and 6.6% experienced high levels. Moreover, Bellanti et al. (2021) reported moderate to high emotional exhaustion levels in 76.5% of the sample. Zhou et al. (2022) presented that 25.41% of nurses experienced moderate levels of EE, and 26.30% reported a severe level. Furthermore, Susila & Laksmi (2022) revealed that 20% of the nurses suffer from moderate levels of EE, while 7.1 % were at a severe level of EE. Finally, Wan et al. (2022) documented that 14.58% of the nurses (n=129) suffered from moderate levels of EE, and 8.02% of the nurses (n=71) were at a severe level. Descriptive statistics for nurses' emotional exhaustion according to the MBI tool in the studies included in this meta-analysis are shown in Table 1.

3.2 Quality assessment results

Quality assessment of the included studies showed acceptable quality ranges (see Table 2). However, considerable biases were found because some studies did not report the confounding factors and controlling strategies to eliminate them. Another frequent bias was that the studies' subjects or settings were not clearly defined in detail.

3.3 Organizational factors associated with nurses' emotional exhaustion

Organizational factors influenced nurses' EE during the COVID-19 pandemic to a considerable extent. For instance, nurses that work in high-risk work environments such as isolation departments, emergency departments, COVID-19-designated hospitals, a COVID-19 quarantine, or a critical care unit (Bellanti et al., 2021; Jose et al., 2020; Sagherian et al., 2020; Zhang et al., 2021) had a higher level of EE. In addition, increased workload, working three or more night shifts, and working more than 40 hours per week were associated with nurses' EE (Sagherian et al., 2020; Wan et al., 2022; Zhang et al., 2021; Zhou et al., 2022).

Also, nurses who perceived inadequate workplace safety against COVID-19 with insufficient personal protective equipment or worked in an unpleasant workplace environment while caring for COVID-19 patients experienced EE more frequently (Bellanti et al., 2021; Jose et al., 2020; Kakemam et al., 2021; Sagherian et al., 2020; Susila & Laksmi, 2022; Zhang et al., 2021). Other associated organizational factors were reported as living in a hospital dormitory, working with suspected or confirmed COVID-19 medical staff (Wan et al., 2022), skipping the 30-minute breaks (Sagherian et al., 2020), lower monthly salaries (Zhou et al., 2022), and current or previous direct contact with patients having infectious diseases (Bellanti et al., 2021; Kakemam et al., 2021; Sagherian et al., 2020; Susila & Laksmi, 2022).

Measures of organizational support were reported to reduce EE, such as support from team leaders (Zhang et al., 2021), emotional support, and social relationship (Bellanti et al., 2021). Table 3 presents the organizational factors associated with nurses' EE in each study.

3.4 The analytical findings

The prevalence of nurses' emotional exhaustion was measured by the standardized and valid questionnaires of the MBI in all nine studies indicating high homogeneity. However, it is worth mentioning that numerous studies in the nursing literature have measured the prevalence of total burnout dimensions with different instruments, which may provoke counterintuitive results in this meta-analysis model. Thus, it was decided to include studies using the Maslach Burnout Inventory only to calculate the prevalence of nurses' emotional exhaustion to improve the comprehensiveness and clarity of the results.

Table 3. Organizational factors associated with nurses' emotional exhaustion

Study	Organizational factors associated with nurses' emotional exhaustion
Chen et al. (2020)	Working in a COVID-19-designated hospital, working in critical care units, and departments related to COVID-19.
Wan et al. (2022)	Living in a hospital dormitory, working for three or more night shifts weekly, and having confirmed or suspected medical staff around.
Zhang et al. (2020)	Longer working time in the COVID-19 frontline quarantine areas. Support measures were reported to reduce EE, such as support from team leaders and sufficient material supply.
Kakemam et al. (2021)	Close interpersonal interaction with patients in complicated practice environments.
Sagherian et al. (2020)	Work status (Full time or part-time), hours worked per week, the unit of practice, shift length (extended shifts ≥10 hours or traditional shifts 8–9 hours), and shift types (fixed or rotating). Nurses who skipped 30-minute breaks, worked more than 40 hours per week, and provided care for a patient with COVID-19 had higher scores of EE.
Jose et al. (2020)	Inadequate workplace safety against COVID-19, inadequate PPE, and working in the emergency department.
Bellanti et al. (2021)	Working in COVID-19 units and emergency departments, workload, and direct contact with infected patients. Measures of organizational support, emotional support, social relationship, and availability of PPE.
Zhou et al. (2022)	Working at night shifts, working more than 40 hours per week, and lower monthly salaries.
Susila & Laksmi (2022)	Inadequate hospital resources and facilities, current or previous providing care for patients with infectious diseases.

Figure 2 shows the Forest plot for the effects of individual studies included in the meta-analysis and the pooled overall EE prevalence effect size. The total number of subjects surveyed was 16,810), of whom, 8,150 (48.50%) met the criteria for emotional exhaustion. The pooled estimate for EE prevalence of moderate to high levels of EE experienced by nurses was 48.9% (95% CI: 48.1% to 49.6%) based on the common effect model. However, based on the random effects model, the pooled estimate for the prevalence of EE would be 47.8% (95% CI: 34.5% to 61.4%). The random-effects analysis also determined the accepted variance weight of the individual study with a small sample size.

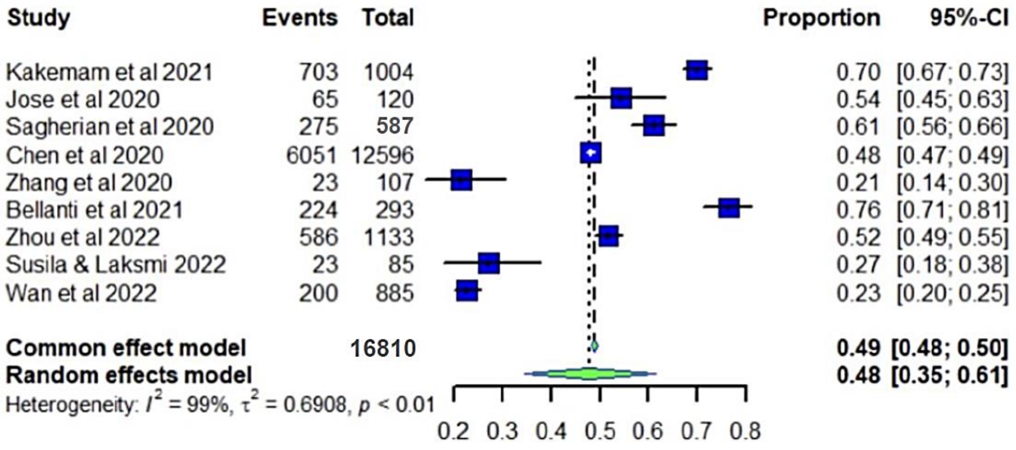

Figure 2. The pooled overall EE prevalence effect size

Regarding between-study heterogeneity, the estimate for τ2 was 69.1% (indicative of substantial between-study heterogeneity). For the I2 estimate, it was 98.5% (95% CI: 98% to 98.9%); therefore, the random effects modeling would be more appropriate for the current dataset, given the high heterogeneity, H statistic = 8.23 [95% CI: 7.14 to 9.49]. This indicates a massive difference between fixed and random effects variability estimates. More formal testing of between-study heterogeneity was conducted using the Q statistic, which was 542.41 (8 degrees of freedom) and indicated statistically significant between-study heterogeneity (p<0.0001) (Table 4).

Table 4. The formal test of between-study heterogeneity

Q statistic	Degrees of freedom	*p*-value	Test type
542.41	8	<0.0001	Wald-type
623.52	8	<0.0001	Likelihood-Ratio

In terms of assessment of publication bias, we adopted a visual examination of the studies' findings based on a funnel plot and trim-and-fill procedure. Notably, we could not find strong evidence for publication bias based on Duval & Tweedie's trim and fill procedure. The effect size for EE prevalence imputed by the trim-and-fill procedure was 47.9% which was close to the observed effect size. Due to the small number of studies used in this meta-analysis, it was not feasible to run a full Egger's test for the assessment of the symmetry of the funnel plot. See Figure 3 for a visual display of the funnel plot.

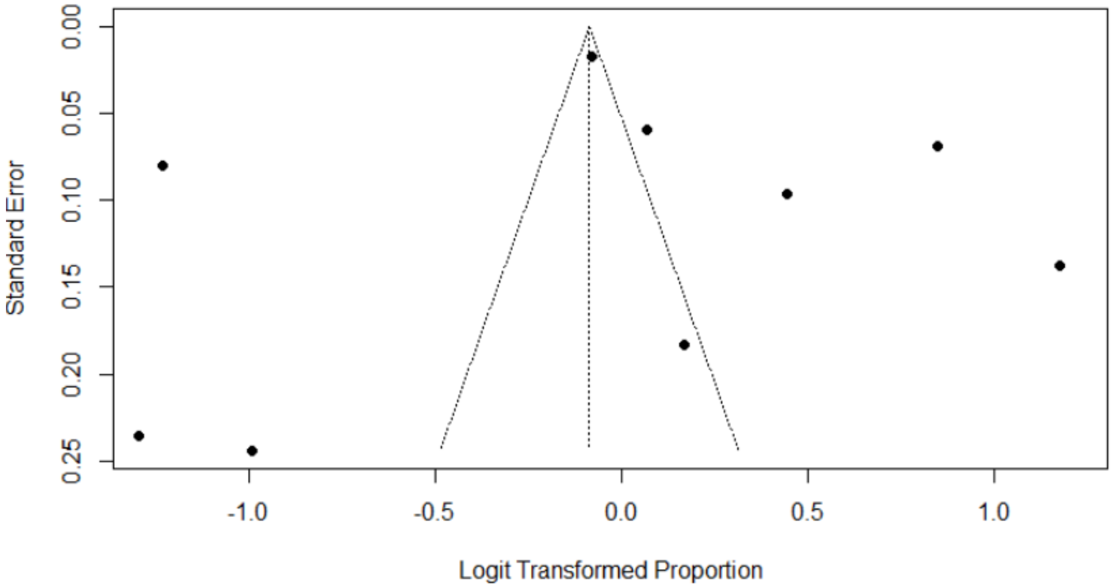

Figure 3. Funnel plot for the standard errors of estimates derived from individual studies plotted against their effect estimates.

The finding is interpretable as an overall EE prevalence of 47.8% among nursing staff; however, between-study heterogeneity was quite high, indicating substantial variability in EE estimates across different settings. There was little evidence to support publication bias among the chosen studies in this meta-analysis.

4. Discussion

This review aimed to examine the prevalence of nurses' emotional exhaustion during the COVID-19 pandemic and describe the organizational contributing factors to nurses' emotional exhaustion. This review found a significant prevalence of nurses' burnout during the COVID-19 pandemic, according to the MBI. As expected, significant differences were noted between EE levels across the nine included studies from different countries. The prevalence of moderate to high levels of EE experienced by nurses was 48.9%. In comparison with another meta-analysis, it was found that the prevalence of EE was 34.1% in Galanis et al. (2021), conducted in the first year of the pandemic in 2020, with a total of 18,935 nurses, which is lower than the current study result. A possible explanation for the current high prevalence of the pooled mean of EE is that the current meta-analysis included studies from 2020 to 2022, which means that during the start of the COVID-19 pandemic crisis and all the sudden changes in healthcare systems, as well as high rate of infected cases and dealing with a new pandemic is increasing (Bellanti et al., 2021; Jose et al., 2020). These results indicate that overall EE estimates in nurses have to be considered alarming and demand solutions to improve nurses' work conditions.

According to this review, EE is a work-related syndrome resulting from working in a highly stressful environment such as emergency departments, critical care units, COVID-19 departments units, and isolation wards. For example, nurses working in emergency departments experienced moderate to high levels of EE (Bellanti et al., 2021; Jose et al., 2020; Kakemam et al., 2021; Sagherian et al., 2020). Perhaps, the reasons may be due to uncertainty about safety, the fear of becoming infected, the urgent need for COVID-19 patient care organization across the department, and insufficient personal protective equipment (PPE) in the initial wave of the COVID-19 could be the major sources of anxiety and EE in the emergency department (Ahorsu et al., 2021).

Also, burnout and EE increased among nurses working in the critical care units during the pandemic (Bellanti et al., 2021; Chen et al., 2020; Kakemam et al., 2021; Sagherian et al., 2020). A possible reason could be because of the poor patient prognosis, especially for the elderly patients who have another respiratory problem, the increased mortality rate among confirmed COVID-19 patients, and the lack of family presence. Another possible reason is that hospitals increased the critical care bed capacity, which required transferring more nurses from general wards to the critical care units. This may contribute to nurses feeling unpreparedness or lack of competence in providing care to severely ill patients leading to EE (Bellanti et al., 2021).

