

Articles

- The Impact of Performance of Non-Nursing Tasks on the Attitudes of Nursing Students toward Nursing Profession
- The Pattern of Communication and Teamwork among Operating Theatre Personnel in a State of a Developing Country
- Quality of Clinical Nursing Education Programme in Ghana: Preceptors' Perspectives
- Factors Affecting the Quality of Life of Older People during the COVID-19 Pandemic
- Illuminating the Experience of Stigma among Persons Living with HIV using Participative Drawing Method
- Mediation Role of Perceived Organizational Support on Nurses' Work Engagement and Leadership Styles
- Patient Safety Competency and its Related Aspects in Professional Education among Nursing Students of Two Nursing Schools in Iran: A Comparative Study
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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

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INDEXING AND ABSTRACTING

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(<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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- Portal Garuda/Indonesian Publication Index (IPI);
(<http://id.portalgaruda.org/?ref=browse&mod=viewjournal&journal=1284>)
- Indonesian Scientific Journal Database (ISJD)
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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.

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The reference consists of all references used to write the manuscript and adhere to the APA 7th edition. Ensure that citations used are as contemporary as possible, including those from the current year of writing. Delete older literature citations (more than 10 years) unless these are central to your study. The number of references should be at least 50, and 80% of them should be from journal articles. References should avoid the use of secondary citations. Self-citations are allowed up to 20% of the total references.

4.5 Manuscript of case studies

4.5.1 Introduction

The introduction should explain the background of the case (the rarely found case), including the disorder or nursing problems and usual presentation and progression. It should also include a brief literature review that introduces the case report from the standpoint of those without specialist knowledge in the area. It should also end with a very brief statement of what is being reported in the article. The introduction should be clear, focused, concise, and attract the reader's attention and interest.

4.5.2 Case presentation

Provide a clear picture of the patient's condition and presentation, and it is best presented in chronological order with sufficient detail and explanation, including: (1) patient description (without providing details that could lead to the identification of the patient), (2) case history, (3) physical examination results, (4) results of pathological tests and other investigations, (5) treatment plan, (6) expected outcomes of the treatment plan, and (7) actual outcomes. The author should ensure that all the relevant details are included and unnecessary ones excluded.

4.5.3 Discussion

The discussion is a significant part of case reports and should start by expanding on what has been said in the introduction, focusing on why the case is noteworthy and the problem that it addresses. Discussion should contain major interpretations from the findings and results in comparison to previous studies. The significance of the findings and case presentation should be emphasized in this section against previous findings in the subject area. Also, this section should evaluate the patient case for accuracy, validity, and uniqueness and compare or contrast the case report with the published literature. Finally, the authors should briefly summarize the published literature with recent references.

4.5.4 Implication and limitations

Provide the implications/ recommendations for policies or practices, as well as the limitations of the review.

4.5.5 Conclusions

The conclusion should briefly give readers the key points covered in the case report. It should conclude the case report and how it adds value to the available information. Authors can give suggestions and recommendations to clinicians, teachers, or researchers.

4.5.6 Consent

Clearly state that the patient gave his informed consent for publication, and a statement indicating that should be clearly narrated in the report. In the case of the child, the parent or legal guardian should have consented instead, and if the child is a teenager (<18 years old), then both patient and his parent should have consented.

4.5.7 Acknowledgments

Briefly acknowledge research funders and any parties that contribute to the study.

4.5.8 Author contribution

We encourage authors to provide statements outlining their individual contributions or roles to the manuscript.

4.5.9 Conflict of interest

State whether there is a conflict of interest among authors.

4.5.10 Reference

The reference consists of all references used to write the manuscript and adhere to the APA 7th edition. Ensure that citations used are as contemporary as possible, including those from the current year of writing. Delete older literature citations (more than 10 years) unless these are central to your study. The number of references should be at least 30, and 80% of them should be from journal articles. References should avoid the use of secondary citations. Self-citations are allowed up to 15% of the total references.

5. Tables

Every table is typed in 1 space. The number of tables is systematic as mentioned in the texts and completed with a short title each. Provide an explanation on the footnotes instead of on the title. Please explain on footnotes all non-standards information mentioned in the table. The total table should not be more than 6 tables.

6. Layout

The manuscript is to be written in A4 paper with a margin of at least 2.5 for each using Microsoft Word, Times New Roman font, and single-spaced. Each page is numbered starting from the title until the last page of the manuscript. Please check the text carefully before submission to check for correct content and typographic errors.

7. Word count

Manuscripts submitted to the journal should not exceed 7,000 words, including abstract and references. This word count excludes references for review manuscripts.

8. References

Authors are required to use reference management software in writing citations and references. Reference and citation use bracketed citation (name, year). Direct citation on references should include the page number of the citation. American Psychological Association 7th edition applies in writing the manuscript. See examples of referencing below:

8.1 Journal article

Grady, J. S., Her, M., Moreno, G., Perez, C., & Yelinek, J. (2019). Emotions in storybooks: A comparison of storybooks that represent ethnic and racial groups in the United States. *Psychology of Popular Media Culture*, 8(3), 207–217. <https://doi.org/10.1037/ppm0000185>

8.2 Journal article with an article number

Jerrentrup, A., Mueller, T., Glowalla, U., Herder, M., Henrichs, N., Neubauer, A., & Schaefer, J. R. (2018). Teaching medicine with the help of “Dr. House.” *PLoS ONE*, 13(3), Article e0193972. <https://doi.org/10.1371/journal.pone.0193972>

8.3 Whole authored book

Jackson, L. M. (2019). *The psychology of prejudice: From attitudes to social action* (2nd ed.). American Psychological Association. <https://doi.org/10.1037/0000168-000>

8.4 Whole edited book

Kesharwani, P. (Ed.). (2020). *Nanotechnology based approaches for tuberculosis treatment*. Academic Press.

8.5 Report by a government agency references

National Cancer Institute. (2019). *Taking time: Support for people with cancer* (NIH Publication No. 18-2059). U.S. Department of Health and Human Services, National Institutes of Health. <https://www.cancer.gov/publications/patient-education/takingtime.pdf>

8.6 Conference proceedings published in a journal

Duckworth, A. L., Quirk, A., Gallop, R., Hoyle, R. H., Kelly, D. R., & Matthews, M. D. (2019). Cognitive and noncognitive predictors of success. *Proceedings of the National Academy of Sciences, USA*, 116(47), 23499–23504. <https://doi.org/10.1073/pnas.1910510116>

8.7 Conference proceedings published as a whole book

Kushilevitz, E., & Malkin, T. (Eds.). (2016). *Lecture notes in computer science: Vol. 9562. Theory of cryptography*. Springer. <https://doi.org/10.1007/978-3-662-49096-9>

8.8 Published dissertation or thesis references

Kabir, J. M. (2016). *Factors influencing customer satisfaction at a fast food hamburger chain: The relationship between customer satisfaction and customer loyalty* (Publication No. 10169573) [Doctoral dissertation, Wilmington University]. ProQuest Dissertations & Theses Global.

8.9 Unpublished dissertation or thesis references

Harris, L. (2014). *Instructional leadership perceptions and practices of elementary school leaders* [Unpublished doctoral dissertation]. University of Virginia

9. Screening for plagiarism

The journal applies the policy of screening for plagiarism. All articles in this publication are original: the content (either in full or in part) in each article has not been knowingly republished without specific citation to the original release. A Turnitin plagiarism checker is applied to all submitted papers during initial screening. The journal accepts a maximum similarity index of 20%. Papers leading to plagiarism or self-plagiarism will be immediately rejected.

10. Author fee

All authors should pay for article processing charges (APC) when the manuscript is editorially accepted for publication. The APC is IDR. 2,000,000 (for Indonesian authors) or USD 130 (for non-Indonesian authors). The payment can be made by bank transfer/Paypal. Information regarding the bank/Paypal account is sent via email to the corresponding author.

11. Authorship and changes to authorship

All authors should have made substantial contributions to the manuscript, including (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

Authors should carefully consider the list and order of authors before submitting their manuscripts. Any addition, deletion, or rearrangement of author names should be made only before the manuscript has been accepted and only if approved by the journal editor.

12. Reporting Guidelines

The reporting guidelines endorsed by the journal are listed below:

- Observational cohort, case-control, and cross-sectional studies – STROBE (Strengthening the Reporting of Observational Studies in Epidemiology), <http://www.equator-network.org/reporting-guidelines/strobe/>
- Qualitative studies – COREQ (Consolidated criteria for reporting qualitative research), <http://www.equator-network.org/reporting-guidelines/coreq>
- Quasi-experimental/non-randomized evaluations – TREND (Transparent Reporting of Evaluations with Non-randomized Designs), <http://www.cdc.gov/trendstatement/>
- Randomized (and quasi-randomized) controlled trials – CONSORT (Consolidated Standards of Reporting Trials), <http://www.equator-network.org/reporting-guidelines/consort/>
- Study of diagnostic accuracy/assessment scale – STARD (Standards for the Reporting of Diagnostic Accuracy Studies), <http://www.equator-network.org/reporting-guidelines/stard/>
- Systematic review of controlled trials – PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), <http://www.equator-network.org/reporting-guidelines/prisma/>
- Systematic review of observational studies – MOOSE (Meta-analysis of Observational Studies in Epidemiology), <http://www.ncbi.nlm.nih.gov/pubmed/10789670>
- Case reports – CASE (Case Report Guidelines), <https://www.care-statement.org/>

13. Submission

Each submitted manuscript must conform to the Instructions to Authors and should be submitted online at <http://ejournal.undip.ac.id/medianers>. The instructions for registering, submission, and revision are provided on the website. If any difficulties are found, authors can contact the editorial office via email: media_ners@live.undip.ac.id.

The author should first register as an author and/or is offered as a reviewer through the following address:

<http://ejournal.undip.ac.id/index.php/medianers/about/submissions#onlineSubmissions>

The author should fulfill the form as detailed as possible where the star-marked form must be entered. After all forms of textbox were filled, the author clicks on the "Register" button to proceed with the registration. Therefore, the author is brought to an online author submission interface where the author should click on "New Submission." In the Start of a New Submission section, click on "'Click Here': to go to step one of the five-step submission process."

The following are five steps in the online submission process:

1. *Step 1 - Starting the Submission:* Select the appropriate section of the journal, i.e., Original Research Articles, Review Article, or Case Report. Thus, the author must check-mark on the submission checklists. The author may type or copy-paste the Covering Letter in Letter to Editor.
2. *Step 2 – Uploading the Submission:* To upload a manuscript to this journal, click Browse on the Upload submission file item and choose the manuscript document file (.doc/.docx) to be submitted; then, click the "Upload" button until the file has been uploaded.

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ORIGINAL RESEARCH

The Impact of Performance of Non-Nursing Tasks on the Attitudes of Nursing Students toward Nursing Profession



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Article Info	Abstract
<p>Article History: Received: 4 March 2022 Revised: 17 June 2022 Accepted: 22 June 2022 Online: 31 August 2022</p> <p>Keywords: Jordan; nursing profession; nursing students; registered nurses</p> <p>Corresponding Author: Ibrahim Rawhi Ayasreh Department of Adult Nursing, Faculty of Nursing, Jerash University, Jordan Email: i.ayasreh@gmail.com ibrahim.ayasrah@jpu.edu.jo</p>	<p>Background: Performing non-nursing tasks (NNTs) by registered nurses is considered as one of the most challenging issues faced by nursing sector worldwide. The negative impacts of nurses' engagement in NNTs were not limited to nurses or clients, but also nursing students who train in clinical areas. Performance of NNTs is found to aggravate nurses' confusion about their professional roles and identity. However, the impact of performance of NNTs on nursing students has not been yet studied.</p> <p>Purpose: This study aimed to investigate the impact of witnessing performance of non-nursing tasks by registered nurses on nursing students' attitudes toward the nursing profession.</p> <p>Methods: A descriptive comparative study was conducted from September 2021 to January 2022. A convenience sampling was used and 409 valid questionnaires were obtained from Jordanian nursing students who were at least in their second academic year and had completed at least one clinical training period in one of the clinical settings. Attitude Scale for Nursing Profession was used to explore the participants' attitudes toward the nursing profession. Descriptive statistics and independent t-test test were used for data analysis.</p> <p>Results: The results revealed that approximately 48% of the participants witnessed performance of NNTs by registered nurses during their clinical training. Student participants who witnessed performance of NNTs ($M=154.4$, $SD=17.5$) showed significantly less positive attitude toward the nursing profession than those who did not witness ($M=157.4$, $SD=12.2$), $t(407)=-2.03$, $p=0.007$.</p> <p>Conclusion: Around half of student participants witnessed performance of NNTs by registered nurses during clinical training. Performance of NNTs had a significant effect on nursing students' attitudes toward nursing profession. Appropriate measures should be prior to clinical training to enhance nurse students' awareness about professional scope of nursing profession.</p>

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1. Introduction

Performing non-nursing tasks (NNTs) by registered nurses is considered as one of the most challenging issues faced by nursing sector worldwide (Hammad et al., 2021). Registered nurses' engagement in NNTs is the focus of many previous studies in which NNT is defined as any action that registered nurses perform out of scope of nursing practice (Palese et al., 2019), and/or not related to direct client's care (Bekker et al., 2015; Hammad et al., 2021). Such NNTs include - but are not limited to - clerical tasks, delivering or retrieving food trays, transferring stable patients (Grosso et al., 2019), supply and order management, cleaning clients' rooms (Bekker et al., 2018), and answering phone calls (Palese et al., 2019). Grosso et al. (2019) conducted a qualitative study to explore NNTs as experienced by nurses and found that NNTs involve three categories of activities: those that require less education (such as those performed by healthcare assistant), those that require same level of education (such as those performed by physiotherapists), and those that requires higher education as compared to nurses (such as those performed by physicians).