Working in COVID-19 department units (Chen et al., 2020) and isolation wards (Wan et al., 2022) increased nurses' stress, EE, and feelings of isolation. In addition, nurses working in quarantine environments have to possess higher proficiency in facing greater challenges to the specifics of COVID-19 patient care and disease prevention. As a result, those nurses may be more vulnerable to stress and more likely developed to EE (Zhang et al., 2020).

Also, higher job demands, workload, and direct contact with COVID-19 patients increase work-related stress leading to EE (Bellanti et al., 2021; Sagherian et al., 2020; Zhang et al., 2020). Moreover, extended working hours, three or more night shifts per week, working with other healthcare professionals who have confirmed or suspected COVID-19 results (Wan et al., 2022), lack of emotional support (Bellanti et al., 2021), inadequate hospital resources (Susila & Laksmi, 2022) were found as negative organizational factors leading to EE (Wan et al., 2022). Therefore, future interventional studies on workload, stressful environments, and higher workplace demands during a crisis should focus on effective actions and strategies to prevent and reduce EE and burnout symptoms.

Notably, decreased self-confidence in self-protection, lack of specialized training, and lack of working safety were further influences associated with increased EE among the nurses (Jose, 2020; Zhang et al., 2020). This indicates the significant need for regular training and professional development for infection prevention and control strategies among nurses (Al Maqbali et al., 2021; Bellanti et al., 2021). These results suggest that EE levels among nurses could vary significantly between different departments and be influenced by several organizational factors. The results of this review align with the Maslach theory of burnout. Most previous results consider that significant associated factors within the workplace can contribute to nurses' EE. The present review synthesized and described the character and the sources of work-related antecedents that can result in nurses experiencing EE.

5. Implications and limitations

Nurses working on the frontline play a crucial role in health care services, especially during crises. Nurse managers should pay attention to their demands, occupational development, and personal well-being and make additional efforts. Establishing psychological consultation clinics should be prioritized to enhance nurses' mental health status. Then, a structured reward system, including improving nurses' salaries, nurse recognition, and appreciation, is highly mandated.

Providing career development plans and learning opportunities would empower nurses and increase their readiness to face challenging circumstances.

This systematic review faced some limitations. The first limitation is the limited number of included studies, so meta-regression analysis to assess further nurses' characteristics as the independent variables on EE cannot be performed. Furthermore, diverse samples in the included studies with insufficient information about the sample inclusion criteria restricted the author from understanding and analyzing the direct relationship between the dependent and independent variables. Moreover, most of the included studies were conducted in Asia, reducing the generalization of the results. In addition, there is a possibility that other studies from different databases were not included in this systematic review, although this review used several MeSH terms and four databases. Finally, all included studies were cross-sectional design, which reduced the analysis options to signify the effect of the organizational factors on nurses' EE.

6. Conclusion

As far as our knowledge, this is the first systematic review and meta-analysis to estimate the pooled prevalence of EE among nurses during the COVID-19 period. The findings confirmed that nurses have been struggling with high to moderate EE levels since the beginning of the pandemic till the current year. Furthermore, several organizational factors influence this EE level. These findings highlight the necessity for urgent interventions that can decrease psychological impacts on frontline nurses.

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Author contribution

RA, OG, and MB: Plan and design the systematic review and meta-analysis. RA: Search and data extraction. RA: Paper writing. RA and MB: Articles appraisal and data analysis. OG and MB: A paper review. All authors are responsible for the study report and provide approval of the manuscript submission.

Conflict of interest

The authors declare no personal or financial conflict of interest in this study.

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Appendix 1.

Table 1. Data extraction of the included studies

Authors	Country	Study design	Sample size & method	Data Collection Time	Results	Database
Chen et al. 2020	China	Large-scale cross-sectional study.	12,596 nurses Convince sample. Response rate not mentioned	April 2020	Moderate degrees of EE among 6051 nurses, 48% of the total sample. Influential factors relating to EE were being a woman, working in a COVID-19-designated hospital, working in critical care units, and departments related to COVID-19.	PubMed
Wan et al. 2022	China	cross-sectional	885 nurses Convince sample 87.5% response rate.	February 2020	Moderate to high degrees of EE among 200 nurses, 22.6% of the total sample. Nurses with longer than five years of work experience had higher EE. Working in isolation wards, three or more-night shifts per week, living in hotels, and being surrounded by confirmed\ suspected medical staff were all negative factors that influenced nurse's EE.	PubMed
Zhang et al. 2020	China	A cross-sectional survey	107 nurses Convince sampling. 97% response rate.	March 2020	EE was observed among 78.5% of the nurses. Moderate to severe EE among 23 nurses 21.5% of the total sample. Participants with longer working hours in COVID-19 quarantine units. EE increased with younger age and decreased with increasing working experience years	PubMed
Kakemam et al. 2021	Iran	A cross-sectional study	1,004 nurses convenience sample. Response rate not mentioned.	September - November 2020.	A moderate degree of EE was found for 218 nurses (21.7%), and a high degree among 485 nurses (48.3%) from the total sample. EE is related to low patient care quality and adverse events.	Wiley
Sagherian et al. 2020	United States	Cross-sectional study.	587 nurses convenience sample. 100% response rate.	May-June 2020	The EE among 275 nurses 61% of the total sample. EE related to worked hours per week and participants who skipped 30-min breaks.	PubMed

Table 1. Continued

Authors	Country	Study design	Sample size & method	Data Collection Time	Results	Database
Jose et al. 2020	India	cross-sectional design	120 nurses simple random sampling. 100% response rate.	August 2020	56 nurses working in the emergency experienced a severe level of EE of 36.46% and a moderate level of 21.93% among nurses from the total sample. EE was higher among nurses who had a fear of infecting family members, had confidence in self-protection, and had felt poor safety in the workplace.	PubMed
Bellanti et al. 2021	Italy	A cross-sectional study	293 nurses The sampling Method is not indicated. 71.8% response rate.	June- September 2020	A moderate to high EE 224 of nurses 76.5%. EE score was higher in females, nurses with at least one chronic disease, and nurse working for more than 20 years as compared to those working 1–5 years.	PubMed
Zhou et al. 2022	China	Multisite cross-sectional online survey	1133 nurses multistage, stratified sampling & convenient. 65% response rate.	September- October 2020	586 nurses reported EE 51.72%. Female nurses had higher EE, stage of COVID-19 outbreak, job tenure, monthly salary income, and night shift associated with EE.	PubMed
Susila & Laksmi 2022	Indonesia	cross-sectional study	85 nurses simple random. Response rate not mentioned	June 2021	Most of the respondents (72.9%) were in mild EE, 20% moderate, and 7.1 % were at a severe level of EE. Hospital resources, have co-morbidities, and previous experience of treating patients with infectious diseases were associated with nurses EE.	PubMed

Table 2. Quality of the included cross-sectional studies

Item\Study	Chen et al. (2020)	Wan et al. (2022)	Zhang et al. (2020)	Kakemam et al. (2021)	Sagherian et al. (2020)	Jose et al. (2020)	Bellanti et al. (2021)	Zhou et al. (2022)	Susila & Laksmi (2022)
1. Were the criteria for inclusion in the sample clearly defined?	√	Unclear	√	√	√	√	unclear	√	√
2. Were the study subjects and the setting described in detail?	√	√	√	unclear	unclear	√	√	√	√
3. Was the exposure measured in a valid and reliable way?	√	√	√	√	√	√	√	√	√
4. Were objective, standard criteria used for measurement of the condition?	√	√	√	√	√	√	√	√	√
5. Were confounding factors identified?	√	No	√	No	√	No	No	No	No
6. Were strategies to deal with confounding factors stated?	√	No	√	No	√	No	No	No	No
7. Were the outcomes measured in a valid and reliable way?	√	√	√	√	√	√	√	√	√
8. Was appropriate statistical analysis used?	√	√	√	√	√	√	√	√	√

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ORIGINAL RESEARCH

Self-Management and Relating Factors among Chronic Kidney Disease Patients on Hemodialysis: An Indonesian Study

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Abstract

Background: The latest approach to managing chronic kidney disease (CKD) involves the implementation of self-management methods. Nonetheless, numerous previous studies indicate that self-management behaviors remain inadequate among hemodialysis patients in Indonesia. Therefore, a deeper comprehension of the factors that affect a patient's self-management should be studied.
Purpose: This study aimed to examine self-management among CKD patients undergoing hemodialysis and its relating factors.
Methods: The study used a cross-sectional approach. A convenience sample of 164 patients undergoing hemodialysis determined using a table of power analysis was recruited from two hemodialysis centers in Padang, Indonesia, from May to July 2022. Hemodialysis self-management instrument-18 (HDSMI-18), the scale of self-efficacy for chronic diseases, and the hemodialysis knowledge questionnaire were used as the instruments. T-tests, ANOVA, Spearman correlation test, and multiple linear regression were used to analyse the data.
Results: Self-management, knowledge, and self-efficacy mean scores were 48.62(8.45), 17.77(2.96), and 43.05(10.08), respectively. There was a significant positive correlation between self-management with education (p=0.000), employment status (p=0.025), monthly income (p=0.003), knowledge (p=0.000), and self-efficacy (p=0.004). Multiple linear regression analyses for overall self-management indicated that knowledge and education were the main influencing factors of self-management.
Conclusion: Hemodialysis patients had a subpar degree of self-management. Furthermore, knowledge and education were the most significant influencing factors of self-management. Nurses are expected to be able to provide structured education to increase patient knowledge which will later yield good self-management.

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1. Introduction

Chronic kidney disease (CKD) is a complex condition in which the kidneys cannot work correctly due to structural or functional damage leading to excessive accumulation of fluids and wastes in the blood (Thomas, 2019). CKD is a significant global health issue and is seen as a major contributor to the poor health outcomes of the majority of non-communicable diseases, such as diabetes, hypertension, and cardiovascular disease (Luyckx et al., 2018). The prevalence of chronic kidney disease in Indonesia in patients aged 15 years and over was 713,783 people (0.38%) of the entire Indonesian population. West Sumatra is recorded as the fifth province with the most chronic kidney disease patients, with around 1,344 patients undergoing hemodialysis (Indonesian Renal Registry, 2018)

The rise in people with CKD has led to an increase in the number of people receiving hemodialysis (HD). HD patients have significant physical and psychological challenges and noncompliance which lead to poor adherence, which is associated with high mortality rates (Denhaerynck et al., 2007). Due to the nature of the disease and the conditions needed for hemodialysis, patients who receive treatment also report several issues like decreased self-confidence, social isolation, inactivity, and work-related issues (Mousa et al., 2018). Results can be improved by encouraging patients to self-manage their treatment plan and giving them the tools to do so. However, one of the most effective methods to reduce mortality and improve patients' quality of life is to help them better manage their own care (Griva et al., 2011).

An emerging trend in nursing care for chronic diseases like CKD is encouraging self-management. Self-management is when CKD patients actively work to reduce the occurrence of comorbidities and enable them to lead the lifestyles they choose by, among other things, monitoring and controlling their symptoms, managing their healthcare, and using the resources that are available to them (Curtin et al., 2004). According to a previous study, a key component of treatment plans for chronic diseases is the patient's capacity for self-management (Ameh et al., 2020). It has been demonstrated that people with CKD who poorly self-manage have more significant mortality. The problems of CKD patients are also decreased by improved self-management (Griva et al., 2011). Self-management refers to patients' proactive attempts to manage and take an active role in their medical care to improve their health. Patients with good self-care management will improve their quality of life (Malini et al., 2022). Managing issues and symptoms, mobilizing healthcare resources, and reducing the disease's impact on their way of life are all behaviors resulting from good self-management (Curtin et al., 2004).

The previous study showed that individuals receiving hemodialysis exercised a considerable amount of self-management (Hafezieh et al., 2020). Additionally, there was a noteworthy connection between self-efficacy, knowledge, and self-management. Therefore, patients' self-efficacy and knowledge increase in proportion to their level of self-management (Hafezieh et al., 2020). Suarilah and Lin (2022) reported that early-stage CKD patients from Indonesia showed poor health literacy levels, positive illness perceptions, and high levels of self-efficacy. Education level, monthly income, comorbidity history in the family, health literacy, and self-efficacy were found to influence self-management. Similar results were obtained from other studies that investigated the main factors influencing CKD self-management. Low health literacy, for instance, has been linked to poor self-management (Chen et al., 2018; Devraj et al., 2018), whereas self-efficacy has been linked to enhanced self-management in people with CKD (Lin et al., 2013).

Self-efficacy is a personal belief to be successful in certain situations (Mousa et al., 2018). According to the literature, increasing a patient's sense of self-efficacy is a method for treating particular diseases and can help the condition of the patient (Moattari et al., 2012). Previous research has shown that patients' knowledge, self-efficacy, the availability of social support, and depression were the main factors influencing self-management (Li et al., 2014). Inadequate patient knowledge and skills can lead to a reduction in their motivation to take preventive methods and a reduction in self-management and self-efficacy.