Carrying out duties outside the job description of registered nurses has been found to have deleterious effects on the public reputation of nursing profession and the quality of care provided to clients (Park & Hwang, 2021). In a study conducted by Bekker et al. (2015), a positive

relationship was found between performing NNTs and leaving important nursing tasks undone. This means that nurses waste their valuable time and efforts in doing unnecessary non-nursing activities at the expense of nursing caring intervention and duties. Consequently, nurses become liable to negligence and malpractice, particularly in terms of clients' education, surveying, and monitoring (Ahmed et al., 2020; Grosso et al., 2019). At the individual level, it has been found that nurses reported decreased feelings of independence and resilience (Bekker et al., 2015), increased level of emotional distress and frustration, and therefore, decreased satisfaction with nursing job (Ahmed et al., 2020; Grosso et al., 2019). Another study conducted by Kang et al. (2016) revealed that performing NNTs by registered nurses poses a great threat to client's safety, as it increases the risk of patient's adverse event, particularly in terms of hospital-acquired infections, bedsores, inappropriate administration of medications, and falls.

The negative impact of nurses' engagement in NNTs might not be limited to nurses or clients, but also nurse students who train in clinical areas. A recent study conducted by Palese et al. (2019) on nursing students, who witness nurses' performance of NNTs, found that nursing students experienced a conflict between what those students learned during their study course and what nurses actually perform. Furthermore, nursing students perceived practicing non-nursing practices as a threat to their learning opportunities of ideal conception and identity of nursing profession (Palese et al., 2019). Therefore, many previous studies recommended developing appropriate support measures in forms of preparatory pre-clinical courses to promote the awareness of nursing students about the nursing profession, and to correct their misconceptions regarding nursing care interventions (Ayasreh & Khalaf, 2020; Rokhafrooz et al., 2022). However, it has been suggested that effectiveness of these pre-clinical courses might be maximized if they are based on the views and misconceptions of nurse students toward nursing profession.

This study was conducted in Jordan, which is considered as one of the main destinations for therapeutic tourism in the Middle East, and this is attributed to possessing of high quality medical and health technologies, in addition to highly competent well-qualified medical and nursing personnel (Anshasi & Alsyouf, 2020). However, According to the Global Health Observatory of World Health Organization (2022), the ratio of nursing and midwifery personnel per 10,000 of Jordan population was 33.9, which is lower than world average. These statistics highlight the problem of low employment rate of nurses in Jordan, particularly in governmental hospitals, which have worsened by inefficient geographical distribution of nursing personnel and high rate of Jordanian nurses' migration (AbuAlRub et al., 2016). Accordingly, and due to scarcity of empirically based research studying the phenomenon of NNTs at the local level, this study was aimed to investigate the impact of witnessing performance of non-nursing tasks by registered nurses on the nursing students' attitudes toward the nursing profession.

2. Methods

2.1 Research design

A descriptive comparative design was used. This design is appropriate as this study addresses the comparison between the views of nursing students who witnessed performance of NNTs by registered nurses during their practical training and those who did not witness (Polit & Beck, 2021).

2.2 Setting and samples

This study employed convenience sampling strategy to select a sample of nursing students from six Jordanian governmental and private nursing schools that provide a four-year baccalaureate nursing program. These schools were distributed over all regions of Jordan: The North, The Middle, and The South. The number of nursing students in these schools ranged from 350 to 1500 distributed over all academic years. The clinical part of curriculum in these schools form approximately 45% of total credit hours, with taking in consideration that clinical training begins usually from the second academic year. Based on the inclusion criteria, nurse students who completed their first academic year and had clinically trained in one of health care settings, were selected. Students who were enrolled in studying nursing through bridging program and working in health care institutes at the time of data collection were excluded. G*Power (version 3.1.9.4) was used to estimate the required sample size based on significance level of 0.05, effect size of 0.50, and a power of 0.95. Accordingly, the calculated required minimum sample size for this

study was 210. However, a total of 500 questionnaires were distributed to eligible nursing students to overcome anticipated low response rate. The response rate was 81.8% (409 nurse students).

2.3 Measurement and data collection

A paper-based questionnaire was utilized for data collection in this study. Each questionnaire involved three sections. The researchers developed the first section that involves a number of items related to demographic information of the participants. These demographic data included age, gender, type of university, current academic level, the most frequent kind of hospital where they clinically trained, and whether they have witnessed registered nurses' performance of NNTs during their clinical training.

The second section was adopted from N4CAST survey (Sermeus et al., 2011) to elicit data about nurses' performance of NNTs. This part consists of seven items which were "Answering phone calls and clerical works", "Transporting of patients within hospital", "Arranging discharge referrals and transportation", "Cleaning patients' room and equipment", "Performing non-nursing care", "Obtaining supplies or equipment", "Delivering and retrieving food trays". Each participant was asked to rate each item based on a 3-point Likert scale as following: never (1), sometimes (2), and often (3). The total score ranged between 7-21.

Regarding the third section of questionnaire, the researcher adopted the Attitude Scale for Nursing Profession (ASNP) which was originally designed by Coban and Kasikci (2011). This tool involves 40 items. The participants were asked to rate each item based on five-point Likert scale according to the degree of agreement as following: "1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree". According to Coban and Kasikci's (2011) recommendations for ASNP use, a total score above 120 point indicates a positive attitude toward the nursing profession. The reliability of ASNP have been established by its original authors and showed high reliability ($\alpha=0.90$, $p<0.001$).

After the approval from the original authors has been obtained to use, modify, and translate ASNP and NNTs research instruments, the researchers followed the guidelines of world health organization (WHO, 2022) for adopting and translating research tools. Firstly, one of the healthcare providers who has good English language translated the original instrument to Arabic. Then, a bilingual academician who has extensive expertise in scientific research checked the translated instrument for adequacy, conceptual correspondence, and any missing concepts or expressions. After that, an expert in English language back translated the Arabic version of ASNP and NNTs research instruments to English, and no major discrepancies were revealed between both versions.

In order to check the suitability and psychometric properties of the Arabic version of ASNP and NNTs research instruments, the researchers conducted a pilot study recruiting 25 nursing students who met the inclusion criteria. Accordingly, the participants in pilot study revealed that the questionnaire was easily comprehensible, easy to read, and an average of 11 minutes of time was needed to answer the questionnaire. Reliability statistical analysis was performed and showed that Cronbach alpha was 0.83 for ASNP, and 0.81 for NNTs research instrument, which indicated that both research instruments have a good internal consistency.

After obtaining the approval of research ethical committees of Jerash University and the targeted nursing schools, the primary researcher, with assistance of a number of faculties in the targeted universities, approached the potential student participants and explained the nature, purpose, and benefits of the study. Then, each participant was given a copy of the questionnaire along with an envelope, and he/she asked to fill all items and submit it to the primary researcher after completing the questionnaire.

2.4 Data analysis

The researchers used SPSS 22.0 (IBM Corp., Armonk, N.Y., USA) to analyze data. Means, standard deviations (SD), frequencies, and percentages were computed to describe data related to participants' demographic, participants' witnessing of performance of NNTs by registered nurses, and participants' views on the nursing profession. A two-tailed independent t-test was utilized to detect if there are any differences in student participants' views on the nursing profession based on their witnessing performance of NNTs by registered nurses during clinical training.

2.5 Ethical considerations

The study protocol was approved by the Institutional Review Board (IRB), Faculty of Nursing, Jerash University, Jerash, Jordan (Code number: ABR 9-20-21). Furthermore, the researchers informed the eligible participants about their rights of voluntarily participation, withdraw at any time, confidentiality, and privacy. Nursing students who agreed to participate were asked to sign the consent form. In order to maintain anonymity, all study participants were asked not to write their names and academic numbers or any other identifying information on the questionnaires. Additionally, participants were informed that all completed questionnaires will be placed in a locker in the researcher's office over the study period, to maintain the confidentiality.

3. Results

3.1 Participants' characteristics and experiences

A total of 409 nurse students participated in this study. The mean age of them was 21.1 years old. About 60% of student participants were female. One hundred and sixty-three participants (39.9%) were in their fourth academic year. About 57% of student participants were from private universities. More than three-quarters of the participants have trained in governmental hospitals. One hundred and ninety-six (47.9%) nursing students reported witnessing performance of NNTs by registered nurses during their clinical training.

3.2 Descriptive data on NNTs

The results of this study revealed that the most commonly NNTs performed by registered nurses was "Answering phone calls and clerical tasks" (M=2.34). The complete list of NNTs were shown in Table 1 in a descending order based on the frequency of occurrence.

Table 1. Descriptive data on NNTs (n=196)

Item	Mean	SD
Answering phone calls and clerical works	2.34	0.664
Transporting of patients within hospital	2.23	0.637
Arranging discharge referrals and transportation	2.09	0.752
Cleaning patients' room and equipment	1.91	0.729
Performing non-nursing care	1.91	0.763
Obtaining supplies or equipment	1.83	0.692
Delivering and retrieving food trays	1.67	0.684

3.3 Attitudes of participants who did not witness performance of NNTs

The results demonstrated that the average total score of student participants who did not witness performance of NNTs on ASNP tool was 157. This indicates that participants had a positive attitude toward the nursing profession (>120). Regarding ASNP items, the item of "I think nurses are indispensable members of the health staff" was rated in the top position by student participants with a mean score of 4.79 out of 5. On the other hand, the item "Nursing is a not considered as an exhausting profession" was rated in the last position with a mean score of 1.05 out of 5. The top and least five items as rated by student participants who did not witness performance of NNTs by registered nurses were shown in Table 2.

3.4 Attitudes of participants who witnessed performance of NNTs

The results of this study demonstrated that the average total score for student participants who witnessed performance of NNTs on ASNP tool was 154. This indicates that participants had a positive attitude toward the nursing profession (>120). Regarding ASNP items, the item of "Nursing requires a lot of patience" was rated first by student participants with a mean score of 4.73 out of 5. On the other hand, the item of "Nursing is a not considered as an exhausting profession" was rated in the last place with a mean score of 1.84 out of 5. The top and least five rated items as viewed by student participants who witnessed performance of NNTs were shown in Table 3.

Table 2. The top and the least five ASNP items as perceived by participants who did not witness performance of NNTs by registered nurses (n = 213)

The Top Five Ranked Items			The Least Five Ranked Items		
Item	Mean	SD	Item	Mean	SD
"I think nurses are indispensable members of the health staff"	4.79	0.439	"Nursing is a not considered as an exhausting profession"	1.35	1.051
"I think nursing profession is an indispensable profession for a society"	4.77	0.454	"I think nursing is a cheerful profession"	1.97	1.145
"Nurses should be compassionate"	4.73	0.522	"Nursing can be practiced only by enthusiasm"	2.00	0.847
"Nursing is a profession which requires skills besides knowledge"	4.71	0.453	"I would like my children to become nurses"	2.05	1.308
"I think nurses among all health care personnel communicate the most with patients"	4.63	0.589	"Nursing is preferred as a profession unless I have other choices left"	2.39	1.066

Table 3. The top and the least five ASNP items as perceived by participants who witnessed performance of NNTs by registered nurses (n= 196)

The Top Five Ranked Items			The Least Five Ranked Items		
Item	Mean	SD	Item	Mean	SD
"Nursing requires a lot of patience"	4.73	0.602	"Nursing is a not considered as an exhausting profession"	1.84	1.370
"I think nurses are indispensable members of the health staff"	4.72	0.589	"I think nursing profession has reached the state it deserves"	2.11	1.500
"I think nurses among all health care personnel communicate the most with patients"	4.68	0.666	"Nursing is preferred as a profession unless I have other choices left"	2.40	1.174
"I think nursing profession is an indispensable profession for a society"	4.67	0.691	"I would like my children to become nurses"	2.42	1.071
"Nursing is a profession which requires skills besides knowledge"	4.67	0.676	"I think nursing is a cheerful profession"	2.60	1.017

3.5 Differences in attitudes based on witnessing performance of NNTs

The results of this study demonstrated that student participants who witnessed performance of NNTs had significantly lower mean scores on ASNP scale than student participants who did not witness (Table 4). On the other hand, no significant differences were found among student participants who witnessed performance of NNTs by registered nurses based on their demographic characteristics (Table 5).

Table 4. The comparison of the attitudes of nursing students who witnessed and who did not witness performance of NNTs by registered nurses (n=409)

	Nursing students who witnessed performance of NNTs (n=196)		Nursing students who did not witness performance of NNTs (n=213)		t-test
	Mean	SD	Mean	SD	
Attitudes toward the nursing profession	154.35	17.469	157.35	12.163	-2.028**

* NNTs: Non-Nursing Tasks; ** $p < 0.05$

Table 5. The comparison of ASNP scores based on demographic characteristics of participants who witness performance of NNTs (n=196)

Characteristic	f(%)	F/t	p	Mean	SD
Gender		-2.00	0.088		
Female	99 (50.5)			154.2	20.5
Male	97 (49.5)			150.3	14.7
Type of University		1.89	0.075		
Governmental	81 (41.3)			158.1	19.1
Private	115 (58.7)			155.8	16.2
Academic Year		3.32	0.102		
2nd year	50 (25.5)			153.5	24.2
3rd year	43 (21.9)			154.8	20.3
4th year	103 (52.6)			157.4	13.2
Training site		-1.79	0.081		
Governmental Hospitals	131 (66.8)			152.8	19.0
Private Hospitals	65 (33.2)			157.5	13.4

4. Discussion

The aim of this study was to investigate the impact of witnessing performance of non-nursing tasks by registered nurses on nursing students' attitudes toward the nursing profession. Approximately half of student participants in the current study revealed that they have witnessed performance of NNTs by registered nurses during their clinical training. This disquieting prevalence of NNTs might be stemmed from the inadequate support services particularly in public hospitals in Jordan, which might compel registered nurses to engage in activities out of the scope of the nursing practice. On the other hand, although the prevalence rate of NNTs among registered nurses sounds alarming, it is lower than previously reported in recent study carried out by Grosso et al. (2019) who demonstrated that 94.5% of registered nurses performed NNTs. The relatively lower prevalence of NNTs in the current study in comparison to previous studies, might be attributed to the limited awareness of nursing students of all nurses' activities in clinical areas, particularly in areas where students' training is uncommon such as outpatient departments.

In line with many previous studies (Bekker et al., 2015; Kearney et al., 2016), the current study revealed that answering phones and clerical works and patients' transportation within hospitals were considered as the most commonly performed NNTs by registered nurses. These findings might be attributed mainly to labor resources, as indicated by a recent study conducted by Al-Faouri et al. (2020) which revealed that inadequacy of clerical employees, patient transporters, and other assistive staff has a significant contribution to high prevalence of performing NNTs by registered nurses and high level of missed nursing care (Al-Faouri et al., 2020). Furthermore, a conceptual study conducted by Freitas et al. (2022) revealed that answering phone calls was deemed as considerable contributing factor to the concept of "interruption in the work of nursing personnel" and was found to affect the attention and concentration of registered nurses during performing caring interventions to their clients, and thus increasing the frequency and severity of malpractice, negligence, and medications errors.

Transporting clients in the hospitals was perceived as the second most frequent NNTs which were performed by registered nurses. This finding might be unsurprising, since that the registered nurses were actively participate in intrahospital transportation professional activities including planning, clients' preparation, equipment preparation, clients' evaluation and monitoring, and evaluation of intrahospital transportation process (Alamanou & Brokalaki, 2014; Khan et al., 2021). Many previous studies found that engagement of well-prepared and experienced nurses in intrahospital client's transportation process, had a significant contribution in preventing many life-threatening complications and events (Sharafi et al., 2020). However, and due to the shortage of porters and other assistive staff, registered nurses in Jordan tend to directly transport and move clients through the hallways in the hospitals, and this might adversely affect time and efforts

allocated to professional aspects of clients' transportation such as clients' preparation and monitoring.

The findings of the current study showed that student participants who did not witness performance of NNTs by registered nurses had significantly more positive attitudes toward the nursing profession than those who witnessed performance of NNTs. However, the overall attitudes of both groups were positive. This was consistent with the results of prior studies (Ayasreh & Khalaf, 2020; Sorio & Hatamleh, 2017). Participating nursing students in the current study placed high value on nursing profession and nurses' contribution in health care processes, and this was apparent in the study's findings as both groups of nursing students perceived nursing profession as indispensable profession for a society. This is consistent with the findings of a recent study carried out by Ayasreh and Khalaf (2020). This might be ascribed to the distinctive dynamic attribute of nursing job which demands from nurses to be on the direct encounter and spend longer times with the clients (Berlanda et al., 2019; Kim, 2020).

5. Implications and limitations

Performance of non-nursing tasks was shown to have a negative impact on how nursing students view nursing profession. Therefore, it is recommended to enhance nursing students' preparedness to the clinical training in health care institutes, through provision of orientation programs about nursing tasks and how these tasks are distinguished from physicians', other health care providers', and service workers' tasks. Furthermore, it is recommended that nurse managers adopt or develop strategies for monitoring nurses' activities, and to reallocate nurses' efforts and time to nursing caring tasks to decrease the rates of missed nursing care and improve clients' outcomes.

The main limitation of this study was the use of convenience sampling technique. Use of nonprobability sampling does not guarantee that all characteristics of participants were well distributed in both groups. However, there was great practical difficulty to employ random sampling technique for recruiting study sample. Despite the limitation, this study is the first research work that highlighted the relationship between performance of non-nursing tasks and nursing students' attitudes toward nursing profession. Furthermore, this study highlighted nursing student' viewpoints, up on which both academic and professional nursing authorities should act to improve nursing students' professional identity and loyalty.

6. Conclusion

Around half of student participants witnessed performance of NNTs by registered nurses during clinical training. Performance of NNTs had a significant effect on nursing students' attitudes toward nursing profession. Appropriate measures should be prior to clinical training to enhance nurse students' awareness about professional scope of nursing profession. Further research, particularly qualitative research is recommended, to understand the contextual factors and consequences of non-nursing tasks as experienced by both nursing staff and nursing students.

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Author contribution

IA: Conceptualization, Methodology, formal analysis.

FH: Writing, reviewing, and editing.

RAA: Investigation, validation.

Conflict of interest

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

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ORIGINAL RESEARCH

The Pattern of Communication and Teamwork among Operating Theatre Personnel in a State of a Developing Country



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Article Info	Abstract
<p>Article History: Received: 24 April 2022 Revised: 29 July 2022 Accepted: 2 August 2022 Online: 31 August 2022</p> <p>Keywords: Communication; Nigeria; operating theatre; pattern; teamwork</p> <p>Corresponding Author: Olufemi Oyebanji Oyediran Lecturer, Department of Nursing Science, Obafemi Awolowo University, Ile-Ife, Nigeria Email: phemyoyediran@gmail.com</p>	<p>Background: Effective communication and teamwork is increasingly recognized as an important mechanism for enhancing the safety of healthcare. However, there is dearth of study on the pattern of communication among surgeons, nurses and anaesthetists in South Western part of Nigeria</p> <p>Purpose: This study assessed the patterns of communication and teamwork among operating theatre personnel and also identified barriers to communication and teamwork in the operating theatre in selected hospitals in Lagos State, Nigeria.</p> <p>Methods: A descriptive research design was adopted and a convenience sampling technique was used to select 215 nurse and doctor respondents for the study. With a 53-item self-developed structured questionnaire, data were collected. Results were presented descriptively (frequency tables and bar charts), and inferential statistics (Chi-square) were used to test the hypotheses.</p> <p>Results: Results revealed that 41.9% of the respondents had a fair knowledge of communication and teamwork in the operating theatre. Respondents described their pattern of communication as follows; the majority (99.5%) of the respondents communicate through written, spoken words or visual media, and 99.1% also communicate with other theatre personnel irrespective of their hierarchies. In addition, 90.7% reported that upward communication from patients to surgical team members is common in the theatre, while 87% submitted that they communicate through telephone conversations in this theatre. Individual bias, pressure to complete work, workload, poor leadership/lackadaisical attitudes and conflict of interest were identified as barriers to communication and teamwork in the operating theatre.</p> <p>Conclusion: The study concluded that the majority of theatre personnel lack adequate knowledge of communication and teamwork in the operating room. Hence, there is a need for periodic training for operating personnel to improve communication and teamwork, and surgical outcomes.</p>

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1. Introduction

Interdisciplinary understanding in surgical teams has been broadly researched for years due to stakeholders' concern for the contributions of human factors to patient safety in the operating theatre milieu. Of particular interest has been how the quality, effectiveness, and outcomes of surgical procedures are affected by communication and how attitudes toward teamwork impact the quality and efficiency of surgical interventions (Gardesi et al., 2009). It is evident that although a surgery depends on the technical expertise of the surgeon, the operation itself is a social situation where many tasks that are important for safety in surgery are accomplished through communication and teamwork between the team members. The success of surgical procedures and the safety of surgical patients are dependent on high-quality communication and shared knowledge. This task is challenging to accomplish due to the surgical framework's interrelationship, time constraints, and ambiguity. Surgical team members need not only the clinical knowledge and technical know-how but also the skills to engage in collaboration, understand the complexity of the clinical situation, make apt decisions, and act proficiently (Gardesi et al., 2009).

The perioperative setting is fast-paced and production-driven, pressing time limits and highly sophisticated procedures promote surgical blunders, and these errors significantly contribute to patient harm and death (Penprase et al., 2010). It is well documented that patient safety is boosted when healthcare professionals function as an efficient team. According to Frankel et al. (2007), effective teamwork and well-organized communication skills are the bedrock of safe, reliable, and high-quality healthcare services and when deep-rooted into the daily routine; it improves staff and patient satisfaction while at the same time boosting optimal clinical care outcomes.

It is estimated that about 234 million surgical procedures are performed annually. In developed nations, where 73.6 percent of procedures occur, 3-16 % end in morbidity, and 0.4-0.8 % are fatal (Rose et al., 2015). The majority of surgical errors contributing to morbidity and mortality can be attributed to poor communication and teamwork breakdown. The World Health Organization further reported that problems associated with surgical safety in developed countries account for half of the preventable adverse events that result in loss of life or disability (Domer et al., 2021).

A retrospective appraisal of 16,000 in-hospital deaths found that communication mistakes were twice as frequent as errors due to inadequate clinical expertise (Wilson et al., 1995). A comparative study of primary care physicians suggested that nearly 50% of all detected adverse events were linked to communication problems (Lang et al., 2016). Another previous study stated that communication and teamwork contributed to 43% of errors made in surgery (Ramadanov, 2020). Taken together, teamwork and communication breakdowns were linked with degraded team performance. Hence, they constitute a vital component of good practice and are imperative for safety in surgery (Tørring et al., 2019).

In the United Kingdom, over eight million surgeries were carried out in 2004 alone (more than one operation for every seven inhabitants), with a mortality rate estimated at 20,000 to 25,000 patients (Cain & Ackland, 2013). A survey conducted in Scotland revealed that consultant surgeons expect their trainees to possess a variety of technical skills and important aspects such as application of knowledge, communication and teamwork (Rosen et al., 2018). This establish the fact that most surgical errors even in the developed countries of the world can be prevented with effective communication and good teamwork. Around the world, one million patients die, and seven million are injured due to surgical-related complications yearly (Weiser & Gawande, 2015). In South Africa, a study was conducted to observe communication flow in the operating theatre, and it was concluded that safe and successful surgery demands clear lines of communication, and the most used method for communication is face-to-face to establish that message is well understood (Van As et al., 2011).

Communication plays a crucially important and complex role in the operating theatre. It is shaped by organizational culture, and non-verbal resources are just as relevant for effective communication. The tacit knowledge/skills underlying the use of non-verbal communication could be examined by observing practitioners at work (van den Oever & Schraaggen (2021). On the other side, failure of communication within surgical team leads to failure to share vital information with the team, failure to request information from others, or direct information to a particular member of the team and also failure to include patients and their families in communication involving their care. This will be translated to poor documentation, that is not timed, nonspecific, and incomplete and failure to seek input from the surgical patients with subsequent poor surgical outcome and preventable surgical complications (Levinson et al., 2013).

Weiser et al. (2010) observed cases of medical malpractice in surgery, and found that around 70% of adverse events were a result of poor team-communication. In operating theatres, team structure is ambiguous, where surgeons, nurses and anaesthetists may not see themselves as part of one team but three different teams. This affect co-ordination and more importantly prevent the team from communicating effectively and this may lead to conflicting assumptions about how work is distributed and coordinated across the team leading to preventable errors. Also, in a study conducted in Nigeria by Fajemilehin et al. (2016) on safety practices employed by perioperative nurse practitioners in selected tertiary hospitals in south western Nigeria, it was revealed that growing attention is being focused on the safety of surgical patients and quality of surgical care. The authors further submitted that fifty percent of all preventable surgery-related iatrogenic complications have been linked with the interruption in communication, ineffective teamwork, and non-adherence of the surgical team to standard practice regarding sterilization, aseptic technique, and prevention of wrong patient and site. Studies have shown that failures in

communication and teamwork are the causes of 80% of adverse events in surgery like wrong sites, procedures, missing equipment, and delays in surgery.

Effective communication and teamwork are essential for safe, high-quality surgery. However, due to the complexity of surgery and team members with different professional knowledge and skills, some barriers may impede effective communication and teamwork among operating theatre personnel; these barriers include individual bias, language barriers, extreme emotions, lackadaisical attitudes, wrong timing of message, overloading of message, embarrassment and anxiety, status differences, time constraints, conflict of interest, fatigue, values and beliefs, information overload, ego, personal insecurity, stereotyping, noise and privacy (Ali, 2017).

Studies on communication and teamwork patterns among surgical team members are limited and have not been well documented in this part of the developing world despite the importance of such communication to effective team function and the socialization of novice professionals. Accordingly, the present study aimed to determine the patterns of communication among operating theatre personnel and identify barriers to effective communication and teamwork in the operating theatres in selected hospitals in Lagos State of Nigeria.

2. Methods

2.1 Research design

This study adopted a descriptive cross-sectional design to measure the patterns of communication and teamwork among operating theatre personnel in selected Lagos State hospitals.

2.2 Setting and samples

This study was conducted in June, 2021 at the operating theatres of three selected hospitals in Lagos state (Hospital A, B & C). Hospitals A and B are secondary health institutions, while hospital C is a tertiary health institution owned by the Lagos State Government in Nigeria. Hospital A theatre has 7 consultant surgeons, 30 residents, 8 anaesthetists and 14 perioperative nurses; Hospital B has 9 consultant surgeons, 31 residents, 9 anaesthetists and 12 perioperative nurses, and Hospital C theatre has 45 consultant surgeons, 120 residents, 18 anaesthetists and 67 perioperative nurses.

The total population for this study was 370 personnel while the target population for this study was professional operating theatre personnel: surgeons, perioperative nurses, and anaesthetists in the three selected hospitals. Inclusion criterion was being members of surgical team who had spent not less than six months in the theatre. Due to the nature of activity scheduling in the theatres, a convenience sampling technique was used to distribute the questionnaires to the respondents that participated in the study.

The sample size was calculated using the Taro Yamane formula from the three selected operating theatres, which was 194 (Sing & Masuku, 2014). The non-response rate of 10% was added to make approximately 215 respondents that the questionnaires administered on them. Samples were selected from the settings as follows: Hospital A: 5 consultant surgeons; 30 residents, 5 anaesthetists, and 15 perioperative nurses; Hospital B: 5 consultant surgeons, 30 residents, 5 anaesthetists and 15 perioperative nurses, and Hospital C: 10 consultant surgeons, 50 residents, 10 anaesthetists and 30 perioperative nurses.

2.3 Measurement and data collection

The instrument for data collection was developed by the researchers following an extensive literature review and was a self-administered questionnaire. It comprises four sections: section A explored respondents' socio-demographic characteristics with 7 questions; section B was a 10-item questionnaire that assessed the knowledge of communication and teamwork among operating theatre personnel. The specific knowledge variables were measured on a Yes/No points scale. One point was awarded for a correct response, while the incorrect response received no point. The minimum score was "0" and a maximum score was "10". Those who scored >7 of 10 points were considered as having 'good' knowledge; those that scored 5 to 7 of 10 points were graded as having 'fair' knowledge, while those that scored <5 of 10 points were graded as having 'poor' knowledge. Section C was on a three-point Likert scale (Agree, Not Sure and Disagree) that determined the patterns of communication among operating theatre personnel. Section D was a 20-item scale with a Yes/No option that identified the perceived respondents' barriers to

communication and teamwork in the Operating Theatre. One point was awarded for a Yes response, while a No response received no point. The minimum score was “0” and the maximum score was “20” points. The mean and standard deviation of the barriers was calculated.