Previous studies have shown that the level of self-management of people undergoing hemodialysis could have been better, including in Indonesia (Natashia et al., 2019). Many studies reported factors relating to self-management. Despite inconsistent findings throughout these studies, it was discovered that age, gender, marriage, education, and occupation impacted patients' ability to control their care (Lin et al., 2013; Suarilah & Lin, 2022; Wang & Ma., 2015). Moreover, various self-management strategies and viewpoints may explain why the levels in earlier trials were not good (Curtin et al., 2004; Suarilah & Lin, 2022; Wang & Ma., 2015). Therefore, this study aimed to examine self-management among CKD patients undergoing hemodialysis and the factors influencing self-management in patients undergoing hemodialysis in Padang, Indonesia.

2. Methods

2.1 Research design

This study used a cross-sectional descriptive design and was conducted in two hemodialysis centres in Padang, Indonesia. The study collected the respondents' characteristics, self-management, self-efficacy, and knowledge of chronic kidney disease patients undergoing hemodialysis.

2.2 Setting and samples

Two hemodialysis units in two tertiary hospitals in Padang, Indonesia, were used to gather a convenience sample of 164 patients receiving hemodialysis. Adult patients aged from 18 to 65 years old, regular hemodialysis patients for at least three months, and the ability to read and write Indonesian were the inclusion criteria. Pregnant women and those who claimed mental illness like schizophrenia as well as psychological or cognitive impairments like dementia were excluded.

The sample size was determined using a table of power analysis. As many as 164 samples were estimated with a power of 90%, an alpha level of 0.05, and a medium effect size of 0.25 (two-sided) (Polit & Beck, 2008). Finally, 164 patients were included in the sample size, giving it a statistical power of 0.90, and all the participants completed the instruments.

2.3 Measurement and data collection

The study used three questionnaires. Additionally, a demographic characteristic form was utilized to determine the patients' age, gender, marital status, level of education, length of time receiving hemodialysis, and the cause of renal failure. The questionnaires were described below.

2.3.1 Self-management

Hemodialysis self-management instrument-18 (HDSMI-18) was used to measure self-management. This scale contains 18 items in four subscales, including partnership (four items), self-care (six items), problem-solving (five items), and emotional management (three items). Each question number one through four was assigned after the things were assessed on the basis of never, rare, occasionally, and always. The total result yielded a score for all HDSMI-18 questions that ranged from 18 to 72. A higher rating indicates improved patient self-management and the validation of all the questions in this instrument was>0.9 (Chen et al., 2021). Both forward and backward translations were used during the translation process. Validity was assessed using the Content Validity Index by Scale (S-CVI) and Content Validity Index for Item (I-CVI) tests. For each instrument, three separate nursing specialists participated in this process. It was computed by dividing the three experts' ratings by the total number of items on the scale (Polit & Beck, 2008). Regarding the three instruments' items' relevance, accuracy, clarity, and ambiguity, a rating of 3 or 4 was deemed sufficient. When three experts were involved, S-CVI was considered valid if the overall scale score was >0.80, and I-CVI was considered relevant if the score was 0.78. Cronbach's alpha coefficient >0.70 was indicated as appropriate for the instruments' dependability (Polit & Beck, 2008). Minor adjustments were made to the scale pattern and punctuation in the final instruments. The S-CVI for the Indonesian version of the 18 self-management items (HDSMI-18) was 0.92, and the I-CVI ranged from 0.78 to 1. Cronbach's alpha values were in the 0.82–0.88 range, indicating good reliability.

2.3.2 Hemodialysis (HD) knowledge

The creators of this 25-item questionnaire were Curtin et al. (2004). Anemia, food, medication, renal function, hemodialysis, treatment, and rehabilitation were all evaluated by this questionnaire. The responses were intended to be true or false. The right answers received one point, whereas the incorrect ones received zero, and the final score ranged from 0 to 25. The original questionnaire's content validity index was reported to be 0.70, and its reliability was 0.94 (Curtin et al., 2004). The questionnaire had undergone the translation process, including forward translation to and back-translation from Indonesian. The Content Validity Index by Scale (S-CVI) and Content Validity Index for Item (I-CVI) tests were used to evaluate validity. For each instrument, three separate nurse specialists participated in this process. It was computed by dividing the three experts' ratings by the total number of items on the scale (Polit & Beck, 2008). Minor punctuation and scale layout modifications were made in the questionnaire's final edition. The S-CVI was 0.89 for 25 hemodialysis items in the Indonesian edition, while the I-CVI ranged from 0.78 to 1. Cronbach's alpha values were in the range of 0.78 and 0.86, showing high dependability.

2.3.3 The chronic disease self-efficacy scale

Six items made up the questionnaire of the chronic disease self-efficacy scale created by Lorig et al. (1999). There are ten levels of self-efficacy, ranging from zero to ten. The better the self-efficacy, the higher the score. The original scale had a reliability score of 0.91 (Lorig et al., 1999). The questionnaire had a translation process, including forward translation to and back-translation from Indonesian. The Content Validity Index by Scale (S-CVI) and Content Validity Index for Item (I-CVI) tests were used to evaluate validity. For each instrument, three separate nursing specialists participated in this process. It was computed by dividing the three experts' ratings by the total number of items on the scale (Polit & Beck, 2008). Minor punctuation and scale layout modifications were made in the questionnaire's final edition. The S-CVI was 0.85, while the I-CVI ranged from 0.82 to 1. Cronbach's alpha values were in the range of 0.81 and 0.88, showing high reliability.

In this study, 164 patients were recruited by convenience sampling. Firstly, the researcher asked the head nurse about the total number of patients undergoing hemodialysis and informed the study's goals and methods. Secondly, head nurses helped identify participants suited for inclusion criteria. Researchers were also assisted by nurses working in the hemodialysis unit regarding participants who matched the sample criteria. Next, the researcher directly met the patients to explain the purpose of the study and distributed questionnaires. Thirdly, the self-management, self-efficacy, and patient knowledge questionnaires were completed before, during, or after dialysis, depending on the patient's preferences. Finally, the knowledge questions were asked last to lessen the impact on the other two questionnaires. Therefore, one session for 20 minutes was used to complete all three surveys. Data collection occurred in hemodialysis units at two hospitals in Padang, Indonesia, from May to July 2022. In collecting data, researchers wore personal protective equipment and followed the COVID-9 protocol as part of efforts to prevent infectious diseases.

2.4 Data analysis

The characteristics of the respondents and their self-management were analyzed using descriptive statistics. Univariate associations between the overall self-management and the participants' characteristics were assessed using t-tests and ANOVA. T-test was used to analyze gender and marital status (dichotomous data), while ANOVA was used to analyze age, education level, job, monthly income, history of being under hemodialysis, and the cause of renal failure. The data were previously tested for normality by the Kolmogorov-Smirnov test and were tested by the Levene test for homogeneity. The only variable with a normal distribution was the self-management score. Therefore, the association between self-management, self-efficacy, and knowledge was investigated using the Spearman correlation test. To determine whether employment, education, monthly income, knowledge, and self-efficacy were predictors of the self-management score, multivariate linear regression was utilized.

2.5 Ethical considerations

Ethics approval to conduct this research was granted by the Medical Research Ethics Committee of RSUP Dr.M.Djamil Padang, number: LB.02.02/5.7/162/2022. The study was conducted following the approved protocol. Informed consent was obtained from all participants before participating in this study.

3. Results

3.1 Characteristics of respondents and the correlation with self-management

Among 164 patients who completed the survey, most of them were 46-60 years old (47%), male (54.9%), married (85.4%), senior high school level of study (45.7%), unemployed (42.1%), monthly income of 2-4 million IDR (32.3%), history of being under hemodialysis (HD) more than three years (32.9%) and hypertension cause of renal failure (50.6%) (Table 1). Self-management significantly positively correlated with educational attainment, employment status, and monthly income (*p*<0.05). There was no discernible connection between other factors and self-management (Table 1). The minimum and maximum scores of HD knowledge were 10 and 24, respectively, with the mean knowledge score being 17.77 (2.96). The least and maximum self-efficacy ratings were 6 and 60, respectively, with a mean of 43.05 (10.08).

Table 1. Respondent's characteristics and their relationship with self-management (n=164)

Characteristics	f (%)	Mean (SD)	Self-management mean (SD)	t	F	*p*
Age (year)						
<25	11 (6.7)		51.45 (8.802)		0.89	0.449
26-45	42 (25.6)		48.71 (8.999)			
46-60	77 (47.0)		48.90 (8.675)			
>60	34 (20.7)		46.94 (7.036)			

Table 1. Continued

Characteristics	f (%)	Mean (SD)	Self-management mean (SD)	t	F	*p*
Gender						
Male	90 (54.9)		47.94 (8.726)	-1.12		0.263
Female	74 (45.1)		49.43 (8.085)			
Marital status						
Not married	24 (14.6)		50.46 (8.262)	-1.16		0.249
Married	140 (85.4)		48.30 (8.471)			
Education level						
Elementary School	14 (8.6)		43.79 (6.807)		90.8	0.000*
Junior High school	31 (18.9)		45.58 (7.518)			
Senior High school	75 (45.7)		47.92 (6.994)			
University	44 (26.8)		53.48 (9.685)			
Job						
Employed	41 (25.0)		50.05 (10.18)		3.19	0.025*
Retired	20 (12.2)		52.90 (8.83)			
Housewife	34 (20.7)		46.91 (5.86)			
Unemployed	69 (42.1)		47.36 (7.88)			
Monthly income (IDR)						
<2 millions	101 (61.6)		47.04 (7.56)		6.04	0.003*
2 – 4 millions	53 (32.3)		50.45 (8.80)			
>4 millions	10 (6.1)		54.80 (10.95)			
History of being under HD						
< 1 year	74 (45.2)		48.96 (9.27)		0.266	0.767
1 – 3 years	36 (21.9)		47.72 (7.14)			
>3 years	54 (32.9)		48.74 (8.17)			
Cause of renal failure						
Hypertension	83 (50.6)		48.25 (8.31)		1.32	0.271
Diabetes	41 (25.0)		47.95 (8.02)			
Urolithiasis/ urinary tract disorders	18 (11)		47.78 (7.47)			
Others	22 (13.4)		51.91 (10.17)			
Knowledge		17.77 (2.96)				
Self Efficacy		43.05 (10.08)				

Note. t= T-test, and F = ANOVA
* Statistically significant (*p*<0.05)

3.2 *Self-management and its dimensions*

The partnership subscale had an average item score of 2.46(0.84), self-care at 2.69(0.82), problem-solving at 2.74(0.80), and emotional management at 2.96(0.76). Additionally, the HD patients scored highest at the subscale for emotional management and lowest at partnership (Table 2). Regarding the responses provided by patients to the questionnaire's items about self-management, "I will definitely take care of my arteriovenous fistulae" and "I will follow the instructions of healthcare providers" was the highest mean score for self-management. The lowest mean score was "I will specifically meet dietary requirements" and "When I am thirsty for water, I will try to find ways"".

Table 2. Self-management and its dimension (n=164)

No	Items	Mean (SD)	Range
Partnership		*2.46 (0.84)*	*1-4*
1	I will discuss my expectations with healthcare providers	2.51 (0.80)	1-4
2	I will make decisions with healthcare providers	2.76 (0.83)	1-4
3	I will proactively let healthcare providers know my expectations for desired goals	2.45 (0.86)	1-4
4	I will check the settings on the dialysis machine	2.13 (0.86)	1-4

Table 2. Continued

No	Items	Mean (SD)	Range
Self-care		*2.69 (0.82)*	*1-4*
5	When I am thirsty for water, I will try to find ways	2.05 (0.84)	1-4
6	Before hemodialysis, I will cleanse the puncture site	2.81 (0.93)	1-4
7	I will specifically meet dietary requirements	1.96 (0.93)	1-4
8	I will specifically choose foods low in potassium	2.76 (0.95)	1-4
9	I will surely take care of my arteriovenous fistulae	3.31 (0.63)	1-4
10	I will follow the guidance of healthcare providers	3.26 (0.67)	1-4
Problem-Solving		*2.74 (0.80)*	*1-4*
11	I will search for information on kidney diseases	2.77 (0.79)	1-4
12	I will take the initiative to inquire about others when I ingest foods high in phosphorus	2.12 (0.99)	1-4
13	I will take the initiative to inquire others when the results of blood lab tests are not ideal	2.75 (0.82)	1-4
14	I will take the initiative to inquire about others when I have feelings of discomfort	3.10 (0.66)	1-4
15	I will take the initiative to inquire about others when I have problems concerning kidney diseases,	3.00 (0.74)	1-4
Emotional management		*2.96 (0.76)*	*1-4*
16	I will seek help from others	2.80 (0.85)	1-4
17	I reduce emotional stress from dialysis	3.00 (0.72)	1-4
18	I can talk to health providers comfortably	3.08 (0.72)	1-4
Overall Self-management		*48.62 (8.45)*	*18-72*

3.3 *The relationship between self-management, knowledge, and self-efficacy*

The relationships between self-management, knowledge, and self-efficacy were all significantly positive ($p<0.05$), as shown in Table 3. Therefore, the degree of self-management grew as knowledge and self-efficacy increased. There was a strong positive association between knowledge, self-efficacy scores, and the "partnership", "self-care", and "emotional management" dimensions of self-management. Problem-solving dimension only positively correlated with knowledge and had no significant correlation with the self-efficacy scores.

Table 3. The correlation between self-management, knowledge, and self-efficacy

Self-management	Knowledge Correlation coefficient	*p*	Self-efficacy Correlation coefficient	*p*
Overall Self-management	0.351	0.000*	0.223	0.004*
Partnerships	0.329	0.000*	0.181	0.020*
Self-care	0.278	0.000*	0.228	0.003*
Problem-solving	0.304	0.000*	0.099	0.206
Emotional management	0.201	0.010*	0.204	0.009*

Note: *Spearman correlation test, statistically significant at $p<0.05$

3.4 *Factors influencing self-management*

Multiple regression analyses were carried out based on independent variables to identify the variables affecting participants' self-management. The result revealed that education (β=-0.300) and knowledge (β=0.316) were the factors influencing self-management. Also, knowledge was found to exert the most significant influence on self-management of all the factors (Table 4).

Table 4. Factors influencing self-management

Variable	B	SE	β	t	p
(Constant)	24.332	3.781		6.435	0.000*
Education	2.845	0.669	0.300	4.251	0.000*
Knowledge	0.901	0.202	0.316	4.467	0.000*

Note: *Multiple linear regression test, statistically significant at $p<0.05$

4. Discussion

This study aimed to examine self-management among CKD patients undergoing hemodialysis in Padang, Indonesia, and how it relates to patients' characteristics, self-efficacy, and knowledge. The results showed that hemodialysis patients had a subpar degree of self-management. Furthermore, knowledge and education were the most significant influencing factors of self-management.

4.1 Self-management and its dimensions

This study reported that the mean score of self-management was 48.62(8.45). The score is low compared to previous studies (Hafezieh et al., 2020; Li et al., 2014; Suarilah & Lin, 2022). Li et al. (2014)'s study in China and Hafezieh et al. (2020)'s study in Iran showed that the mean scores of self-management among hemodialysis patients were 56.01 and 58.88, respectively. Similar research has also been reported on Java Island, Indonesia. The self-management score of patients diagnosed with early-stage CKD was 76.92(9.45) (Suarilah & Lin, 2022). This subpar degree of self-management could be caused by a low level on the partnership subscale of self-management in this study. This study also revealed that many patients rarely discuss with staff or doctors their expectations for desired outcomes. This research showed that Indonesian patients' roles were viewed as more passive. This discrepancy can be brought on by the cultural and healthcare systems that differ between Indonesia and the other nations mentioned in the research. According to self-management ideas, patients should be more active in managing their illnesses. Daily management duties should gradually move from the healthcare professional to the patient. Therefore, understanding and assisting in improving self-management depends heavily on communication and partnership (Ameh et al., 2020; Malini et al., 2022). Curtin et al. (2004) point out that self-managements by people receiving hemodialysis includes eight dimensions: making recommendations to healthcare professionals, taking care of oneself while receiving hemodialysis, seeking information, using alternative therapies, managing specific symptoms, being assertive in one's self-advocacy, managing one's impressions, and sharing responsibility.

This study also found that some demographic characteristics, such as education, job, and monthly income, were significantly correlated with self-management. Regarding education, the result is similar to Li et al. (2014)'s study, which points out that the patient's education has correlated with self-management. Patients are usually provided with standardized information about such topics as the disease process, disruptive behaviors for health, and caring skills. Highly educated people will likely easily understand information; conversely, people with low education face difficulties in translating information. When patients with high education receive information about their health, it will be well received to enhance their ability to manage their health problems (Schunk & DiBenedetto, 2020). Moreover, multiple linear regression in this study indicated that education significantly influenced overall self-management. Education up to college/university significantly impacted general self-management. This finding was consistent with a psychological study conducted by Van Prooijen (2017). The level of education influences a range of cognitive, emotional, and social outcomes (Schunk & DiBenedetto, 2020).

In terms of job and monthly income, a related study of Vietnamese patients with chronic diseases discovered that these factors also impacted self-management (Huong & Le, 2015). Mailani et al. (2022) found that many hemodialysis patients experience emotional reactions because they experience various physical problems that hinder activities and prevent regular work. As a result, they feel useless at a productive age. A Study by Hafezieh et al. (2020) also showed a significant correlation between job and self-management. Patients who work cannot be separated from income. Patients with low monthly incomes tend to find it difficult to handle daily difficulties, either intuitively or systematically (Huong & Le, 2015). Self-management was significantly influenced by family income equal to or higher than the minimum regional payment.

The findings showed that the HD patients had the highest score on the self-management subscale for emotional management and the lowest on a partnership, while the research by Li et al. (2014) in Beijing, China, showed the reverse. Meanwhile, a study by Hafezieh et al. (2020) in Iran reveals different things. The highest and the lowest mean scores of self-management dimensions belonged to self-care and problem-solving, respectively. This could probably happen since many factors influence patient self-management, such as the characteristics of the respondents, the culture in each country, and policies in the hospital. The highest subscale in this study is emotional management. In this subscale, the patients always seek help from others, are able to reduce emotional stress from dialysis, and are able to talk to health providers comfortably. Earlier research indicated that most individuals in a hemodialysis unit received support from various sources, such as family, peers, and professionals. Some patients highlighted their family as a source of strength, with their spouse and children providing care and support (Mailani et al., 2021). The support received from family, friends, and staff responsible for dialysis is essential in promoting acceptance and adherence to treatment (Stevenson et al., 2018). These forms of support are considered essential for fostering adaptive behaviors due to the emotional and physical encouragement that they provide (Cho & Shin, 2016). A previous study revealed that peer support programs positively impacted self-management among patients with chronic kidney disease undergoing hemodialysis. It is recommended that peer support programs be offered early on to help patients learn about self-management from their peers (Husain et al., 2020).

On the other hand, this study discovered that the lowest subscale of self-management was partnership. In this subscale, CKD patients have not established partnerships with healthcare providers in HD units, are not proactive in asking and discussing their expectations with healthcare providers, and are reluctant to discuss decision-making and desired goals with healthcare providers proactively. To establish a partnership in healthcare settings, patients must actively seek information from various sources, keep track of their symptoms, and collaborate on planning their health management. This behavior is the least common way to manage their health. Additionally, partnership behavior involves attending health education centers or classes to gather information (Li et al., 2014). As demonstrated by previous research, poor adherence can result from inadequate education and information delivery (Mailani et al., 2021). Patients undergoing hemodialysis in Indonesia lack education, preventing them from forming partnerships. This is due to factors such as income levels, which may limit access to the Internet for disease-related information (Suarilah & Lin, 2022). Education level was found to have a negative association with partnership behavior in this study, consistent with research conducted in the US, which suggested that higher education promotes independent thinking (Curtin et al., 2008). Educating patients about their specific kidney disease can help them understand its progression and promote the partnership as a self-management behavior. As a result, healthcare providers must take additional measures to engage patients with limited education in partnerships.

4.2 *The relationship between knowledge, self-efficacy, and self-management*

The study showed a significant positive correlation between knowledge, self-efficacy, and self-management. This was similar to studies in Iran and China claiming that self-management positively correlates with self-efficacy and knowledge (Hafezieh et al., 2020; Li et al., 2014). Self-efficacy is the conviction that one can complete a task or achieve a specific goal. In contrast, self-management is the capacity of an individual to control their thoughts, emotions, and behaviors to achieve personal goals (Lorig & Holman, 2003). According to research, people with high levels of self-efficacy are more likely to practice self-management behaviors like creating and attaining objectives, keeping track of their progress, and changing their behavior as needed in response to challenges or setbacks. The self-efficacy of patients undergoing dialysis is a valuable determinant of effective management, nursing interventions, and better outcomes (Almutary & Tayyib, 2021). Evidence shows that patients on dialysis with better self-efficacy reported better outcomes than those with worse self-efficacy (Almutary & Tayyib, 2021). Additionally, self-efficacy mediated the relationship between knowledge and self-care in CKD patients (Wu et al., 2016).

The result indicated that the self-efficacy score in this study was higher than a previous Palestine study which was 38.70(11.06) (Mousa et al., 2018). Self-efficacy was positively correlated with almost all dimensions of self-management, such as partnership, self-care, and emotional management, except the problem-solving dimension. High self-efficacy patients with CKD receiving hemodialysis demonstrated improved self-management, particularly in self-care. This conclusion is consistent with earlier renal disease research which found that self-efficacy could assist the patient in displaying self-management practices (Curtin et al., 2004; Hafezieh et al., 2020; Li et al., 2014; Smith et al., 2010; Suarilah & Lin, 2022). High self-efficacy patients with chronic illnesses are more capable of managing themselves, which enables them to live better lives with less impairment (Yusuf et al., 2017). Another study also reported that health literacy and self-efficacy significantly correlated with self-management (Suarilah & Lin, 2022).

The knowledge mean score of patients with CKD undergoing hemodialysis in this study was almost similar to the previous research by Li et al. (2014), which was 16.89(4.03). The result showed that the patients need to receive precise information about the hemodialysis process and how the procedure is carried out in detail. Suarilah & Lin (2022) showed that patients with CKD in Indonesia have a low level of health literacy. Patients may need to correctly interpret health information because doctors frequently disregard health literacy in standard patient treatment, although health information may not directly alter behavior (de Quiros et al., 2017). The study also showed that knowledge was positively correlated with self-management and all its subscales (partnership, self-care, emotional management, and problem-solving). Problem-solving dimension only positively correlates with knowledge, and no significant correlation was found between problem-solving and self-efficacy. This result is almost similar to the study by Hafezieh et al. (2020), which reported a significant positive association between knowledge and the "partnership" and "problem-solving" dimensions. Making decisions requires having access to sufficient and accurate knowledge (Lorig & Holman, 2003). According to Li et al. (2014), many participants had physical issues and tended to seek advice from others rather than conducting their own research. Hemodialysis patients should receive information on disease and therapy from healthcare professionals in order to successfully manage their condition. For younger patients, more public resources ought to be made available (Li et al., 2014). Furthermore, multiple linear regression indicated that knowledge significantly influenced overall self-management. Subjects with more knowledge noted better self-management. Making decisions requires a solid foundation of correct information. This outcome is consistent with other research (Smith et al., 2010). Smith et al. (2010) stated that individuals tended to seek assistance from others rather than conduct independent research when they encountered problems. Healthcare practitioners should educate hemodialysis patients on disease and therapy in order for them to successfully manage their health (Li et al., 2014). Enhancing health literacy facilitates is another factor affecting CKD self-management and can benefit them (Suarilah & Lin, 2022).

5. Implications and limitations

Adhering to the recommended regimen is the most challenging aspect of CKD self-management. It was discovered that knowledge and education strongly predicted the self-management score. Initiatives to improve patients' capacity to manage their treatment may be guided by our findings. The results of this study highlight the significance of improving illness-specific understanding of CKD to enhance self-management behaviors. Consequently, a better understanding of CKD is essential to enhancing self-management of CKD, particularly in the early stages, boosting human health, and stopping the progression of CKD.

Starting with the fact that all subjects were residents of Padang, West Sumatra, the study had a variety of drawbacks. Second, subjectivity could have been a problem with the self-reported data used in this study. Finally, since this study is cross-sectional, no conclusions about causality can be drawn.

6. Conclusion

Participants in this study who were receiving hemodialysis exhibited subpar self-management skills. It was discovered that factors such as education level, monthly income, employment, knowledge, and self-efficacy impacted self-management. Additionally, emotional management scored highest, and partnership scored lowest on the subscales of self-management knowledge and education were found to be predictors of self-management scores. Future studies should concentrate on analyzing how to develop educational programs that can improve CKD patients' self-management. Nurses and other healthcare providers must evaluate CKD patients' understanding of their disease and should then develop suitable education strategies to improve that knowledge. The employment of such cutting-edge approaches as SMS (Short Message System), shared decision-making, and policymakers must facilitate the utilization of digital media for patient education.