The validity of the questionnaire was established through the face and content validity criteria with content validity index of 0.81. The questionnaire was given to four experts in the field of nursing, education, surgery and psychology to assess the relevance of the subject matter, its scope and the coverage of the study. The ambiguous question was reframed to suit the purpose of the study, while inappropriate words were deleted. The reliability of the instrument was ensured by using the test-retest method. The questionnaire was pretested among 20 Lagos Island Maternity Hospital operating theatre personnel. This relatively small number was used because it abut 10% of the sample size. The co-efficient reliability of 0.72 for each section was found reliable.

Preliminary visits were made to the selected hospitals. A letter of introduction from the Department of Nursing Science, Obafemi Awolowo University, Ile-Ife was given to the gate keeper for permission to access the health facility. Permission letters to collect data were obtained from the management of the hospitals and heads of the departments in charge of the operating theatres where data collection was done. Administration of the questionnaire was done during working day from 8 a.m. to 4 p.m. for a period of 2 weeks. Each facility was visited twice a week for the administration of questionnaires. The questionnaires were given to the surgical personnel during their break after completing first round of surgical procedures. Completed questionnaires were retrieved immediately.

2.4 Data analysis

The data collected was checked for completeness and accuracy before being inputted to Statistical Package for Social Sciences (SPSS) version 25 for analysis. Descriptive (tables, pie charts and bar charts) and inferential statistics were used to present the data. The hypothesis was at a significant level of $p \geq 0.05$ using Fisher exact and Chi-square tests.

2.5 Ethical considerations

Ethical approval for the study was obtained from the ethical review board of Lagos State University Teaching Hospital with a reference number of LSHSC/REC/VOL.II/92. A letter of introduction from the Department of Nursing Science, Obafemi Awolowo University, Ile-Ife, was given to the gatekeeper for permission to access the health facility. Permission letters to collect data were obtained from the management of the hospitals and heads of the departments in charge of the operating theatres where data collection was done; informed consent was obtained from all the respondents before administering the questionnaires. Respondents were politely informed of the purpose of the research and assured that inclusion in the study was out of personal volition. Anonymity was also maintained to enhance confidentiality.

3. Results

3.1 Socio-demographic characteristics of the respondents

Table 1 shows that the majority of the respondents were between the age of 40-49, with a mean age of 40.41(5.56). More than half (59.5%) are female, while 67% are surgeons. Most of them are Yoruba and are Christians by religion.

3.2 Knowledge of communication and teamwork

Table 2 shows that less than two-thirds (62.8%) of the respondents viewed communication as a dynamic process that involves the transmission and accurate reception of ideas accompanied by feedback to foster expected outcomes. About two-thirds (65.4%) confirmed that teamwork could be accomplished through interdependent collaboration, open communication and shared decision-making. The idea that communication and teamwork among surgical team members are needed to make appropriate decisions and act efficiently was agreed upon by 57.5% of the respondents. Finally, more than half of the respondents thought inter-professional communication and teamwork play an essential role in information transfer during surgery and are relevant to patient safety and communication. In addition, teamwork during surgery helps establish and maintain harmonious and productive relationships between health professionals and patients. However, 59.3% of the respondents believed communication and teamwork breakdown could lead to surgical errors.

Table 1. Socio-demographic characteristics of respondents (n=215)

Variables	Frequency (f)	Percentage (%)
Age as at last birthday: Mean(SD)=40.41(5.56)		
20-29	8	3.7
30-39	90	41.9
40-49	104	48.4
50 and above	13	6.0
Gender		
Male	128	59.5
Female	87	40.5
Profession		
Perioperative nurse	44	20.5
Anesthetist (Doctor)	19	8.8
Surgeon	144	67
Anesthetist (nurse)	8	3.7
Years of experience		
1-5	11	5.1
6-10	74	34.4
11-15	96	44.7
Above 15	34	15.8
Grade level		
Grade Level 08-10	23	10.7
Grade Level 12-14	155	72.1
Grade Level 15-17	37	17.2
Ethnicity		
Yoruba	165	76.7
Igbo	35	16.3
Others	15	7
Religion		
Christian	140	65.1
Muslim	75	34.9
Facility of Practice		
Hospital A	54	25.1
Hospital B	61	28.4
Hospital C	100	46.5

3.3 Summary of respondents' knowledge about communication and teamwork

Figure 1 shows that less than half of the respondents (41.9%) had a fair knowledge of communication and teamwork against 31.6% of the respondents with good knowledge of communication and teamwork, with 26.5% with poor knowledge of communication and teamwork.

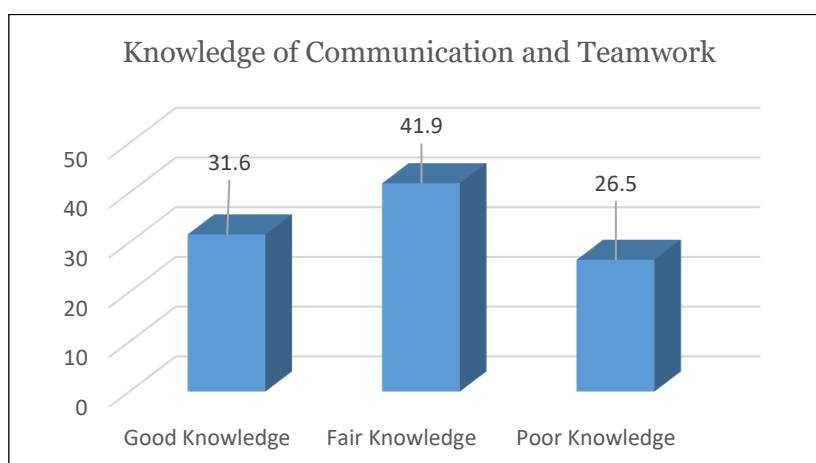
**Figure 1.** Knowledge of communication and teamwork

Table 2. Respondents' knowledge about communication and teamwork (n=215)

Items	Yes f(%)	No f(%)	Mean(SD)	Rank
Teamwork is a dynamic process involving two or more health professionals with skills and common health goals in assessing, planning and evaluating patient surgical care.	197(91.6)	18(8.4)	1.08(0.28)	1
Communication is a dynamic process that involves the transmission and accurate reception of ideas accompanied by feedback to foster expected outcomes.	195(91.6)	20(9.3)	1.09(0.29)	2
Communication does not take place unless there is an exchange of understanding of meaning.	145(67.4)	70(32.6)	1.33(0.47)	3
Effective communication must be candid, complete, concise, clear, concrete and courteous.	141(65.6)	74(34.4)	1.34(0.48)	4
Teamwork can be accomplished through interdependent collaboration, open communication and shared decision-making.	140(65.1)	75(34.9)	1.35(0.49)	5
Effective teamwork and communication skills are the cornerstones of safe, reliable, high-quality surgical care.	128(59.5)	87(40.5)	1.40(0.49)	6
Communication and teamwork breakdown can lead to surgical errors.	128(59.5)	87(40.5)	1.40(0.49)	7
Inter-professional communication and teamwork are essential in information transfer during surgery and are relevant to patient safety.	125(58.1)	90(41.9)	1.42(0.49)	8
Surgical team members need communication and teamwork to make appropriate decisions and act efficiently.	124(57.7)	91(42.3)	1.42(0.50)	9
Communication and teamwork during surgery helps establish and maintain harmonious and productive relationships between health professionals and patients.	123(57.2)	92(42.8)	1.43(0.50)	10

3.4 Patterns of communication among personnel in the operating theatre

Table 3 shows that a substantial number of the respondents (above 90%) declared that in their theatre, they communicate through written, spoken words or visual media; communication from patients to surgical team members is common, and communication flows regularly from surgical team members to patients; they routinely communicate with one another; they communicate with other theatre personnel irrespective of their hierarchies, also that surgical briefing is routinely done between team members before a surgical procedure and finally collective decision making. However, 78.1% of the respondents were also in agreement that they use body language, touch and paralanguage to communicate with other surgical team members and direct communication without a medium. Almost all (96.7%) of the respondents disagreed with often communicating with professional colleagues only in this theatre, while 93.5% also negated the idea of working alone in their domain. More so, 88.8% of the respondents denied partaking in teamwork with other personnel because it is time-consuming, while 92.6% attributed this to its energy-draining effects, and they could not depend on other professionals to facilitate their tasks (65.1%).

3.5 Barriers to communication and teamwork among operating theatre

Table 4 shows that the major barriers militating against effective communication and teamwork among operating theatre personnel include individual bias (92.6%), noise (83.3%), language barrier (77.7%), workload (88.8%), extreme emotions (80.5%), pressure to complete work (91.6%), status difference/hierarchy (76.7%), conflict of interest (84.2%), ego (78.1%), wrong timing of message (75.3%), inferiority complex (74.4%), overloading of the message (79.1%), poor Leadership/lackadaisical attitudes (87%), over competence (57.7%), over confidence (56.7%), differences in perception (77.2%), lack of trust (79.5%), cultural differences (74%), and lack of training (83.7%).

Table 3. Patterns of communication in the operating theatre (n=215)

Items	Agree f(%)	Not sure f(%)	Disagree f(%)	Mean(SD)	Rank
I communicate through written, spoken words or visual media in this theatre.	214(99.5)	1(0.5)	0(0.0)	1.00(0.7)	1
I communicate with other theatre personnel irrespective of their hierarchies.	213(99.1)	0(0)	2(0.9)	1.02(0.19)	2
Team members together frequently make decisions crucial to patient care.	210(97.7)	3(1.4)	2(0.9)	1.03(2.24)	3
Nurses, surgeons and anaesthetists routinely communicate with others in this theatre.	208(96.7)	0(0)	7(3.3)	1.07(0.36)	4
Communication flows regularly from surgical team members to patients in this theatre.	198(92.1)	13(6)	4(1.9)	1.10(0.31)	5
Upward communication from patients to surgical team members is common in this theatre.	195(90.7)	19(8.8)	1(0.5)	1.10(0.35)	6
A surgical briefing is routinely done between team members before a surgical procedure.	199(92.6)	4(1.9)	12(5.6)	1.13(0.48)	7
Telephone conversations aroused to communicate in this theatre.	187(87)	11(5.1)	17(7.9)	1.21(0.57)	8
Direct communication without a medium.	168(78.1)	41(19.1)	6(2.8)	1.25(0.49)	9
I use body language, touch and paralanguage to communicate with other members of the surgical team.	168(78.1)	27(12.6)	20(9.3)	1.31(0.63)	10
I depend on other professionals to facilitate my task.	69(32.1)	6(2.8)	140(65.1)	2.33(0.93)	11
I cannot partake in teamwork with other personnel because it is time-consuming.	19(8.8)	5(2.3)	191(88.8)	2.80(0.58)	12
I cannot partake in teamwork with other personnel because it is energy draining.	10(4.7)	6(2.8)	199(92.6)	2.88(0.44)	13
As a professional, I work in my domain only.	11(5.1)	3(1.4)	201(93.5)	2.88(0.45)	14
There is often communication among professional colleagues only in this theatre	6(2.8)	1(0.5)	208(96.7)	2.94(0.34)	15

Table 4. Barriers to communication and teamwork among the operating theatre personnel (n=215)

Items	Yes f(%)	No f(%)	Mean(SD)	Rank
Individual bias	199(92.6)	16(7.4)	1.07(0.26)	1
Pressure to complete work	197(91.6)	18(8.4)	1.08(0.28)	2
Workload	191(88.8)	24(11.2)	1.11(0.32)	3
Over competence	124(57.7)	91(42.3)	1.13(0.34)	4
Conflict of Interest	181(84.2)	34(15.8)	1.16(0.36)	5
Lack of training	180(83.7)	35(16.3)	1.16(0.37)	6
Noise	179(83.3)	36(16.7)	1.17(0.37)	7
Extreme emotions	173(80.5)	42(19.5)	1.20(0.38)	8
Lack of trust	171(79.5)	44(20.5)	1.20(0.40)	9
Overloading of message	170(79.1)	45(20.9)	1.21(0.41)	10
Ego	168(78.1)	47(21.9)	1.22(0.41)	11

Table 4. Continued

Items	Yes f(%)	No f(%)	Mean(SD)	Rank
Language barrier	167(77.7)	48(22.3)	1.22(0.42)	12
Differences in perception	166(77.2)	49(22.8)	1.23(0.42)	13
Status difference/Hierarchy	165(76.7)	50(23.3)	1.23(0.43)	14
Wrong timing of the message	162(75.3)	53(24.7)	1.25(0.43)	15
Inferiority complex	160(74.4)	55(25.6)	1.26(0.43)	16
Cultural differences	159(74)	56(26)	1.26(0.44)	17
Over competence	124(57.7)	91(42.3)	1.42(0.49)	18
Over confidence	122(56.7)	93(43.3)	1.43(0.50)	19
Masks	71(33)	144(67)	1.67(0.47)	20

As shown in Table 5, none of the socio-demographic characteristics predicted knowledge of communication and teamwork.

Table 5. Correlation analysis of socio-demographic characteristics and knowledge of communication and teamwork

Variables	Knowledge of Communication			χ^2	<i>p-value</i>
	Poor Knowledge	Fair Knowledge	Good Knowledge		
Age as at last birthday					
20-29	2(40.0)	2(40.0)	1(20.0)	2.42	0.87
30-39	31(34.4)	33(36.7)	26(28.9)		
40-49	32(29.4)	49(45.0)	28(25.7)		
50 and above	3(27.3)	6(54.5)	2(18.2)		
Gender					
Male	18(20.7)	39(44.8)	30(34.5)	0.66	0.71
Female	26(20.3)	64(50.0)	38(29.7)		
Profession					
Perioperative nurse	7(29.2)	10(41.7)	7(29.2)	4.80	0.56
Anesthetist (doctor)	8(42.1)	7(36.8)	4(21.1)		
Surgeon	52(31.7)	67(40.9)	45(27.4)		
Anesthetist (nurse)	1(12.5)	6(75.0)	1(12.5)		
Years of experience					
1-5	4(36.4)	4(36.4)	3(27.3)	1.59	0.95
6-10	29(30.2)	40(41.7)	27(28.1)		
11-15	25(33.8)	29(39.2)	20(27.0)		
Above 15	10(29.4)	17(50.0)	7(20.6)		
Grade level					
GL 08-10	8(34.8)	10(43.5)	5(21.7)	1.47	0.83
GL 12-14	46(29.7)	65(41.9)	44(28.4)		
GL 15-17	14(37.8)	15(40.5)	8(21.6)		
Ethnicity					
Yoruba	65(31.7)	86(42.0)	54(26.3)	0.06	0.96
Igbo	3(30.0)	4(40.0)	3(30.0)		
Religion					
Christian	56(32.9)	69(40.6)	45(26.5)	0.75	0.68
Muslim	12(26.7)	21(46.7)	12(26.7)		

Note. Table 5 shows the Fisher exact Chi-square test used to test the association between socio-demographic characteristics and knowledge of communication and teamwork. As shown in Table 5, χ^2 values are more than 0.05 sig. value.