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Author contribution

FM, EH: Involved in the study design.
FM, RM, R: Collected data.
FM, EH: Analyses the data.
FM, EH, RM, R: Draft and revised manuscript

Conflict of interest

Regarding this study, their authorship of this article, and/or its publication, the authors declare that they have no potential conflicts of interest.

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ORIGINAL RESEARCH

Perception of COVID-19 Vaccination Based on Health Belief Model and the Acceptance of COVID-19 Booster Vaccination

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Abstract

Background: The COVID-19 booster vaccination proposes a spike in cases due to new infection variants. According to the Health Belief Model (HBM), vaccination acceptance is a health change behavior measured by perception. However, more information is needed about the relationship between public perception and future acceptance of the COVID-19 booster vaccination.
Purpose: This research aimed to analyze the relationship between the perception of COVID-19 vaccination based on the HBM and the acceptance of COVID-19 booster vaccination.
Methods: The research used observational analytics design with a cross-sectional approach conducted at the community of a public health center in Jember Regency, Indonesia. Purposive sampling was used to recruit 387 respondents. The inclusion criteria were people aged >18 who had received a complete primary vaccination. The research instruments consisted of some questionnaires: respondent characteristics, perceptions of COVID-19 vaccination based on the HBM, and the acceptance of COVID-19 booster vaccination. Data were analyzed using Chi-square and a logistic regression test.
Results: The results showed that most respondents accepted the COVID-19 booster vaccine (67.4%). There was a significant relationship between perception's subscales of COVID-19 vaccination, such as perceived susceptibility (p=0.001), perceived severity (p=0.001), perceived benefits (p=0.001), perceived barriers (p=0.001), cues to action (p=0.001) and the acceptance of the COVID-19 booster vaccination. Cues to action were the most dominant factor related to the acceptance of the COVID-19 booster vaccination (OR=5.265; 95%CI=3.073-9.022; p<0.001).
Conclusion: Positive perceptions of all HBM subscales, which showed a good perception in the community, indicated the high acceptance of the COVID-19 booster vaccine. For clinical practice, this research can be developed by surveying patients who have comorbidities.

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1. Introduction

Coronavirus disease 2019 (COVID-19) cases increased in December 2021 due to the new variant, namely Omicron (World Health Organization [WHO], 2021). Omicron variants can develop and damage the immune system that is initially formed in the previous dose of vaccine over time (Dolgin, 2021). As the pandemic spreads to lower-middle-income countries, there is growing concern about the risk of severe COVID-19, including in Indonesia (Efendi et al., 2022). As of March 13, 2022, Indonesia already ranks 16th in the world with the highest number of confirmed cases of 45,847,900, and a death rate of 151,414 (Worldmeter, 2022). More than one year of the COVID-19 pandemic, cases continue to fluctuate. In Indonesia, the government has established several policies based on four critical components of surge capacity: staff, goods, structures, and systems (Mahendradhata et al., 2021). Currently, available medical staffs are insufficient to deal with the potentially increased demands due to the pandemic, putting a spotlight on human resources challenges faced by the healthcare system. In addition, the surge in patients requiring hospitalization led to a shortage of medical supplies. The existing health infrastructure is still inadequate to handle the increase in COVID-19 cases (Mailani et al., 2022). Therefore, COVID-19 booster vaccines are recommended to prevent the risk of more severe symptoms.

However, the acceptance of COVID-19 booster vaccination in Indonesia is still low at 14,400,781 doses (7.01%). This condition is in line with the high number of cases of COVID-19 infection (Ministry of Health The Republic of Indonesia [MoHRI], 2022). The acceptance of the COVID-19 booster vaccination in Indonesia has created a debate in the community about whether or not the booster vaccine needs amid efforts to spread the infection of the Omicron variant (Sihidi et al., 2022). Post-vaccination death can occur because the immunity or protection forming in the body will decrease over time (Jain et al., 2021). Public perception of the new COVID-19 variant concerns the safety, the effectiveness of the COVID-19 booster vaccine, and the side effects of booster vaccination (Lai et al., 2021). The perception of susceptibility related to COVID-19 infection and barriers to vaccination affordability was high (85.4% and 88.5%, respectively), followed by the fear of contracting (56.3%), and the halal of vaccines (52.3%) (Wong, Alias et al., 2020). Some reasons for people to refuse COVID-19 booster vaccination in China are the safety of the booster vaccine, as many as 79.0%, and the concerns about the effectiveness of the booster vaccine protection as many as 75.9% (Lai et al., 2021).

According to the acceptance of the COVID-19 vaccine in the community, further interventions are forming to increase public awareness about the benefits and safety of the COVID-19 vaccine that can control the spread of the COVID-19 virus (WHO, 2021). In connection with the public response to rejecting the COVID-19 booster vaccine, it is assumed that there is concern over the uncertainty of the implications of the booster vaccine for the body's immunity. In line with that, suspicions arise about the vaccine's performance, the timing of immunity, and its usefulness to the body, causing factors affecting people who refuse the vaccine to maintain their arguments (Sihidi et al., 2022). At the same time, vaccines are one of the last solutions to treat infectious diseases. Therefore, utilizing HBM to identify people's perceptions plays an important role in improving the acceptance of COVID-19 booster vaccination.

The Health Belief Model (HBM) explains that there are perceptions about health, disease, and means in a person that can determine behavioral health that a person does to maintain his health, according to Rosenstock (1874) in Glanz et al. (2015). This concept gives the idea that a person will take action if they feel the adverse effects of the situation he experienced, hoping to improve his condition by believing in the success of an action. HBM emphasizes indicators of individual perception of a phenomenon that affects health (Glanz et al., 2015). The framework includes constructs on perceived (susceptibility, severity, benefits, barriers) and cues to action (Glanz et al., 2015; Rodriguez et al., 2021; Vebrielna, 2021).

The purpose of the study is to build on the phenomenon that occurred. The researcher wanted to know the relationship between perceptions felt by the public based on the HBM with the acceptance of the COVID-19 booster vaccination so that it could produce an output to determine the causes of perceptions that emerged in the community which affected the acceptance of the COVID-19 booster vaccination. This study used the basic theory of HBM to measure perceptions about the COVID-19 vaccination in the general public by including all five components of perception. The selection of this basis is because the concept of the HBM focuses on the basic problems of a disease related to means in a person, which can determine health behaviors that a person does to maintain health accordingly. To date, no known studies have been found on this topic in Indonesia. More information about the relationship between public perception and future acceptance of the COVID-19 booster vaccination in Indonesia is needed. Therefore, this study aimed to analyze the relationship between the perception of COVID-19 vaccination based on the HBM and the acceptance of COVID-19 booster vaccination.

2. Methods

2.1 Research design

This study used an analytical observational design with a cross-sectional approach. This survey-based study collected the perceptions of COVID-19 vaccination based on the Health Belief Model (HBM) and the acceptance of COVID-19 booster vaccination from the public community in the working area of a public health center in Jember Regency, Indonesia.

2.2 Setting and samples

The study involved the public community in the working area of a public health center in Jember Regency, Indonesia, and was conducted in May 2022. The inclusion criteria were people aged >18 who had received complete primary vaccination. In contrast, the exclusion criteria were health workers, people with mental and cognitive disorders, and the respondents who withdrew during the research. A formula developed by Lwanga and Lemeshow for an unknown population was used to determine the number of samples in this study, with estimated proportions of the population at 0.05 (Nursalam, 2020). The minimum sample was 385 respondents. Adding 10%(39) of respondents was necessary to anticipate respondents who withdrew, resulting in a total of 424 respondents. After going through the dropout stage due to samples that did not meet the research criteria, such as two respondents under 18 years old and 46 respondents who had received the COVID-19 booster dose vaccine, the number of samples that could be further analyzed was 387 respondents from 3 sub-districts in the specified area.

2.3 Measurement and data collection

The instrument used to collect the data in this study consisted of a questionnaire of participant's characteristics, the perception of the COVID-19 vaccination questionnaire based on HBM, and the acceptance of the COVID-19 booster vaccination questionnaire. The first questionnaire consisted of 9 grouped items using nominal and ordinal scales, namely evidence of COVID-19 vaccination, age, gender, marital status, education, occupation, monthly income, history of contracting COVID-19, and comorbidities.

The perception of COVID-19 vaccination questionnaire based on the HBM had a total of 34 questions modified from previous studies by Vebrielna (2021) and Lai et al. (2021), which consisted of 5 subscales: perceived susceptibility (7 questions), perceived severity (7 questions), perceived benefits (7 questions), perceived barriers (7 questions), and cues to action (6 questions). Modifications were made as there was no prior existing questionnaire found. This questionnaire measures respondents' perceptions of positive and negative perceived COVID-19 vaccinations using a Likert response of 4 points from 1 to 4, indicating strongly disagree to strongly agree. The positive perception category was determined if the total score was ≥ 21, while negative perception was categorized if the total score was <21. This questionnaire had been tested for its validity dan reliability on 50 respondents in another area that had the same characteristics as the research area. The questionnaire met the construct validity test result for perceived susceptibility of 0.456-0.737, perceived severity of 0.380-0.701, perceived benefits of 0.299-0.845, perceived barriers of 0.440-0.805, and action cues of 0.547-0.770, which indicated that the items on the scale were valid ($r>0.279$) at a significant level of 5%. Moreover, Cronbach alpha values of the questionnaire indicated good reliability, which included perceived susceptibility ($\alpha=0.749$), perceived severity ($\alpha=0.682$), perceived benefits ($\alpha=0.831$), perceived barriers ($\alpha=0.798$), and cues to action ($\alpha=0.754$).

The acceptance of the COVID-19 booster vaccination questionnaire consisted of 6 question items about willingness, support, and confidence as a result of a modification from previous studies by Vebrielna (2021) and Lai et al. (2021). The minimum and maximum scores of this questionnaire were 0 and 6, respectively. This questionnaire was categorized as "accept" (score $\geq$3) and "do not accept" (score <3) to measure the acceptance of respondents who had received the COVID-19 booster vaccination. A validity and reliability test had been conducted on the questionnaire on 50 respondents in another area that had the same characteristics as the research area. The validity test showed that all question items of the questionnaire were valid with $r=0.728-0.994$ at a significant level of 5%. The questionnaire also showed high internal consistency with a Cronbach alpha of 0.931.

Data collection was carried out offline by meeting the respondents directly according to the research criteria and providing a questionnaire sheet that the respondents filled out. The research was carried out after permission from the related public health center was obtained. The health center then provided a travel document as proof of scientific data collection at the working area of the health center. The research team collected the data by spreading the questionnaires door to door using COVID-19 health protocols, such as maintaining a distance between the research team and respondents, encouraging them to use the hand sanitizer that was provided by the research team, and encouraging them to use masks.

2.4 Data analysis

This study conducted analytical observations to describe the distribution of sample characteristics, the perception of the COVID-19 vaccination based on the HBM, and the acceptance of the COVID-19 booster vaccination. This study produced a statistical summary using the frequency and proportion in categorizing each variable for descriptive analyses. The Chi-square test was used to examine the relationship between the perception dimensions of the HBM and the acceptance of the COVID-19 booster. A logistic regression analysis followed the unadjusted analysis to measure the most dominant association of the perceived HBM subscales on the acceptance of the COVID-19 booster vaccination.

2.5 Ethical considerations

The ethics committee of the Faculty of Nursing, Universitas Jember, had approved this study, with the permit certificate number of 068/UN25.1.14/KEPK/2022. On the first page of the research questionnaire, an informed consent form informed the respondents regarding the research objectives. If the respondent was willing to participate in the study, it was necessary to provide a signature as consent.

3. Results

3.1 Characteristics of the participants

Table 1 presents the characteristics of the participants in the study. A total of 387 participants responded to the survey in this study. Most respondents had a vaccination cards (77.8%) and were women (78.8%). Less than half of the respondents were aged 36-45 years (25.6%), housewives (46.5%), and graduated from high school (37%). Almost all respondents were married (85%), had an income of less than 2,400,000,- IDR (86.3%), had never contracted COVID-19 (93.3%), and had no comorbidities (87.1%).