4. Discussion

This study assessed the knowledge and patterns of communication and teamwork among operating theatre personnel and identified barriers to communication and teamwork in the operating theatre in selected hospitals in Lagos State, Nigeria. The study's results revealed that respondents had fair knowledge of communication and teamwork as they agreed that

communication is a dynamic process that involves the transmission and accurate reception of ideas accompanied by feedback to foster expected outcomes, and that teamwork is a dynamic process involving two or more health professionals with skills and common health goals in assessing, planning or evaluating patient care. This finding is in agreement with the findings of studies by Xyrichis and Ream (2008) and Levesque et al. (2018).

From the data collected, the analysis shows that the respondents had a fair knowledge of communication and teamwork in the operating theatre. This finding is in tandem with the study of Fraser and Greenhalgh (2001) who opined that for a successful operation in the operating theatre, theatre personnel must have a good knowledge and understanding of communication and teamwork. The study also revealed that the respondents communicate through written, spoken words, or visual media. This was supported by Frankel et al. (2007) and Lingard et al. (2002) that verbal communication through written, spoken words, or visual media is the most used pattern of communication in the operating room. The respondents also communicate routinely with other professionals in the theatre, as reported in a study of Frankel et al. (2007), which indicated that operating team members routinely communicate with one another to state their perceptions, actions and plans as the surgical procedure progresses. In this study, it was found that the operating team members frequently make decisions crucial to patient care. The finding also corroborates the observations of Lingard et al. (2002) on communication and teamwork events in the theatre, where surgeons, nurses and anesthetists asked questions and made suggestions important about the surgical procedure to achieve their goal.

Furthermore, the study revealed that the respondents often communicate only with their colleagues. This was in tandem with the submission of Norouzinia et al., (2016), who opined that all operating team members, irrespective of their profession and hierarchies, must communicate effectively and make decisions crucial to patient care. In addition to the findings above, the respondents could not support the idea that teamwork consumes time and drains energy. These are supported by Capra (2014) that sharing tasks and working as a team help to save time and conserve energy. Finally, the study showed that factors such as inferiority complex, cultural differences, over competence, over confidence individual bias, pressure to complete work, and workload serve as major barriers to communication and teamwork in the operating theatre. These were also reported in a study by Lingard et al. (2004) when they examined the events leading to communication failures and teamwork among health professionals. Also, Capra (2014) reported that challenges to communication and teamwork come from two sources: from within the team and from the surroundings. The finding is also in agreement with Carney et al. (2010) in their study that analyzed the frequency, root causes, and outcomes of wrong-site and wrong-patient procedures.

In addition, this study also revealed that there is no statistical association between age, gender, profession, years of experience, grade level, ethnicity and religion and knowledge of communication and teamwork among the theatre personnel. This negates the findings of a cross sectional study conducted by Kacholi et al. (2021) in selected regional referral hospitals in Tanzania where gender, years of experience and profession were associated with knowledge of teamwork. The finding is also in disagreement with the result of a study conducted among theatre personnel in the northern Nigeria teaching hospital by Lukong et al. (2020) where age, female gender and years of experience were found to be statistically associated with knowledge of teamwork and communication. This might be due to different in their cultural background and their environment of practice.

5. Implications and limitations

This study has established that the operating room is a highly technical and stressful environment where a patient may be at increased risk for harm. To avoid these preventable harms, communication and teamwork behavior in the operating room are essential for all operating theatre personnel to provide safe and effective surgical care to patients. Therefore, all operating theatre personnel, irrespective of their professional background and hierarchies, must communicate effectively using different patterns of passing information and work as a team to achieve the desired goal of safe surgery for surgical patients. Furthermore, provision of a conducive environment for working to facilitate could smooth communication and teamwork in the operating theatre.

This study has limitations. The theatre personnel's excessive workload prolonged the period of data collection. Another limitation was the relatively small sample for the pilot testing of the instrument. These limitation may limit the generalization of the results of this study.

6. Conclusion

Based on the findings of this study, it can then be concluded that respondents had fair knowledge of communication and teamwork and that most of them of the theatre personnel communicated through through written, spoken words or visual media in the theatre. Inferiority complex, cultural differences, over competence, over confidence were identified as barriers to effective communication and teamwork in the operating theatres. Therefore, the stakeholder must continually engage the theatre personnel in workshops and seminars to improve communication and teamwork among these personnel to improve their knowledge on communication and teamwork as well as removing the barriers to provide safe surgical care and improve surgical outcomes. Furthermore, continuous in-service training of operating theatre personnel is necessary. Further research should be conducted on surgical team members' attitudes towards teamwork and patients' safety in the operating theatre environment.

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Author contribution

OOO involved in study conceptualization/design, data collection and drafting of the manuscript.

OHO involved in data collection and data analysis.

IOK involved in manuscript drafting.

EOA was involved in critically reviewing the manuscript and proofreading.

IOO was involved in the drafting of the manuscript.

BRF involved in the editing of the manuscript.

All authors have read and approved the final manuscript. All authors met the requirements for authorship, and each author believes that the manuscript represents the honest work of all the contributors.

Conflict of interest

No form of conflict of interest regarding this manuscript.

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ORIGINAL RESEARCH

Quality of Clinical Nursing Education Programme in Ghana: Preceptors' Perspectives



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Article Info	Abstract
<p>Article History: Received: 4 May 2022 Revised: 6 August 2022 Accepted: 8 August 2022 Online: 31 August 2022</p> <p>Keywords: Clinical education; Ghana; nursing; preceptors; quality</p> <p>Corresponding Author: Gilbert Ti-enkawol Nachinab Department of Nursing Education, School of Therapeutic Sciences, University of the Witwatersrand, Johannesburg, South Africa Email: gilbertnaknab@gmail.com</p>	<p>Background: Clinical education is an important component of the training of nursing students. Preceptors play a key role in the clinical education of nursing students by providing support for the students during clinical placement. There is dearth of studies in the Ghanaian context that has assessed preceptors' perception of clinical nursing.</p> <p>Purpose: The purpose of this study was to assess preceptors' perceptions of the quality of clinical nursing education in Northern Ghana.</p> <p>Methods: This study was a cross-sectional survey conducted using an already existing questionnaire. Three hundred and nineteen (319) preceptors recruited from three hospitals participated in the study. A proportional quota sampling technique was used to allocate the sample size to the three hospitals and a simple random sampling technique was used to select the participants. The data were analysed using Stata version 15 and the results were presented using descriptive and inferential statistics.</p> <p>Results: The study findings indicate that the preceptors' generally perceived that the quality of clinical placement area and clinical assessment were slightly above average as they scored each of them 2.30 on a scale of 0-4 (95% CI:2.21-2.39). The preceptors also perceived that the quality of clinical teaching and learning was average as they scored it 2.04 on a scale of 0-4 (95% CI:1.95-2.13). Also, the preceptors had a lower level of agreement, 1.75 on a scale of 0-4 (95% CI:1.25-2.45) regarding teaching and development of the students being the responsibility of only the university.</p> <p>Conclusion: Preceptors perceived that nursing education institutions and clinical facilities need to work together to improve clinical nursing education. This calls for the need for an effective collaboration between clinical facilities and nursing education institutions to develop training programmes for preceptors to improve their skills in clinical teaching and clinical assessment of students.</p>

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1. Introduction

There is a need to ensure that the training of nurses meets international standards, which in turn requires the use of preceptors to guide students in the learning of clinical skills (Giroto et al., 2019). Preceptorship helps students transition to professional nurses through the acquisition of clinical competence and confidence (Madhavanpraphakaran et al., 2013; Panzavecchia & Pearce, 2014). The introduction of the concept of preceptorship has led to increased collaboration between nursing education institutions and clinical facilities with preceptors being at the forefront of clinical teaching during clinical placement.

Preceptors are professionals with adequate knowledge and skills to support students during clinical placement. Preceptors are often employed by academic institutions in part-time or full-time positions to serve as teachers in the clinical setting (Botma et al., 2012). In Ghana, preceptors are often full-time employees of the clinical facilities which may affect their availability to interact with and support students due to conflicting responsibilities. Ryan and McAllister (2019) indicated that spending time interacting with students and getting to know them was deemed necessary in enhancing the relationship between clinical staff and students.

Adequate preparation, which includes an in-depth understanding of the role of preceptorship, is necessary to efficiently facilitate the clinical teaching of students (Bengtsson & Carlson, 2015). This will be realized through a collaborative effort between academics and

clinicians to design a training programme for clinical nurses to assist them to develop pedagogical competence in preceptorship (Wu et al., 2017; Atakro et al., 2019). Aspects that need to be included in such a programme are teaching and learning strategies, reflective and critical thinking, communication skills and the role of the preceptor (Bengtsson & Carlson, 2015). In addition, preceptors need to enhance their assessment skills which should include the art of giving constructive feedback (Wu et al., 2017).

Apart from training, some factors that will increase the effectiveness of preceptorship include having a protected time to guide students, scheduling the students to work the same shift as the preceptor, motivation of the students to learn skills and the need for students to show interest in direct patient care (Madhavanpraphakaran et al., 2013). When preceptors devote time to students and ensure a good preceptor-student relationship, the students' clinical learning is enhanced (McSharry & Lathlean, 2017). While working in the same shift facilitates a positive and useful preceptor-student relationship, the preceptor can provide one-on-one support. In Ghana, preceptors are not given a protected time to support students during clinical placement (Asirifi et al., 2017).

The use of learning strategies which ensure that students are actively involved is necessary for improving the learning of clinical skills (Giroto et al., 2019). Clinical conferences with students are an important strategy that allows students to clarify their placement objectives to guide the clinical learning process (Henderson et al., 2018). Preceptors who use dialogue and appropriate questioning techniques promote critical thinking and problem-solving skills among students (McSharry & Lathlean, 2017).

Clinical teaching and learning is driven by effective communication (Moonaghi et al., 2015; Needham et al., 2016; Cândida et al., 2017). Preceptors and students need to discuss the barriers to learning that students face during clinical placement and identify possible strategies that could be used to resolve such barriers (Cândida et al., 2017). Clinical instructors' communication with students should be based on fairness, openness, justice and respect (Moonaghi et al., 2015). Clinical facilitators agree that to have a successful clinical placement, the interaction between nurses, students and patients has to be effective (Needham et al., 2016). Clinical facilitators explain that effective communication will help unravel the individual needs of students so that clinical teaching can be tailored to meet such needs (Needham et al., 2016).

In Ghana, key informants such as nurse managers, lecturers and clinical placement coordinators are of the view that lack of resources, inadequate staffing and students' attitudes are major factors negatively affecting clinical nursing education (Nachinab & Armstrong, 2022). Aside lack of resources, the effectiveness of clinical assessment of students is affected by inadequate training of examiners and lack of standardization of assessment processes in Ghana (Anim-Boamah et al., 2022). Also, students in Ghana are of the view that incongruence in clinical teaching, practice and assessment were major factors affecting the development of clinical competencies (Anim-Boamah et al., 2021).

There is dearth of studies on perspective of preceptors on the quality of clinical nursing education in the Ghanaian context. The preceptors' perspectives on how best the clinical placement area is conducive for learning of clinical skills have not been adequately assessed. The quality of teaching and learning of clinical skills, and clinical assessment of nursing students have also not been adequately researched into in the Ghanaian. This study was, therefore, conducted to assess preceptors' perceptions of clinical placement area, clinical teaching and learning, and clinical assessment in the Ghanaian context.

2. Methods

2.1 Research design

A cross-sectional survey was employed to assess the preceptors' perceptions of clinical nursing education. Cross-sectional designs are used to describe the status of a phenomenon and the relationship among phenomena at a point (Polit & Beck, 2010). This design allows the researchers to collect sufficient original data to describe the preceptors' perceptions of the current state of clinical nursing education in Ghana.

2.2 Setting and samples

The survey was done at three hospitals in Northern Ghana which include one each of the district, regional and tertiary hospitals, all of which serve as clinical sites for undergraduate

nursing students. The district and regional hospitals serve as referral facilities for clinics and health centers in the region. The tertiary level facility serves as a referral facility for all health facilities within the northern part of Ghana.

The participants for this study were preceptors in hospitals that serve as clinical sites for undergraduate nursing students. Preceptors were registered general nurses with a minimum academic qualification of a diploma in nursing and at least three years of working experience. They were permanent staff of the selected hospitals engaged by Nursing Educations Institutions (NEIs) to support students during clinical placement. Preceptors who were on leave or working in units where undergraduate nursing students were not frequently placed were excluded from the study. Preceptors who met the inclusion criteria but did not voluntarily consent to participate in the study were also excluded.

Using the total number of preceptors in the three hospitals as the accessible population and an alpha level of 0.05, Yamane's (1967) formula for sample size calculation was applied. In all, 319 questionnaires were administered but only 307 preceptors completed and returned the questionnaire, representing a 96.2% response rate. The data were collected between November, 2019 and February, 2020.

A multistage sampling technique was used to recruit the respondents. The hospitals were purposively selected because they serve as clinical placement sites for undergraduate nursing students. A proportional quota sampling technique was used to allocate the 319 questionnaires to the three selected hospitals. At each hospital, the clinical coordinator helped in purposively selecting units in which undergraduate nursing students are frequently placed when they come for clinical placement. The sample size for the hospital was divided among the selected wards. In each ward, a simple random sampling technique was applied to give all respondents an equal chance to participate.

2.3 Measurement and data collection

The questionnaire used for the study was originally developed by Peter (2008) but was adapted and validated in a previous study by Xaba (2015). The questionnaire is publicly available but the researcher obtained permission to use the questionnaire. The questionnaire was in English language and no significant changes were made. The questionnaire had four sections. Section A had questions on demographic data. Section B, C and D had questions on perceptions of clinical placement area, clinical teaching and learning, and clinical assessment respectively. Section B had 13 items, section C had 10 items and section D had 9 items. The internal consistency of the instrument was checked in a previous study using Cronbach alpha. The overall Cronbach alpha was 0.750, and this made the instrument reliable because the minimum desired Cronbach alpha is 0.7 (Bujang et al., 2018). The questionnaire was also presented to the research supervisors who are all nursing education experts and two local clinical nursing education experts to check for face and content validity. The original questionnaire was measured on a scale of 1-5. In the present study, the scoring of the tool was reordered where Neither Agree nor Disagree=0, Strongly Disagree=1, Disagree=2, Agree=3 and Strongly Agree=4. With the reordering of the scale of the original questionnaire, a pre-test was conducted where Cronbach alpha reliability test was performed to ascertain if the scale was still consistent with the reliability score reported in the original questionnaire. Thirty (30) preceptors were recruited from a hospital within the northern region of Ghana for the pretesting. The hospital where the pretesting was done was excluded from the main study. In this study, the reordered questionnaire yielded an overall Cronbach alpha of 0.925. The Cronbach alpha for the clinical placement area subscale was 0.868, clinical teaching and learning was 0.811 and clinical assessment was 0.806.

The principal researcher obtained formal permission from the authorities of the hospitals. The first visit to each unit in the hospital was done by the researcher and a trained research assistant who met with the respective unit managers for a preliminary discussion on the data collection process. At each selected unit, the study was explained to respondents and the information sheet was given to them. Respondents who voluntarily consented to participate were selected. A trained research assistant assigned to each unit continued visiting the unit at the beginning of each shift until all the required questionnaires were administered. A sealed box was placed in each unit to allow the respondents to return the questionnaire anonymously.

2.4 Data analysis

The questionnaires were coded and entered into Epidata. The data were then exported and analysed using Stata version 15. All the analyses were performed at a 95% level of confidence interval. Descriptive statistics including frequencies and percentages were used to present the background characteristics of respondents. Perception of the quality of clinical nursing education nursing was assessed on a scale of 0-4. Three main components of clinical nursing education consisting of clinical placement area, clinical teaching and learning, and clinical assessment were assessed. The ratings were averaged to yield a perception score for each of these components of clinical nursing education.

To make inferential statements, linear regression analysis was conducted to examine the extent to which perceptions of clinical placement area were explained by the other variables. The linear regression analysis consisted of two models; model 1 and model 2. In model 1, the background characteristics were examined to determine their contribution to the perception of the clinical placement area. In model 2, background characteristics, perception of clinical teaching and learning, and perception of clinical assessment of respondents were examined to determine their influence on the perception of clinical placement area.

2.5 Ethical considerations

Ethical clearance was obtained from the Human Research Ethics Committee (Medical) of University of the Witwatersrand (M190807) and the Ghana Health Service Ethics Committee (GHS-ERC 007/09/19). Participation in the study was voluntary and respondents could decide to withdraw from the study at any stage without any negative repercussions. No identifying information was collected from the participants and information collected was reported as aggregate data. The respondents gave their consent prior to answering the questionnaire.

3. Results

3.1 Demographic characteristics of preceptors

Table 1 indicates that 52.4% (n=161) of the preceptors were females and 47.6% (n=146) were males. Most (42.4%, n=130) were within the age range 30-39 years, and 37.8% (n=116) were within 20-29 years. Of the 307 preceptors, 74.3% (n=228) worked in the tertiary hospital, 14.0% (n=43) worked at the regional hospital and 11.7% (n=36) worked in a district hospital.

Table 1. Demographic characteristics of preceptors

Characteristics	Frequency	Percent
Gender		
Female	161	52.4
Male	146	47.6
Age (year)		
20-29	116	37.8
30-39	130	42.4
40-49	52	16.9
50-59	8	2.6
60+	1	0.3
Facility Type		
Tertiary Hospital	228	74.3
Regional Hospital	43	14.0
District Hospital	36	11.7
Academic qualification		
Diploma	188	61.2
Bachelor	115	37.5
Masters	4	1.3

3.2 Perceptions of quality of clinical nursing education amongst preceptors

Table 2 shows a descriptive summary of preceptors' perceptions of the quality of clinical nursing education which was rated on a scale of 0-4. Three main components of clinical nursing

education (clinical placement area, clinical teaching and learning, clinical assessment) were assessed. The ratings were averaged to yield a perception score for each of these clinical nursing education components and an overall score was obtained.

Perception of the Clinical Placement Area (CPA), which was assessed with 13 items, yielded a composite score of 2.30 on a scale of 0-4 (95% CI:2.21-2.39). This translates into 57.5% level of agreement with the statements assessing perceptions on the quality of CPA. With the individual items, the highest score on the quality of CPA was on the question: "Placement dates are pre-published before the placement of students to the clinical facilities" The preceptors rated this question 2.66 on a scale of 0-4 (95% CI:2.52-2.80). In contrast, the lowest level of quality on CPA related to the question that sought to find out if the development and teaching of student nurses is only the responsibility of the university. The preceptors rated this question 1.75 on a scale of 0-4 (95% CI:1.62-1.88).

Preceptors' Clinical Teaching and Learning (CTL) composite score was 2.04 on a scale of 0-4 (95% CI:1.95-2.13) translating into a 51.0% level of agreement with statements assessing perceptions on quality of CTL. Of 11 items that were used to assess perception on CTL, the highest score was on the question: "Clinical accompaniment does benefit students". The preceptors rated this question 2.69 on a scale of 0-4 (95% CI:2.54-2.84). The lowest score of quality of CTL was on the question "The university has enough equipment and material resources for demonstration and feedback of clinical skills", which was rated 1.75 on a scale of 0-4 (95% CI:1.61-1.89).

Nine items were used to assess the perception on quality of Clinical Assessment (CA). The composite score of preceptors' perceptions of the quality of CA was 2.30 on a scale of 0-4 (95% CI:2.21-2.39), indicating a 58% level of agreement with statements assessing the perception of the quality of CA. The highest score on the perception of quality of CA was on the question "As preceptors, we are involved in clinical assessments of students" which was rated 2.64 on a scale of 0-4 (95% CI:2.48-2.80). The lowest score on CA was on the question "Student and the facilitator discuss and evaluate performance against each competency thereby identifying areas of strength and areas needing improvement". The preceptors rated this question 2.01 on a scale of 0-4 (95% CI: 1.85-2.17).

3.3 Predictors of clinical nursing education perceptions

To examine the extent to which clinical placement area perception is explained by the other variables, linear regression analysis was conducted. Table 3 below indicates that the background characteristics of preceptors were examined in an initial model (Model 1) to determine their influence on the perception of preceptors in the Clinical Placement Area. The preceptors' background characteristics (gender, age, years of service and academic qualification) all together explained only 1.9% of the variations in perception of the clinical placement area (Adjusted $R^2=0.019$, $p=0.22$). In assessing the individual contribution of background characteristics, the contribution of academic qualifications to the perception of the Clinical Placement Area was statistically significant ($\beta=0.202$, $p=0.042$). Gender, age and years of service did not make a statistically significant contribution to the perceptions on Clinical Placement Area. However, being a female and increasing age are associated with a decreasing perception score for the clinical placement area. Thus, all this being equal, being a female is associated with a .098 decrease in the perception score ($\beta=-0.098$, $p=0.312$) and moving from one age bracket to the next higher one is associated with a decrease of 0.02 in the perception score ($\beta=-0.02$, $p=0.783$).

Table 3 shows that in Model 2, all the background characteristics of preceptors together with perception on clinical teaching and learning, and clinical assessment accounted for nearly 59% of the differences in their clinical placement area perception (Adjusted $R^2=0.592$, $p<0.001$). Gender, age and years of service did not make a statistically significant contribution to the perceptions on the Clinical Placement Area. However, similar to Model 1, being a female and increasing age was associated with a decrease in the perception score. Academic qualification had a statistically significant relationship with the perceptions on the Clinical Placement Area ($\beta=0.147$, $p=0.023$). Also, holding all other factors constant, a unit increase in the Clinical Teaching and Learning score is associated with a 0.042 increase in the perception score of the Clinical Placement Area and this was statistically significant ($\beta=0.421$, $p<0.001$). Similarly, a unit increase in the Clinical Assessment score is associated with a 0.43 increase in the perception score of the Clinical Placement Area which was statistically significant ($\beta=0.429$, $p<0.001$).

Table 2. Descriptive summary of the perception of preceptors on clinical nursing education

Components of Clinical Nursing Education	Mean	Std. Error	Std. Deviation	95% CI		% score on a 4-point scale
				Lower	Upper	
<i>Clinical Placement Area Score</i>	<i>2.30</i>	<i>0.05</i>	<i>0.84</i>	<i>2.21</i>	<i>2.39</i>	<i>57.5%</i>
Placement dates are pre-published before the placement of students to the clinical facilities.	2.66	0.07	1.25	2.52	2.80	66.5%
Students get enough clinical exposure in the clinical placements	2.51	0.08	1.32	2.36	2.66	62.8%
There is sufficient clinical accompaniment by clinical instructors in the placement area	2.13	0.08	1.41	1.97	2.29	53.3%
There is an effective communication between clinical facilitators and staff in the clinical facilities.	2.30	0.08	1.37	2.15	2.45	57.5%
Students and clinical facilitators have effective communication	2.30	0.08	1.41	2.14	2.46	57.5%
There is effective communication between clinical facilitators and clinical staff	2.42	0.07	1.25	2.28	2.56	60.5%
Lecturers also visit the clinical area for accompaniment of students.	2.33	0.08	1.39	2.18	2.48	58.3%
The learning needs of students are clarified to the students.	1.96	0.08	1.46	1.80	2.12	49.0%
There is a joint responsibility between the lecturers and the clinical staff to develop the student nurses.	2.54	0.08	1.39	2.38	2.70	63.5%
The development and teaching of the student nurses is only the responsibility of the university.	1.75	0.07	1.18	1.62	1.88	43.8%
The clinical facilities are supportive of professional growth, skills development and practice of students.	2.61	0.08	1.32	2.46	2.76	65.3%
There is a good relationship between clinical facilitators and the clinical staff in clinical placements.	2.07	0.08	1.44	1.91	2.23	51.8%
There are enough clinical placement facilities to place students for clinical practice.	2.30	0.08	1.33	2.15	2.45	57.5%
<i>Clinical Teaching and Learning Score</i>	<i>2.04</i>	<i>0.05</i>	<i>0.81</i>	<i>1.95</i>	<i>2.13</i>	<i>51.0%</i>
The university has enough space for clinical teaching and learning activities.	1.81	0.07	1.20	1.68	1.94	45.3%
The university has enough equipment and material resources for demonstration and feedback of clinical skills.	1.75	0.07	1.21	1.61	1.89	43.8%
The clinical placement areas have enough equipment and material resources for demonstration and feedback of clinical skills.	1.86	0.07	1.29	1.72	2.00	46.5%
Students are theoretically prepared before they are sent to clinical facilities	2.07	0.08	1.40	1.91	2.23	51.8%
Nursing students are willing to learn.	2.28	0.08	1.42	2.12	2.44	57.0%
Students accept constructive criticism.	1.99	0.08	1.45	1.83	2.15	49.8%
All students know the limitations of clinical teaching and learning process.	1.93	0.08	1.37	1.78	2.08	48.3%
A remedial plan is implemented if a student fails to master a skill	1.95	0.07	1.26	1.81	2.09	48.8%
Clinical facilitators get full support from the lecturers.	2.07	0.08	1.38	1.92	2.22	51.8%
Clinical accompaniment does benefit students.	2.69	0.08	1.38	2.54	2.84	67.3%

Table 2. Continued

Components of Clinical Nursing Education	Mean	Std. Error	Std. Deviation	95% CI		% score on a 4-point scale
				Lower	Upper	
<i>Clinical Assessment</i>	2.30	0.05	0.85	2.21	2.39	57.5%
Students are informed of the specific criteria and standards for each clinical placement against which they will be assessed.	2.24	0.08	1.31	2.09	2.39	56.0%
All students sign an assessment contract before being assessed.	2.10	0.08	1.31	1.95	2.25	52.5%
Students are informed in time before clinical assessments start.	2.39	0.07	1.28	2.25	2.53	59.8%
Students avail themselves for clinical practice before they are assessed.	2.26	0.08	1.35	2.11	2.41	56.5%
The assessment tools facilitate the integration of theory and practice.	2.39	0.08	1.34	2.24	2.54	59.8%
There is confidentiality of the assessment outcome for each student.	2.14	0.08	1.32	1.99	2.29	53.5%
Student and the facilitator discuss and evaluate performance against each competency thereby identifying areas of strength and areas needing improvement.	2.01	0.08	1.40	1.85	2.17	50.3%
Preceptors have an input in the development of assessment tools.	2.52	0.08	1.44	2.36	2.68	63.0%
As preceptors we are involved in clinical assessments of students.	2.64	0.08	1.41	2.48	2.80	66.0%
<i>Clinical Nursing Education Perception Score</i>	2.21	0.04	0.74	2.13	2.29	55.3%

Table 3. Predictors of perception of clinical placement area

Model	Predictors	Coefficients	Std. Error	t-statistic	p-value
1	(Constant)	2.088	0.175	11.916	0.000
	Gender	-0.098	0.097	-1.014	0.312
	Age	-0.02	0.074	-0.275	0.783
	Years of service	0.013	0.104	0.123	0.902
	Academic qualification	0.202	0.099	2.039	0.042
	Model summary: <i>Adjusted R</i> ² =0.019, <i>F</i> _(4, 302) =1.46, <i>p</i> =0.22				
2	(Constant)	0.292	0.144	2.032	0.043
	Gender	-0.066	0.063	-1.056	0.292
	Age	-0.051	0.048	-1.064	0.288
	Years of service	0.062	0.067	0.92	0.359
	Academic qualification	0.147	0.064	2.285	0.023
	Clinical teaching and learning Score	0.421	0.049	8.628	0.000
	Clinical assessment	0.429	0.047	9.137	0.000
	Model summary: <i>Adjusted R</i> ² =0.592, <i>F</i> _(2, 300) =210.72, <i>p</i> <0.001				

Notes: Outcome variable: Clinical Placement Area Score

4. Discussion

The study aimed at assessing preceptors' perceptions of the quality of clinical nursing education in Ghanaian context. The quality of clinical nursing education was assessed under three main components, which include clinical placement area, clinical teaching and learning, and clinical assessment. The preceptors generally perceived that the quality of clinical placement area and clinical assessment were slightly above average as they score each of them 2.30 on a scale of 0-4 (95% CI:2.21-2.39). The preceptors also perceived that the quality of clinical teaching and

learning was average as they scored it 2.04 on a scale of 0-4 (95% CI:1.95-2.13). Despite the above average ratings on the quality of the three component of clinical nursing education, the findings point out specific areas that require improvement.