Table 1. Characteristics of the participants (n=387)

Characteristics	*f*	%
Evidence of COVID-19 vaccination		
Vaccination Certificate / Vaccine Card	301	77.8
Peduli Lindungi Applications	86	22.2
Age (years)		
18-25	53	13.7
26-35	75	19.4
36-45	99	25.6
46-55	84	21.7
56-65	54	14.0
>65	22	5.6
Gender		
Male	82	21.2
Female	305	78.8
Maternal status		
Married	329	85
Never married	35	9.1
Widow/widower	23	5.9
Educational level		
No formal school	35	9
Unfinished elementary school	24	6.2
Elementary school	104	26.8
Junior high school	56	14.5
Senior high school	143	37
College	25	6.5
Employment status		
Unemployment	14	3.6
Student	12	3.1
Entrepreneur/trader	99	25.6
Farmer	10	2.6
Day laborer/driver/household assistant	21	5.4
Government employees/Army/Police/state-owned enterprises	5	1.3
Private employees	39	10.1
Retired	7	1.8
Housewife	180	46.5

Table 1. Continued

Characteristics	*f*	%
Monthly income		
< 2,400,000,- IDR	334	86.3
≥ 2,400,000,- IDR	53	13.7
History of contracting COVID-19		
Yes	26	6.7
No	361	93.3
Have Comorbidities		
Yes:		
Hypertension	34	8.8
Diabetes Mellitus	4	1
Asthma	8	2
TBC	2	0.5
Cancer	1	0.3
Liver	1	0.3
No	337	87.1

3.2 *Perceptions of COVID-19 vaccination and the acceptance of COVID-19 booster vaccination*

The results of COVID-19 vaccination perceptions based on HBM are listed as positive and negative perceptions, as shown in Table 2, while Table 3 illustrates the acceptance of COVID-19 booster vaccination. As seen in Table 2, all subscales of the COVID-19 vaccination showed more positive perceptions, namely perceived susceptibility (57.1%), perceived severity (65.9%), perceived benefits (61.0%), perceived barriers (54.8%), and cues to action (57.6%). Table 3 also showed that most respondents accepted COVID-19 booster vaccination (67.4%).

Table 2. Perceptions of COVID-19 vaccination based on HBM (*n*=387)

No	Perception of COVID-19 vaccination	*f*	%
1.	Perceived Susceptibility		
	Negative Perception	166	42.9
	Positive Perception	221	57.1
2.	Perceived Severity		
	Negative Perception	132	34.1
	Positive Perception	255	65.9
3.	Perceived Benefits		
	Negative Perception	151	39.0
	Positive Perception	236	61.0
4.	Perceived Barriers		
	Negative Perception	175	45.2
	Positive Perception	212	54.8
5.	Cues to Action		
	Negative Perception	264	42.4
	Positive Perception	223	57.6

Table 3. The acceptance of COVID-19 booster vaccination (*n*=387)

No	The acceptance of COVID-19 booster vaccination	*f*	%
1.	Do not accept	126	32.6
2.	Accept	261	67.4
	Total	387	100

3.2. *Correlations between the perception of COVID-19 vaccination based on HBM and the acceptance of COVID-19 booster vaccination*

The results of the analysis showed that there were significant relationships between all perception subscales of COVID-19 vaccination and the acceptance of COVID-19 booster vaccination (p=0.001), as can be seen in Table 4. Table 4 indicates that most respondents with a positive perception of each subscale (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action) chose to accept COVID-19, which accounted for 77.8%, 76.9%, 80.1%, 85.4%, and 84.8% respectively.

Table 4. Correlations between the perception of COVID-19 vaccination based on HBM and the acceptance of COVID-19 booster vaccination (n=387)

Perceptions' subscales of COVID-19 vaccination		The acceptance of COVID-19 booster vaccination				95% CI	*p*
		Accept		Do not accept			
		f	%	*f*	%		
Perceived susceptibility**	Negative	89	53.6	77	46.4	3.03 (1.95-4.71)	0.001[a]
	Positive	172	77.8	49	22.2		
Perceived severity**	Negative	65	49.2	67	50.8	3.42 (2.18-5.36)	0.001[a]
	Positive	196	76.9	59	23.1		
Perceived Benefits**	Negative	72	47.7	79	52.3	4.41 (2.80-6.93)	0.001[a]
	Positive	189	80.1	47	19.9		
Perceived Barriers**	Negative	80	45.7	95	54.3	6.93 (4.27-11.24)	0.001[a]
	Positive	181	85.4	31	14.6		
Cues to action**	Negative	72	43.9	92	56.1	7.103 (4.40-11.45)	0.001[a]
	Positive	189	84.8	34	15.2		

Note. [a]Chi-square test; **Reference for multivariate analysis

3.3. The most dominant subscales of perceptions relating to the acceptance of COVID-19 booster vaccination

Table 5 illustrates the results of two steps of a multivariate analysis. From the step 1 analysis, it can be seen that perceived susceptibility and perceived severity should be removed as their p-values were more than 0.05. Step 2 analysis showed that perceived benefits, perceived barriers, and cues to action were significantly related to the acceptance of COVID-19 booster vaccination. However, cues to action were the most dominant subscales of COVID-19 vaccination perception relating to the acceptance of COVID-19 booster vaccination (OR=5.265; 95%CI=3.073-9.022; p<0.001). It means that respondents who had action cues were 5.265 times more likely to accept the COVID-19 booster vaccination.

Table 5. The most dominant subscales of perceptions relating to the acceptance of COVID-19 booster vaccination

	Variable	B	SE	OR (CI 95%)	*p*
Step 1	Perceived susceptibility	0.208	0.299	1.231 (0.686-2.211)	0.486*
	Perceived severity	0.540	2.289	1.715 (0.974-3.201)	0.062*
	Perceived benefits	1.093	2.275	2.984 (1.742-5.113)	0.001*
	Perceived barriers	1.637	2.276	5.142 (2.991-8.838)	0.001*
	Cues to action	1.590	2.292	4.904 (2.765-8.696)	0.001*
Step 2	Perceived benefits	1.100	0.274	3.003 (1.754-5.145)	0.001*
	Perceived barriers	1.636	0.276	5.135 (2.989-8.822)	0.001*
	Cues to action	1.661	0.275	5.265 (3.073-9.022)	0.001*

Note. *Backward LR method

4. Discussion

This study aimed to determine the relationship between the perception of COVID-19 vaccination based on the health belief model (HBM) and the acceptance of the COVID-19 booster vaccination in the community. The results found that most respondents accepted COVID-19 booster vaccination, and they had positive perceptions of COVID-19 vaccination in all subscales. There were significant relationships between all perception subscales of COVID-19 vaccination and the acceptance of COVID-19 booster vaccination, even though the action cues subscale was found to be the most dominant factor relating to the acceptance of COVID-19 booster vaccination.

The finding showed that most respondents accepted COVID-19 booster vaccination. This finding was similar to a study by Lai et al. (2021), reporting that a relatively high COVID-19 booster vaccination acceptance was obtained in China. This acceptance level was also in accordance with the presence of a new variant of COVID-19 and a moderate resurgence of cases ongoing, emphasizing the importance of booster doses of the COVID-19 vaccine and the durability of the effects of the COVID-19 Booster vaccine on the Omicron variant. Compared to the acceptance of COVID-19 primary vaccination, the acceptance of COVID-19 booster vaccination was lower in Wang et al. (2020)'s study, although it was higher in Vebrielna (2021)'s study. The higher level of acceptance of the COVID-19 booster vaccination was influenced by high public expectations with the provision of the COVID-19 booster vaccination during the transmission of the new COVID-19 virus variant (Lai et al., 2021). Acceptance is a person's willingness to be aware of a phenomenon in the environment based on conditions of passive acceptance of a problem or situation (Bloom et al., 1956, as cited in Arumsari et al., 2021). The factors that influence the acceptance of the COVID-19 booster vaccination can be affected by age, gender, marital status, education level, and sources of information, as well as other demographic factors (Al-Mohaithef & Padhi, 2020; Burke et al., 2021; Lasmita, 2021; Wang et al., 2020). Adults show high vaccination acceptance. This is influenced by knowledge and maturity in thinking (Wang et al., 2020). This study's result also confirmed the claim, reporting that most respondents were adults. In another study, women reported more associations with unexpected events with the COVID-19 vaccine, but women were more proactive in accepting the COVID-19 vaccine (Mondal et al., 2021). This is in line with the result of this study which showed that the majority of the respondents were female. The level of education is one of the benchmarks for the community toward accepting COVID-19 vaccination, where 16% of the reasons for respondents' refusal are lower levels of education (Paul et al., 2021). The efficacy of communication and information technology is one of the vital needs for the community, which has a broad impact on the need for access to information in the community (Zonneveld et al., 2020).

Based on the results of the study, the acceptance of COVID-19 booster vaccination was related to all perception subscales of COVID-19 vaccination based on the Health Belief Model (HBM), namely perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. This study reported that there was a significant relationship between perceived susceptibility and the acceptance of COVID-19 booster vaccination. People with a positive perception of susceptibility would likely accept the booster vaccines. This result was supported by (Wong, Wong et al., 2020), stating that when there are concerns about the possibility of contracting COVID-19, people will think that they are at high risk of contracting COVID-19. This condition is characterized by feelings of being at risk or being vulnerable. According to Rosenstock (1874) in Glanz et al. (2015), perceived susceptibility occurs when persons believe that they are vulnerable or at risk of contracting a disease. The greater the risk of contracting the disease, the greater the preventive behavior to reduce the risk. When the risk of disease arises, more and more preventive behaviors are better carried out by people unless for those who are contracting COVID-19 and who have comorbidities that underlie risk conditions (Lai et al., 2021). A previous study claims that perceived susceptibility refers to the chance that there is a high risk of contracting the disease (Neumann et al., 2020). Neumann et al. (2020) stated that a person's exposure starts from the extent to which they believe that they have a chance of contracting COVID-19. This statement was supported by Wong, Wong et al. (2020). The researchers point out that the vulnerability experienced by people depends on the extent to which they believe that they are at risk of contracting COVID-19 if they receive the vaccine. However, this result was different from a previous study. The study reported that 35 respondents (72.9%) who were found to be vulnerable to contracting COVID-19 did not accept the COVID-19 vaccine. This is because the respondents who felt vulnerable to contracting COVID-19 did not want to be vaccinated due to a lack of information related to COVID-19 disease (Liaumin et al., 2021).

This study found that there was also a significant relationship between perceived severity and the acceptance of COVID-19 booster vaccination. People with positive perceived severity tend to accept the COVID-19 booster vaccination. In accordance with the HBM, which states that the more serious the impact caused by a disease, the greater the urge to take precautions. The perception of the severity of contracting COVID-19 was related to the intention to accept the COVID-19 booster vaccine (Lai et al., 2021). A previous study found that a positive perceived severity was one of the factors that influenced the respondent's request to accept the COVID-19 vaccine (Erawan et al., 2021). People have a solid vulnerability to the risks derived from the severity of contracting COVID-19 when they are about to accept a COVID-19 vaccination (Zampetakis, 2021). Perceived severity is an individual's subjective perception of how serious the consequences of the illness he suffers are. The more serious the threat of disease, the stronger a person's urge to take preventive action or avoid the danger (Glanz et al., 2015)

In addition to the result of this study, perceived benefits had a significant relationship with the acceptance of the COVID-19 booster vaccination in individuals. This result was in line with studies by Lin et al. (2020) and Shmueli (2021), which reported that there was also a relationship between high perceptions of the benefits of COVID-19 vaccination and increased acceptance of COVID-19 vaccinations. People can understand the benefits of booster vaccination resulting in a positive perception that affects the intention to accept vaccination (Lai et al., 2021). The perception of benefits or a person's belief that the preventive actions he takes provide benefits for his health condition can reduce the risk of developing a disease (Glanz et al., 2015).

The perceived barrier subscale in this study was significantly related to the acceptance of COVID-19 booster vaccinations. This result is in line with a previous study which stated that respondents with perceived barriers doubted the effectiveness and safety of the COVID-19 vaccine (Wong, Alias et al., 2020). Barriers can be related to vaccination inconveniences such as access, cost, and time with negative results in accepting COVID-19 vaccinations (Burke et al., 2021). For someone who has a history of hypertension and diabetes, this condition will bring up more severe clinical manifestations, resulting in some obstacles to vaccination (Liu et al., 2020). The HBM explains that someone with a high perception of barriers will have a lower tendency to take preventive action. In other words, if people have increased perceived barriers, they tend to commonly accept COVID-19 vaccination (Glanz et al., 2015).

Apart from the other subscales, cues to action subscales were not only significantly related to but also were the most dominant factor relating to the acceptance of COVID-19 booster vaccination. People who had action cues were 5.265 times more likely to accept the COVID-19 booster vaccination. This result is supported by a previous study reporting that the cue to act was a significant predictor of the acceptance of the COVID-19 vaccine (Shmueli, 2021). Information aligns with good knowledge to affect the action (Al-Mohaithef et al., 2020). It is linked to the easiness of finding the correct information about the COVID-19 booster vaccination through the mass media and health workers. Providing the correct information to the public is focused on providing confidence about vaccine safety to achieve high vaccine acceptance (Karlsson et al., 2021). The support provided is a form of encouragement to help individuals solve a problem or motivation to carry out specific actions (Yazia et al., 2020). The action cues subscale in the HBM is influenced by perceived vulnerability and benefits. Other factors can only potentiate in the form of environmental events that trigger actions (Glanz et al., 2015).