4.1 Clinical placement area

The clinical placement area plays an important role in the clinical skills training of nursing students. The study established that the preceptors generally expressed a 57.5% level of agreement with statements assessing the perceptions of the clinical placement area. Thus, the preceptors' ratings indicate a more than average favourable view of the clinical placement area. That notwithstanding, the general finding indicates that they believe there is room for improvement in the clinical placement area. The findings of the present study agree with a study among students in Iran which revealed a positive perception of the clinical learning environment (Rokhafrooz et al., 2022). The preceptors in the present study are employees of the clinical facilities hence this could influence how positive they perceived the clinical placement area. Other studies have indicated the need to improve the clinical placement area (Kananu et al., 2020; Mbakaya et al., 2020; Rajeswaran, 2017). It can therefore be suggested that the clinical placement area should be assessed at the beginning of every academic year to ensure that students get optimal clinical placement experiences.

In the present study, the academic qualification of participants was found to have a significant influence on their perceptions of the clinical placement area. The participants in the present study with higher qualifications held more negative perceptions of the clinical placement area which may have been more realistic, and this could be because they had more exposure or understanding of the facilities required in a clinical placement area to enhance clinical education. Similarly, a study in Malawi revealed that preceptors with at least a BSc in Nursing were more suitable for facilitation of clinical teaching and learning (Mhango et al., 2021). However, Nursing Educations Institutions (NEIs) could also collaborate with clinical facilities to organize continuous professional development programmes for experienced nurses who have the desire to be preceptors but have comparatively lower academic qualifications. Also, it can be suggested that NEIs could consider assigning nurse educators to clinical facilities to support and collaborate with preceptors in the clinical teaching of students.

The present study established that the preceptors' level of agreement regarding whether clinical placement dates are pre-published was 2.66 on a scale of 0-4 translating to 66.5%. The finding in the present study, although above average, shows a need for improvement in communication from the academic faculty responsible for publishing clinical placement dates. The findings in the present study is consistent with other studies which have reported that communication is an essential driving force of clinical nursing education (Moonaghi et al., 2015; Needham et al., 2016; Cândida et al., 2017). In the present study setting, the clinical facilities have to receive students from various NEIs, hence pre-publishing clinical placement dates will allow the clinical facilities to make a schedule for the various NEIs to avoid overcrowding during clinical placement. Pre-publishing clinical placement dates early is also necessary in ensuring that preceptors prepare to receive students.

The study findings revealed that there was an above average level of agreement that communication between students and clinical staff was effective. This study finding differs from an earlier study in Ghana which cited communication as a major challenge in preceptorship (Asirifi et al., 2017). Also, Ryan and McAllister (2019) indicated that spending time interacting with students and getting to know them was necessary for enhancing the relationship between clinical staff and students. The results of the present study suggest that clinical staff spend some amount of time interacting with students during clinical placement. However, preceptors in the present study are employees of the clinical facilities who combine their duties as nurses with the teaching of students during clinical placement. The lack of protected time to support students may negatively affect effectiveness of the communication. Considering the key role communication plays in making clinical placement successful, there is the need to put in place strategies such as pre-briefing and debriefing sessions to enhance communication between students and preceptors.

The study findings also indicate that the preceptors were of the view that the teaching and development of students is a joint responsibility of the university and the clinical facilities. This finding is consistent with that of other studies which also emphasised the collaborative role that

should be played by NEIs and clinical facilities in the clinical education of nursing students (Direko & Davhana-Maselesele, 2017; Maguire et al., 2012). Clinical nursing education consists of students acquiring theoretical knowledge and translating it into skills acquisition in the clinical placement area. It can be suggested that stronger collaboration will therefore play an essential role in coming up with strategies to support students to acquire professional skills. The development of a memorandum of understanding between NEIs and clinical facilities could be an important step towards stronger stakeholder collaboration.

4.2 Clinical teaching and learning

Clinical teaching and learning are core components of clinical nursing education. Overall, the findings indicate that the preceptors had a favourable stance towards the present state of clinical teaching and learning. The preceptors are the main group of clinical staff expected to assist students with the learning of clinical skills hence they could have scored themselves favourably to indicate that they were doing well. Also, clinical teaching and learning take place in the clinical facilities where the preceptors are employed so they could have been attempting to present the clinical environment in a favourable light.

The preceptors scored the clinical facilities 1.86 on a scale of 0-4 regarding the ability of the clinical facilities to provide adequate equipment and material resources for demonstration. This finding indicates that the clinical facilities may not be in the best position to support students to learn clinical skills. The finding agrees with an earlier study in Ghana in which the lack of material resources in the clinical area was reported as a major cause of the theory-practice gap (Salifu et al., 2019). In Ghana, though the clinical facilities provide the opportunity for clinical training of students, they are not obliged to provide equipment and material resources for clinical training. However, the NEIs could collaborate with clinical facilities to ensure the provision of adequate material resources for clinical skills teaching and learning. Where possible, NEIs may need to ensure that students are placed in clinical facilities that have adequate equipment and material resources. Aside, the NEIs should consider having pre-clinical placement meetings with preceptors to discuss how clinical placement objectives could be achieved in the face of the available equipment and material resources.

Students learn clinical skills at different rates and some may struggle to reach level of competency within the stipulated clinical placement duration. The development of a remedial plan that would assist students to gain mastery of clinical skills is an important factor in clinical teaching. The study established that the preceptors scored below average on the utilisation of a remedial plan to enable students to gain competence during clinical placement. The lower score may indicate that there is no utilisation of remedial plan or the preceptors have too many clinical responsibilities to ensure that remedial plans are implemented. In Ghana, the curriculum for training nursing students is competency-based hence there is a need for increased efforts directed at supporting students to achieve clinical placement objectives.

The preceptors also scored the students' acceptance of constructive criticism as less than average. To improve the learning of clinical skills, there is the need for preceptors to identify and criticise students on areas of the clinical skills learning that require improvement. Preceptors require some training on proper questioning techniques, giving cues and giving feedback to students during skills learning (Botma et al., 2012). However, it may be difficult to determine if the criticisms given by preceptors in this study were actually constructive or not. This is because preceptors in the present study are not trained in preceptorship and this could account for an inability to give constructive criticism.

4.3 Clinical assessment

The need for assessment and the fairness of assessments is an essential component of clinical education. The results of the present study indicate that while the preceptors had a more favourable view of the current method of clinical assessment, there was a general perception that improvement was needed. The finding concurs with another study in Ghana which identified the need to train assessors, standardise the assessment process and provide adequate resources for clinical competency assessment (Anim-Boamah et al., 2022). Also, specific areas of clinical assessment that were identified as requiring improvement include the need for signing a performance contract by students before the assessment, involving preceptors in development of

the assessment tools, and preceptors discussing and evaluating performance against each competency.

Clinical learning contracts have demonstrated a positive impact on students' clinical learning (Sajadi et al., 2017). The present study revealed that the preceptors scored a less than average on the signing of learning performance contracts to enhance the achievement of clinical placement objectives. This finding is consistent with a study conducted in China which revealed that there was poor knowledge regarding the signing a performance contract (Chan & Wai-Tong, 2000). By signing a performance contract, students and preceptors are able to understand their responsibilities in ensuring that students achieve their clinical placement objectives. To ensure effective application of performance contracts, NEIs should organise continuous professional development for preceptors to enhance their understanding of the concept.

The level of agreement regarding whether the student and the facilitator discuss and evaluate performance against each competency was scored as average by the preceptors. Receiving feedback has been identified as an important strategy in making clinical assessment more effective (Bani-issa et al., 2019). Students are expected to achieve specific competencies at every level of their study. One of the main reasons for the clinical assessment of students is to evaluate their performance against the expected competencies. A discussion after the clinical assessment will serve as feedback that will enable students to know the areas in which they need to put more effort. Preceptors should therefore endeavour to hold feedback sessions for students after clinical assessment.

5. Implications and limitations

The study revealed that preceptors indicated that clinical nursing education is a joint responsibility between NEIs and clinical facilities. This calls for effective collaboration to ensure that clinical nursing education is well structured and supported by both NEIs and clinical facilities. The study also identified the need to develop and implement remedial plans for students who are unable to achieve clinical placement objectives within the clinical placement schedule. This will require NEIs ensuring that preparation of students includes clarifying the importance of instituting remedial plans to enhance the development of clinical competencies. Also, the signing of performance during clinical placement was identified as a way of improving the clinical nursing education. This strategy should be given the required attention by first teaching students the importance of signing the performance contracts.

The study had some limitations. The recruitment of preceptors from facilities in northern Ghana did not allow for the assessment of views in the southern part of Ghana. One will, therefore, not be able to tell if the views here represent that of southern Ghana. Also, the use of a quantitative approach did not allow the preceptors to express their views beyond what the questionnaire provided.

6. Conclusion

The study findings suggest that though the preceptors generally perceived the quality of clinical nursing education to be slightly above average; there is the need to take steps to ensure that it improves. The study findings indicate that preceptors viewed clinical nursing education as a shared responsibility between NEIs and the clinical facilities. This calls for the need to for collaboration and effective communication between NEIs and the clinical facilities. The collaboration could involve developing training programmes for preceptors to improve their skills in clinical teaching and clinical assessment of students. There is the need to have scheduled assessment of the quality of clinical nursing education to inform strategies for improvement. Also, further studies should be done using qualitative approach to gain in-depth understanding of the issues that require redress to improve clinical nursing education.

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Author contribution

The first author (GTN) conducted the study under the guidance of the second author (SJA). Both authors (GTN and SJA) were involved in the conceptualization, data collections, analysis and manuscript writing.

Conflict of interest

The authors declare that there is no conflict of interest.

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ORIGINAL RESEARCH

Factors Affecting the Quality of Life of Older People during the COVID-19 Pandemic



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Abstract

Background: Changes that occur in the life of older people during the COVID-19 pandemic present many challenges towards achieving better quality of life. However, only a limited number of studies that evaluate factors affecting the quality of life of older people during the COVID-19 pandemic are available.

Purpose: This study aimed to identify the quality of life and factors affecting the quality of life of older people during the COVID-19 pandemic.

Methods: This study employed a cross-sectional design using anonymous online questionnaires of 208 respondents who were selected using purposive sampling. This study was conducted during September to December 2020 in North Sumatra and Yogyakarta provinces. The QoL was measured using the World Health Organization Quality of Life (WHOQOL)-BREF questionnaire in the Indonesian version. The descriptive statistics were calculated for socio-demographics, while their association with quality of life was analyzed using Mann-Whitney and Kruskal-Wallis statistics. Multiple linear regression was used to determine the predictor factors affecting the quality of life of older people.

Results: The results of the study showed that the mean and standard deviation for physical domain factors was 64.46(11.81); 64.61(11.98) for the psychological domain; 64.85(12.81) for the social domain, and 61.08(13.01) for the environmental domain. Factors significantly associated with the quality of life included age, retirement, living situation, health insurance, and medical history ($p < 0.05$). However, the predictor factor affecting the quality of life of older people during the COVID-19 pandemic was medical history (β -value=0.25).

Conclusion: Predictor factor affected the quality of life was medical history. The study suggests the government and health care professionals, specifically community health nurses, to promote the utilization of Integrated Elderly Health Service (IEHS) among older adults and families to maintain the quality of health.

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1. Introduction

Today, the global community is being challenged by a devastating public health situation. The world is struggling with a pandemic caused by the SARsCOV2 virus, causing the COVID-19 pandemic. WHO data show that the number of cases confirmed as positive for COVID-19 up to 20th July 2020, is as high as 14,043,176 with a mortality rate of as much as 597,583 from 216 countries (World Health Organization, 2020a). The increasing number of cases of confirmed positive COVID-19 cases is a concern regarding several aspects including its danger to older people. The Center of Disease Center and Prevention explains that the number of deaths due to COVID-19 is primarily in the age group of 65 years and above with a percentage of 60% as of May 20, 2020 (Center for Disease Control and Prevention, 2020). Yogyakarta and North Sumatra provinces in Indonesia were found to have the highest number of older people with a high life expectancy (The Central Bureau of Statistics, 2020). Based on the report of the task force in charge of acceleration of the handling of the COVID-19, as of July 20, 2020, the age group who suffered the highest number of fatalities due to COVID-19 is that of 60 years and above representing 41.2%, while for the age group of 46 to 59 years, it was 39.7% (The Task Force for the Acceleration of Handling Covid-19, 2020). Older people in this stage of life often experience a variety of functional losses pertaining to physical, mental, and psychosocial factors,

including changes in one's spiritual considerations (Safitri, 2018; Sunaryo et al., 2016; Touhy & Jett, 2018).

The COVID-19 pandemic has indeed significantly affected the lives of older people. Measures supported by government policies such as physical distancing, and lockdowns cause older people to spend most of their waking time in their homes, with limited physical activities and social contact. These situations led to the view that older people were lonely and experiencing social isolation while they affirmed that their mental health was affected, leading to depression and cognitive impairments, subsequently resulting in suicides. Inability to access health services for older people increases their anxieties and the fear of contracting the deadly disease, resulting in a constant fear of death, especially of dying alone without their family members and relatives (Courtin & Knapp, 2017; National Institute on Aging, 2019; World Health Organization, 2020b).