5. Implications and limitations

This research has implications for nursing and health policies to maintain the health behavior of Indonesian people during the COVID-19 pandemic. Primary prevention or prevention through education is one of the roles of nursing in improving public health status, which urgently needs to be intervened during the COVID-19 pandemic. Understanding the relationship between COVID-19 vaccination perceptions based on the Health Belief Model (HBM) in the community and the acceptance of COVID-19 booster vaccination means that applying a multidisciplinary and multifaceted approach is very important. For example, the collaboration between clinical nursing and community nursing forms an interdisciplinary health team that provides health services that can provide a platform for education and vaccination service providers, using online and offline counseling platforms, and health screening, especially in vulnerable groups, before carrying out a COVID-19 booster vaccination.

There are some limitations of this study. First, the total primary dose of COVID-19 vaccination recipients was mixed with vaccine recipients from various regions other than the health center where the study took place. Second, the questionnaire used in this study had not been psychometrically tested as a qualified instrument, so it was likely to affect the results of the study. In addition, the HBM perception questionnaire could not measure the overall relationship to each component, so this study could only find the relationship between each subscale of the perception and the acceptance of the booster vaccination.

6. Conclusion

The findings concluded that public perceptions based on the HBM related to the acceptance of the COVID-19 booster vaccination in the community. The five subscales of the COVID-19 vaccination perceptions (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action) showed positive results that related to the acceptance of the COVID-19 booster vaccination. The most dominant factor related to the acceptance of COVID-19 booster vaccination was cues to action. This study recommends future research to look at the latest phenomena that have occurred because the conditions of the COVID-19 outbreak along with the COVID-19 vaccination program are currently still running and carry out a psychometric study for the instrument used in this study. For clinical practice, this research can be developed by surveying patients who have comorbidities.

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Author contribution

REPAKD: Conceptualization, design analysis of data collection, interpretation of results, manuscript preparation.

REPA, JHS, and AN: Confirming the eligibility for this study and involved in preparing the article.

JHS and AN: supervising the entire research and approving the final version of the article.

Conflict of interest

The authors declare that there were no actual or potential conflicts of interest in the research process.

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ORIGINAL RESEARCH

Health Care Providers' Perceptions of the Ministry of Health's Organisational Readiness for Change

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Abstract

Background: Whenever an organisational change is mentioned in any research context, the uncertainty concept is usually mentioned as it is or as synonymous with lack of information, ineffective communication, and/or weak feedback. Since no previous studies have investigated the organisation's readiness to change in Saudi Arabia, this study will provide empirical evidence regarding these critical components.
Purpose: The study aimed to explore how healthcare providers in the Ministry of Health perceive the ministry's readiness to change.
Methods: A descriptive cross-sectional correlational design was used for this study. Three public hospitals under the Ministry of Health were involved in recruiting 420 healthcare providers using a convenient quota sampling. A personal data sheet and the organisational readiness for implementing change (ORIC) scale were used for data collection. ANOVA and t-tests were used to analyze the data.
Results: The total response rate was 70%. The participants in the study perceived their organisation to be highly ready to change (3.76±0.73). The organisational readiness to change perceived by nurses (3.86±0.98) was significantly greater than that perceived by physicians (3.56±0.90) and allied healthcare providers (3.61±0.92), with a p-value of 0.001. In addition, the organisational readiness to change was significantly related to the participants' specialty, age, experience, and gender ($p<0.05$).
Conclusion: The findings showed that participants believed that their organisation was highly ready to change. Participants' specialty, age, experience, and gender were significantly related to organisational readiness to change. This study recommends that leaders need to be proactive in managing changes by assessing the change readiness in their organisation and setting out plans to prepare the organisation.

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1. Introduction

The Kingdom of Saudi Arabia is undergoing a huge strategic change in all government entities. The Ministry of Health (MOH) is seeking to implement several health initiatives related to the National Transformation Program (NTP) 2020 and Saudi Vision 2030. The reform involves all levels of ministry directories, hospitals, specialised clinics, and primary health centres. Moreover, policies are changing and there are new projects to fulfill the vision strategy, like patient-centred care and patient experiences. Hospitals and primary centres are collected into health clusters when preparing for the expansion of the privatisation of health services and reducing the cost of health services. The utilisation of resources will be improved and the use of information technology will become efficient by initiating digital health records for Saudi citizens (Almuqati et al., 2022). Efforts to implement new changes, policies, or practices in health organisations often fail, as the management in most of these settings rarely creates adequate administrative readiness for change. In healthcare organisations, readiness to change has been defined as "capacity to implement change designed to improve performance" (Alharbi, 2018a, pp.45-51). A US study has shown that a previous history of change, culture, and the plan for organisational change influence the organisation's readiness and its ability through its social and technical systems to initiate and sustain that change (Dhingra & Punia, 2016). Moreover, commitment to change was seen as "a mindset that binds an individual to a course of action deemed necessary for the successful implementation of a change initiative" (Bouckenooghe et al., 2015, pp. 578–595). In 2015, a study to assess readiness to change in 23 Swiss hospitals, where 1,833 nurses filled out questionnaires, showed that nurses were adequately ready for change and that a supportive leadership environment, staffing, and resource adequacy were correlated to readiness to change (Sharma et al., 2018).

Disclosure of information is classified as informational fairness by the organisational leadership, and it forms a critical part of organisational justice. Alharbi (2018a) conducted research in Saudi Arabia involving 18 hospitals and found that transformational leadership and maintaining a close relationship with followers had a significant positive influence on an organisation's readiness to change. Another research has supported the same relationship between the organisation's readiness to change and transformational leadership, in addition to effective communication and organisational commitment (Alharb, 2018a). Based on the argument that "consistent availability of team members can impact teamwork and organisational outcomes," Rodriguez et al. (2016, pp. 286–295) carried out a cross-sectional study using 628 primary care providers to examine the relationship between the availability of team members, teamwork and an organisation's readiness to change. The relationship between organisation type and readiness to change was also investigated in a study in Jordan. This study compared the readiness of four government hospitals and three private hospitals, and showed that government hospital staff and female staff perceived their organisations as more ready to change (Amarneh, 2017). Similarly, the organisations' policies and procedures had a positive or negative effect on the evaluation of task requirements, availability of resources, and situational elements of the members of the organisation (Ahmad et al., (2017).

Previous research involving 41 nurses in Egypt (Abd-Elkawey & Sleem, 2015) also showed that individual characteristics have no significant relationship to readiness to change, unlike their association with organisational commitment. However, organisational readiness to change is positively associated with structure empowerment and negatively associated with high-control organisational climates. On the contrary, another study showed that gender, educational level, and experience are positively related to readiness to change. Job motivation and employee competence are also positively related to organisational readiness to change (Amarneh, 2017).

The Ministry of Health, Saudi Arabia is now working on health reform focusing on sixteen objectives which are challenging. The lack of evidence about the organisation's readiness to change requires this study to be conducted. Since no previous studies have investigated the organisation's readiness to change in Saudi Arabia, this study will provide empirical evidence regarding these critical components. The results will provide leaders in healthcare organisations with suggestions on how to improve their organisation's readiness to change, enhance their employees' understanding of the new strategies, and involve employees in identifying ways to implement strategies. Accordingly, this study was conducted to explore how healthcare providers in the Ministry of Health perceive the ministry's readiness to change.

2. Methods

2.1 Research design

This study was conducted using a descriptive cross-sectional correlational design. This design was selected for the study as it describes the phenomenon, examines the relationship, and does not search for causality. It involves the analysis of data collected from a population, or a representative subset, at a specific point in time, which is cross-sectional data (Polit & Beck, 2017).

2.2 Setting and samples

This study was conducted at three hospitals under the Ministry of Health, Saudi Arabia. The population of the study included all healthcare providers working in the selected settings. According to the specialty classification, the population consisted of nurses, physicians, and allied healthcare professions (AHCP) (pharmacists, laboratory specialists, physiotherapists, and dietitians), with a total accessible population of 5,968.

A nonprobability sample was selected in this study, as they were selected based on convenience and quota. Determining the sample size was done in two steps. In step one, the minimum sample size required was calculated using Slovin's formula (Slovin, 1960). The result of the formula was 375, with addition to 10% to cover the cases of dropout and non-responses, resulting in a sample of 413 participants as a minimum. In step two, a quota sample was calculated by dividing the accessible population into strata and calculating their proportions of the total population. The quotas of the study participants per health care provider and per hospital are shown in Table 1

Table 1. The quota and target samples

	Quota (%)	Target Samples
Nurses	64.84	268
Physicians	19.98	83
AHCP	15.16	62
Total	100	413
Hospital A	66.00	277
Hospital B	16.40	69
Hospital C	17.60	74
Total	100	420

Participant recruitment was based on the following inclusion criteria: healthcare providers who were employed by the Ministry of Health, presented during the period of data collection and consented to participate in the study. Subjects were excluded from the study if they had been employed in their present position for less than a year, dropped out, or did not complete the questionnaire.

2.3 Measurement and data collection

The questionnaire was composed of two parts. The first part was demographic data, comprising age, gender, nationality, years of experience, specialty, and educational qualification. The Organizational Readiness for Implementing Change (ORIC) (Shea et al., 2014) was the second portion of the complete questionnaire. The scale comprises twelve items, with five measuring commitments to change and seven measuring efficacies. The items are measured on a five-point Likert-type scale (disagree=1, somewhat disagree=2, neither agree nor disagree=3, somewhat agree=4, and agree=5). There are five categories of the organisational readiness based on the mean score, which are very high (mean score of 4.30-5.00), high (mean score of 3.50-4.29), moderate (mean score of 2.70-3.49), low (mean score of 1.90-2.69, and very low (mean score of 1.00-1.89) (Shea et al., 2014). The scale demonstrated adequate psychometrics in the healthcare field and had reliability coefficients of between α=0.91 and α=0.89 (Shea et al., 2014). In this study, a pilot study was carried out on 42 participants to ensure the clarity and applicability of the study measures. No modifications were needed to test the feasibility and applicability of the study tool. Using the Pearson correlation coefficient between the responses on each item and the total score of all respondents on all items, all items showed levels of significance of 0.01 which meant that all items in this instrument were valid. The Cronbach alpha coefficient for the questionnaire was 0.96, indicating that the questionnaire was reliable with high internal consistency.

After achieving the validity and reliability of the instrument, the questionnaire was distributed to the main samples to collect data. English language questionnaires, along with an invitation letter, were distributed by the researchers and the nurses in charge of the respondents in hospitals. Participants were asked to sign the consent forms and complete the paper questionnaires. The questionnaire was distributed and collected during their working shift. Researchers were present during the shift to respond to any questions. The data collection was done within six weeks between 19 March 2019 and 5 May 2019.

2.4 Data analysis

SPSS version 22 was used for the statistical analysis. The statistical test included frequency, percentage, mean, variance, and standard deviation. Analysis of variance one-way (ANOVA) and t-test were used to analyze the relationship between the demographic variables and the organisational readiness to change.

2.5 Ethical considerations

The institutional review board reviewed and approved this study at King Saud University, on 12/03/2019, with a reference number KSU-HE-19-133 and from the Ministry of Health institutional review board (IRB) with number 19-142E. Before participation, the purpose of the study was explained to the participants on the information page. When a participant checked "I agree" on the informed consent page, they were giving their consent to participate in the study.

3. Results

Of the 600 questionnaires distributed, 447 were returned, and 27 questionnaires were excluded due to incompleteness resulting in 420 questionnaires included in the study. The total response rate was 70%. The response rate for A hospital was 79.14%, while the response rate for B and C hospital was 59.2% and 55.2%, respectively.

3.1 Characteristics of the participants

As shown in table 2, most of the participants were from A hospital (66%), nurses (65%), at the range age of 22-31 years (47.6%), female (72.4%), bachelor (74.3%), non-Saudi (50.5%), and had working experience ranging from 5 to 10 years (40.7%). Furthermore, specialty, age, working experience, and gender were significantly related to the organisational readiness to implement change. The organisational readiness to change perceived by nurses (3.86±0.98) was significantly greater than that perceived by physicians (3.56±0.90) and allied healthcare providers (3.61±0.92), with a *p*-value of 0.001. The older participants perceived their organisation to be more ready to change than younger participants (*p*=0.010). The participants with more experience perceived their organisation to be more ready to change than those with less experience (*p*=0.037). Female participants significantly perceived their organisational readiness to change (3.84±0.97) more than male participants (3.56±0.90). In contrast, work setting and educational qualification were not significantly related to the organisational readiness for change (*p*=0.382 and *p*=0.639, respectively).

Table 2. Characteristics of the participants (n=420)

Characteristics	f (%)	ORIC Mean(SD)	*F/t*	*p*
Hospital				
A	277(66.0)	3.42 (0.87)	0.964	0.382**
C	69 (16.4)	3.20 (0.81)		
B	74 (17.6)	3.32 (0.84)		
Specialty				
Physician	84 (20.0)	3.56 (0.90)	7.017	0.001**
Nurse	273 (65.0)	3.86 (0.98)		
Others (AHCP)	63 (15.0)	3.61 (0.92)		
Age (years)				
22- 31	200 (47.6)	3.66 (0.93)	3.832	0.010**
32- 41	169 (40.2)	3.80 (0.97)		
42- 51	47 (11.2)	4.01 (1.02)		
52- 61	4 (1.0)	4.18 (1.06)		
Gender				
Male	116 (27.6)	3.56 (0.90)	-3.699	0.0001*
Female	304 (72.4)	3.84 (0.97)		
Experience (years)				
> 5	141 (33.6)	3.71 (0.94)	3.317	0.037**
5-10	171 (40.7)	3.71 (0.94)		
< 10	108 (25.7)	3.92 (0.99)		
Educational qualification				
Diploma	68 (16.2)	3.77 (0.97)	0.564	0.639**
Bachelor	312 (74.3)	3.75 (0.95)		
Master	29 (6.9)	3.70 (1.00)		
Doctorate	11 (2.6)	3.78 (0.90)		
Nationality				
Saudi	208 (49.5)			
Non-Saudi	212 (50.5)			

Note. *t-test, **ANOVA

3.2 Level of perceived readiness to change in organisation

Table 3 illustrates the organisational readiness to implement change (ORIC) perceived by healthcare providers. The total mean score of ORIC was 3.76±0.73, meaning that the participants in the study perceived their organisation to be highly ready to change, as a greater score would have indicated greater change readiness. The mean score for the change efficacy subscale was 3.75±0.75, where the item "people who work here feel confident that they can coordinate tasks so that implementation goes smoothly" had the highest mean score (3.81±0.89) and the item "people who work here feel confident that they can manage the politics of implementing this change" had the lowest mean score (3.66±0.93). In addition, the mean score for the change commitment subscale was 3.79±0.76. In this subscale, the item "people who work here want to implement this change" had the highest mean score (3.90±0.89), while the item "people who work here are motivated to implement this change" had the lowest mean score (3.72±0.95).

Table (3). Organisational readiness to implement change (ORIC)

ORIC items	Mean	SD	Rank
Change Efficacy		3.75±0.75	
People who work here feel confident that the organisation can get people invested in implementing this change.	3.77	0.97	4
People who work here feel confident that they can keep track of progress in implementing this change.	3.75	0.95	5
People who work here feel confident that the organisation can support people as they adjust to this change.	3.70	1.00	6
People who work here feel confident that they can keep the momentum going in implementing this change.	3.77	0.87	3
People who work here feel confident that they can handle the challenges that might arise in implementing this change.	3.78	0.90	2
People who work here feel confident that they can coordinate tasks so that implementation goes smoothly.	3.81	0.89	1
People who work here feel confident that they can manage the politics of implementing this change.	3.66	0.93	7
Change Commitment		3.79±0.76	
People who work here are committed to implementing this change.	3.83	0.90	2
People who work here will do whatever it takes to implement this change.	3.73	0.97	4
People who work here want to implement this change.	3.90	0.89	1
People who work here are determined to implement this change.	3.76	0.89	3
People who work here are motivated to implement this change	3.72	0.95	5
Overall ORIC		3.76±0.73	

4. Discussion

The current study aimed to explore how healthcare providers in the Ministry of Health perceive the ministry's readiness to change. Overall, the study's findings showed that organisational readiness to change is highly ready across hospitals. The mean score of all items of the ORIC was 3.76±0.73, which meant that the participants in the study perceived their organisation to be highly ready to change, as a greater score indicates greater change readiness. There was agreement from the participants in general about all items of (ORIC) since the value of the standard deviation was less than two. The finding of the study showed that the change efficacy subscale in ORIC was moderately high, where the item "people who work here feel confident that they can coordinate tasks so that implementation goes smoothly" was the highest and the item "people who work here feel confident that they can manage the politics of implementing this change" was the lowest. The finding of the study also showed that the change commitment subscale in ORIC was moderately high, where the item "people who work here want to implement this change" was the highest and the item "people who work here are motivated to implement this change" was the lowest.

Readiness to change is a multilevel and multifaceted construct. In this study, the readiness to change was examined at the organisational level by measuring shared change commitment and shared change efficacy. Organisational readiness for change reflects members' commitment to change and change efficacy in carrying out organisational change. It shows how favourably the organisation appraises the three key determinants of change implementation ability: task demands, resource availability, and situational factors. When organisational readiness for change is high, members are more likely to initiate change and display more cooperative behaviour and, in turn, effectively manage the change (Billsten et al., 2018). Another study investigated factors associated with Egyptian nurses' readiness for organisational change using a descriptive exploratory design and a convenience sample of 179 nurses. The samples showed moderate readiness and low resistance to organisational change. Also, nurses' readiness for organisational change correlated positively with the professional nursing practice environment (PNPE) and structural empowerment and negatively with dispositional resistance to organisational change and the emotional climate (El-Sayed et al., 2018).

The findings of this study were similar to those found by Alharbi (2018b) in an analysis of the Saudi health system and readiness for a transformation plan. The analysis concluded that as the resources are available, contextual factors are aligned, organisation members will employ maximum effort demonstrate greater engagement and commitment to the plan, and the readiness will be high, enabling the Saudi transformational plan to be implemented with less resistance. In this study, participants acknowledge the need for change, enhancing the organisational readiness. In our finding, the item linked to "want to" has higher agreement among the commitment items. People usually want to implement the change for different reasons, which make them committed to the change and show enhanced organisation readiness. This finding was supported by that found by Alharbi (2018b). When resources are available and situational factors aligned, employees will take the initiative to change and engage in more cooperative behaviour that can lead to the efficient and effective implementation of change.

Furthermore, organisational readiness for change is linked to leadership capacity, which means the skillful involvement of staff in the work of leaders (Nilsen et al., 2018). Effective top management helps employees to implement their creative ideas and effectively manage organisational change (El-Sayed et al., 2018). Leaders should focus on the timing of the change, the amount of information disseminated, and training on change management. This will have a positive influence on employees' attitudes toward organisational change (Nilsen et al., 2018). Open communication and training help employees to accept and integrate change successfully (Sharma et al., 2018). In this study, the change commitment level is higher in comparison with change efficacy. The pattern of greater change commitment than efficacy may be due to the perceived need for change and improvement in a busy and stressful environment (Storkholm et al., 2019). Even though the three hospitals in this study are in different stages of change and in implementing the National Transformation Program (NTP) objectives, they have approximately the same level of readiness. Other research findings were different and revealed that readiness varies between hospitals and departments based on the type of leadership, staffing, culture, training opportunity, and resource availability (Sharma et al., 2018). The finding of this study shows that employees' characteristics influence readiness to change. As an individual factor, readiness for change is associated with people's characteristics, attitudes, and preferences in terms of organisational readiness for change (Nilsen et al., 2018). As an organisational factor, readiness for change refers to job characteristics that empower employees with the attitudes, skills, and opportunities to manage change. In addition, it focuses on emotional climate and structural empowerment. Emotional climate helps to provide a structure for assessing the role of emotion in organisational readiness for change. Structural empowerment is an organisation's ability to give access to information and resources as well as supportive work environments (Nilsen et al., 2018).

Currently, various organisations consider models like the McKinsey 7-S approach and the ADKAR model as pivotal pillars for facilitating their workplace transitions. McKinsey 7-S Model, as its name suggests, sets on seven stages when handling organisational changes. These include strategy, structure, systems, shared values, style, skills, and staff. The planning strategy encompasses the tactics relied on upon developing and upholding a framework. The structure, on the other hand, includes the manner in which an organisation's elements are consolidated or the structure used for achieving the desired outcomes. Systems define the necessary regulation activities that ought to be undertaken regularly to meet the sought-after results; it also includes the processes in which such activities have to take place for changes to be managed with efficacy. At the same time, shared values are the core value that is expected to safeguard an organisation. The style encompasses the technique adopted in leading the development, implementation, and maintenance of changes, while the staff features the labor force relied upon by an organisation in terms of its availability, numbers, or potential. Lastly, the skill includes the competence and expertise possessed by an organisation's staff. The seven steps are further classified as either soft or hard based on their levels of significance and ease of identification (Perez, 2015). The second model is the ADKAR approach. This change management model gives much credit to the key steps that will lead to the attainment of the desired change. With ADKAR, an organisation must focus on achieving simpler goals as they are interlinked to the overall objectives of a change cumulatively. Therefore, it serves as a suitable change approach in scenarios where an organisation seeks to detect flaws or incompetence in the awaiting changes, therefore seeking ideal methods of alleviating or counteracting them. ADKAR approach comprises five steps, namely awareness, desire, knowledge, ability, and reinforcement (Perez, 2015).

In this study, the organisational readiness to change was influenced by employee specialty, whereas nurses had more collective readiness than other specialties in this regard, which meant that the organisational readiness to change perceived by nurses was more than by physicians and allied healthcare providers. The result contradicts those found in another research, where physicians had more readiness to change (Rodriguez et al., 2016). Organisation readiness to change was affected in this study by participant experience, as more experienced employees had more collective readiness to change. This means that the participants who had more experience perceived their organisation to have more readiness to change than participants who had less experience. This result was different from Khammarnia et al. (2014)'s study, which reported that employees who had more experience had lower readiness to change. The study locations and methodological approaches may play a crucial role in explaining why different results were obtained. When faced with organisational change, people may also feel anxious, and they will have a tendency to adhere to their own beliefs due to poor communication, insufficient information, and a lack of involvement in the development of any change program. Additionally, employees who have been in their positions for a longer period are satisfied. The longer they have worked there, the more favorable their opinions of magnet hospital aspects were. Moreover, female and older employees in this study had more collective readiness than others. These results contrast other studies that revealed that gender, age, and profession had no impact on organisation readiness to change (Abd-Elkawey & Sleem, 2015; Rodriguez et al., 2016; Storkholm et al., 2019). The sample size, study settings, methodology, and population characteristics may all play a significant role in explaining why results from the studies turn out differently. According to the researchers, female nurses are more emotionally stable than male nurses, more satisfied and committed because of their financial burdens and family responsibilities, and they have good and positive relationships with their supervisors and peers, all of which help them to be more open to change. Likewise, younger workers are more likely to welcome organisational change and are also less resistant to it. Therefore, in contrast to older employees, they were prepared for and amenable to organisational change.

5. Implications and limitations

The need to stay at a high level of readiness for change is important in the age of agile organisations and competitiveness. The results of this study could be used by healthcare organisation leaders to encourage readiness for change in the healthcare sector. Leaders need to be proactive in managing change by assessing the change readiness in their organisation and setting out plans to prepare the organisation, which can be done using change management models such as the McKinsey 7-S Model and ADKAR Model. Organisation administrators should also pay more attention to making the resources to support reform available to all staff in implementing change.

Even though the results of this study contribute to the field of change management in healthcare, it is important to consider some limitations of this study. First, there is the question of whether the results from this study on change readiness in the Ministry of Health can be generalised to other organisations. Second, since our research was investigated in the healthcare sector, its outcomes are not represented by all healthcare professionals; thus, consideration is required to generalise our findings. Third, data from the sample was gathered at just one point in time. Because of this, there should be caution in making claims about the directionality of the relationships between variables in this study, limiting our ability to make causal inferences. Fourth, the hospitals were at different phases of change. Employees' changing attitudes may alter over the change phases. Fifth, because all of the measures used were self-report, objective understanding of strategy by employees was not evaluated, although it is reasonable to assume that such a measure would be important.

6. Conclusion

The findings of this study showed that participants believed that their organisation was highly ready to change. The ORIC efficacy dimension was reasonably high, with greater values indicating more change efficacy. As for the differences between demographic characteristics regarding organisational readiness to change among healthcare providers working for the Ministry of Health, it was discovered that organisational readiness to change was positively affected by specialty, age, experience, and gender. However, participants' work settings and educational qualifications were not related to readiness to change. The need to stay at a high level of readiness for change is important in the age of agile organisations and competitiveness. In conclusion, future research may include research that uses a mixed-methods design. Finally, employees need to take an active approach to implementing the plan to enhance their perception of the ability to implement the change. This study also recommends that leaders need to be proactive in managing change by assessing the change readiness in their organisation and setting out plans to prepare the organisations, which can be done by using change management models such as the McKinsey 7-S Model and ADKAR Model.

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Author contribution

JA developed the conceptual framework. MA and AA developed the methodological design. JA contributed to data collection. JA and MA analysed the data and drafted the manuscript. All authors contributed to the final version of the study.

Conflict of interest

No conflict of interest in this study.

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