The quality of life of older people is the essence of living among older people who are able to adapt and survive, especially in unpredictable times such as the COVID-19 pandemic. Quality of life can predict mortality in the presence or absence of physical dependence (Van Biljon et al., 2015). The quality of life of older people is said to be positive when they are in social contact especially with families and children, while it can be viewed negatively when the dependency is brought about by functional limitations such as unhappiness and reduced social contact due to the death of a spouse, family member or friend (Netuveli & Blane, 2008). Based on previous research, the factors that affect quality of life of older people are health and the roles of family members (Research Center for Population of the Indonesian Institute of Sciences, 2020).

Older people during the COVID-19 pandemic had low quality of life and high depression, such as study in Israel showed that older people had moderate level of depression and depression exhibits a strong negative association with health-related quality of life (Levkovich et al., 2021). Another study has also shown that restricted life-space mobility was associated with impact on quality of life in older people during the COVID-19 pandemic (Saraiva et al., 2021). Other research shows that the institutionalization influences negatively on the quality of life of the older people (De Medeiros et al., 2020). Furthermore, quality of life of older people significantly decreased during the pandemic compared to the prior year, so over 80% used technology to maintain contact with family and friends, and social networks did not change (Siette et al., 2021).

There are many factors that can influence quality of life of older people during the COVID-19 pandemic. The previous research showed that participation in elderly integrated health service post (EIHSP) had a significant relationship with depression levels and higher depression levels significantly affected quality of life on every domain (Margaretha et al., 2021). In Saudi Arabia, it was explained that the factors associated with quality of life are psychological experiences and chronic medical conditions (hypertension, diabetes, heart disease, cancer, obesity, psychological problems, arthritis, and others) is associated with quality of life scores (Algahtani et al., 2021). Meanwhile, a study in Korea revealed that there was significant relationship between marital status and quality of life (Han et al., 2014). A study in Macao explained that depressive symptoms, medical conditions, and insomnia are factors associated with quality of life (Kuok et al., 2017). Another study in Bangladesh revealed that depression, social support, health services availability, activities of daily living, and sleep problems are associated with quality of life of older people (Uddin et al., 2018). In Indonesia, which has a high life expectancy, it is a challenge to realize the quality of life of older people, especially during the COVID-19 pandemic. The government has tried to create several programs that focus on older people but due to the changes felt during the COVID-19 pandemic in terms of physical, psychological, social, and environmental aspects, it still needs to be explored. However, only a limited number of studies that evaluated factors affecting the quality of life of older people during the COVID-19 pandemic were available. This study aimed to identify the quality of life and factors affecting the quality of life of older people during the COVID-19 pandemic.

2. Methods

2.1 Research design

This study employed a cross-sectional design using anonymous on-line questionnaires. Considering the current environmental requirements due to the COVID-19 pandemic and the

enhanced internet connectivity of participants, the online survey process was found to be most relevant, convenient and efficient.

2.2 *Setting and samples*

The study was conducted in the regions of North Sumatra and Yogyakarta provinces of Indonesia. Yogyakarta is a province with the largest number of elderly people in Indonesia. Yogyakarta and North Sumatera are provinces in Indonesia which are located in two different islands so that these provinces have quite unique demographic differences. The majority of ethnic group in North Sumatra are Batakese and Malay, while the majority of ethnic group in Yogyakarta are Javanese. There were 208 respondents aged 60-90 years old who met the inclusion criteria. The sampling technique was nonprobability using a purposive sampling method. The inclusion criteria were older people who were willing to participate, able to communicate well in Indonesian language, stay in North Sumatra and Yogyakarta province, and could access the research questionnaire through social media platform such as WhatsApp. Research questionnaires were distributed using the help of the research assistants. The research assistant visited the elderly at the integrated elderly health service and accompanied them to fill out online questionnaires using whatsapp. For the elderly who do not participate in integrated elderly health service activities, the research assistants visited them to their homes to further assist them in filling out the questionnaire. This online survey was entirely voluntary and not for commercial purposes. The exclusion criteria disqualified those older people who experienced a decline in health status, causing them inability to respond to questions appropriately and accurately when the home visit was conducted.

2.3 *Measurements and data collection*

This study collected data about quality of life (QoL). The QoL in older people was measured using the World Health Organization Quality of Life (WHOQOL)-BREF questionnaire in the Indonesian version. This measuring tool is developed by the WHO. This instrument measures four essential components, namely the physical, psychological, social relation, and environment components (World Health Organization, 2012). This questionnaire consists of 26 questions. Two questions measure respondents' perception of their general quality of health (GQOL), and the remaining 24 questions measure QOL in four broad domains: physical (7 items), psychological (6 items), social relationships (3 items), and environmental (8 items). Each item is scored from 1 to 5. Higher scores reflected the higher quality of life. The WHOQOL-BREF has been widely used in Indonesia and has been proven as a valid and reliable questionnaire to be used in Indonesia (Purba et al., 2018). The Cronbach's alpha value for each domain of this questionnaire ranges between 0.41 and 0.77, while the Pearson's correlation coefficient ranges between 0.5 and 0.7 (Ch Salim et al., 2007).

Data collection was carried out in the territory of the Province of North Sumatra and Yogyakarta; the questionnaire was distributed online. Respondents provided informed consent in the first part of the questionnaire package before they filled out the online questionnaire through the Google platform during September to December 2020. All respondents were informed about the study objectives, nature, and administrative procedures. A total of 208 respondents participated in this survey voluntarily. All respondents reported demographic data and World Health Organization Quality of Life Scale (WHOQOL-BREF) instrument. Respondents could withdraw from the study at any time without providing any reasons. In this study, all respondents completed the instrument and no respondents withdraw.

2.4 *Data analysis*

The characteristics of respondents were presented using descriptive statistics. Quality of life were presented as means and standard deviation (SD). The collected data were tested for normality using the Kolmogorov Smirnov test ($p > 0.05$). The result showed that the data were abnormally distributed ($p = 0.00$ for physical domain; $p = 0.00$ for psychological domain; $p = 0.00$ for social domain; $p = 0.00$ for environmental domain). In bivariate analysis, Mann-Whitney was performed to correlate quality of life with retirement, family members affected by COVID-19, and communities in the neighborhood affected by COVID-19. Kruskal Wallis test was performed to correlate quality of life with age, living situation, health insurance, medical history. Inferences were drawn at a significant level of < 0.05 . A multiple linear regression test was conducted to

analyze the associated factors correlated with the quality of life, with a p -value less than 0.05 was considered statistically significant.

2.5 Ethical consideration

This study received ethical approval from the Research Ethics Committee, Sekolah Tinggi Ilmu Kesehatan Bethesda Yakkum Yogyakarta, Indonesia (No. 006/KEPK.02.01/X/2020). Prior to the study, the respondents were informed of the purpose of the study, the intervention, the benefits, and that the participation was voluntary; hence, all of them had the right to withdraw from the study at any time during the study period. All respondents provided informed consent in the first part of the questionnaire package before filling out an online-based questionnaire through the Google platform. Respondents could participate after understanding instruction and ticking agree option on the consent page.

3. Results

3.1 Demographic characteristics of the participants

Table 1 shows that the majority of respondents were female (53.8%), aged 60 to 74 years old (79.3%), retired (66.8%), married (64.4%), Christian (62%), Javanese (47.6%), living with a spouse partner (38.5%), had other type of medical history (45.7%), participated in integrated elderly health services (48.6%), had enough sleep at least six hours per day (89.4%), had a sports hobby (27.5%), had health insurance (86.1%), did not have family members affected by COVID-19 (to 97.6%), and did not live in a community affected by COVID-19 (87.5%).

Table 1. Demographic characteristics of the participants

Demographic characteristics		f	%
Gender	Female	112	53.8
	Male	96	46.2
Age (year)	Elderly (60-74)	165	79.3
	Old (75-90)	40	19.2
	Very old (>90)	3	1.4
Retirement	Yes	139	66.8
	No	69	33.2
Marital status	Married	134	64.4
	Divorce	2	1.0
	Widow	51	24.5
	Widower	16	7.7
	Single	5	2.4
Religion	Islam	42	20.2
	Christian	129	62.0
	Catholic	35	16.8
	Hinduism	1	0.5
	Buddhism	1	0.5
	Confucianism	0	0.0
Ethnicity	Javanese	99	47.6
	Bataknese	85	40.9
	Nias	17	8.2
	Balinese	1	0.5
	Chinese	1	0.5
	Toraja	1	0.5
	Minang	1	0.5
	Malay	1	0.5
	Padangnese	1	0.5
	Acehnese	1	0.5
	Spouse	80	38.5
	Children	27	13.0
	Spouse and Children	34	16.3
Living Situation	Spouse, Children, Grandchildren	28	13.5
	Alone	39	18.8

Table 1. Continued

Demographic characteristics		f	%
Medical History	Hypertension	40	19.2
	Diabetes Mellitus	17	8.2
	Rheumatism, gout	23	11.1
	COPD	7	3.4
	Diarrhea	1	0.5
	Disorders of the senses	1	0.5
	Ulcer	8	3.8
	Internal diseases	16	7.7
	Other	95	45.7
Social Activities	Integrated elderly health services	101	48.6
	Social Gathering	53	25.5
	Fellowship	32	15.4
	Other	22	10.6
Duration of Sleep	Enough	186	89.4
	Not Enough	22	10.6
Hobby	Reading	36	17.4
	Singing	15	7.2
	Cooking	22	10.6
	Watching TV	17	8.2
	Shopping	13	6.3
	Fishing	5	2.4
	Sewing	3	1.4
	Farming	39	18.8
	Sports	57	27.5
Health Insurance	Yes	182	87.5
	No	26	12.5
Family members affected by COVID-19	Yes	5	2.4
	No	203	97.6
The community affected by COVID-19	Yes	26	12.5
	No	182	87.5

3.2 Quality of life domains

The result of the analysis in Table 2 shows that the social domain had the highest score of quality of life of older people during the COVID-19 pandemic.

Table 2. Mean scores for quality of life domains

Domain	Mean(SD)
Physical	64.46(11.81)
Psychological	64.61(11.98)
Social	64.85(12.81)
Environmental	61.08(13.01)

3.3 Factors related to the quality of life

Bivariate analysis on factors related to the quality of life of older people during the COVID-19 pandemic is shown in Table 3. It reveals that factors related to the quality of life of older people during COVID-19 pandemic are age, retirement, living situation, health insurance, and medical history. Table 3 and 4 presents the results factors related to the quality of life of older people during the COVID-19 pandemic and multivariate analysis using the multiple linear regression analysis.

Table 4 shows the dominant factors related to the quality of life of the participants. The value used to identify the predictor factor that affect the quality of life of older people during COVID-19 pandemic was the *p*-value and standardized coefficient beta (β). The result of analysis shows medical history was the predictor factor that affects the quality of life of older people because it had the biggest β -value with 0.25

Table 3. Factors related to the quality of life of the participants

Variable	Score of QoL Mean(SD)	p-value
Age ^b (year)		0.03*
Elderly (60-74)	65.81(11.47)	
Old (75-90)	59.53(12.19)	
Very Old (>90)	56.00(0.00)	
Retirement ^a		0.00*
Still Working	60.48(10.92)	
Retired	66.44(11.77)	
Living Situation ^b		0.00*
Spouse	68.71(11.01)	
Child	58.22(10.78)	
Spouse & Child	64.65(12.10)	
Spouse, Child & Grandchildren	60.93(9.33)	
Alone	62.44(12.66)	
Health Insurance ^a		0.00*
Yes	78.12(9.28)	
No	87.32(9.13)	
Family Members Affected by Covid-19 ^a		0.92
Exist	68.80(19.77)	
None	64.35(11.61)	
Communities in the Neighborhood Affected by Covid-19 ^a		0.80
Exist	61.00(11.35)	
None	64.96(11.82)	
Medical History ^b		0.00*
Hypertension	56.68(10.10)	
DM	63.71(13.64)	
Gout Arthritis	56.35(10.11)	
COPD	65.29(12.34)	
Diarrhea	56.00(-)	
Sensory Disorders	75.00(-)	
Gastritis	59.38(10.53)	
Internal Diseases	59.19(9.47)	
None	71.07(9.04)	

Note: ^aMann-Whitney test; ^bKruskall-Wallis test; * $p < 0.05$ indicate statistically significant.

Table 4. Dominant factors related to the quality of life of the participants

	Variable	B	β	p-value	95% CI
1	Constant	74.00		0.00	67.15; 80.85
	Age	-2.66	-0.12	0.55	-5.39; 0.05
	Retirement	3.37	0.16	0.14	0.67; 6.06
	Living situation	-0.18	-0.03	0.65	-1.10; 0.64
	Health insurance	7.17	0.24	0.00	3.42; 10.92
	Medical history	0.68	0.24	0.00	0.32; 1.04
2	Constant	73.32		0.00	67.18; 79.45
	Age	-2.80	-0.13	0.39	-5.45; -0.14
	Retirement	3.49	0.17	0.10	0.86; 6.13
	Health insurance	7.22	0.24	0.00	3.48; 10.96
	Medical history	0.70	0.25	0.00	0.35; 1.15

Note: * $p < 0.05$; β -value multiple linear regression analysis

4. Discussion

This study aimed to identify the quality of life and factors affecting the quality of life of older people during the COVID-19 pandemic. In this study, the social domain has the highest score on the quality of life of older people. This result is supported by the data in this study that the majority of older people (48.6%) actively participated in integrated elderly health services.

Moreover, older people are also involved in some social activities such as social activities in the church and in the community. These findings are consistent with an earlier study which explained that social activities participated in by older people has an impact on their quality of life because older people can gather and discuss with each other (Jing et al., 2016). Social support obtained by older people can help older people to get better mental well-being (Kim & Lee, 2018).

Other factors involving support for older people in this study that had a high score in the social domain is the fact that the majority of older people are living with a spouse or family. This allows older people to get attention and spend their time with family without feeling lonely. This is in line with research conducted by Onunkwor et al. (2016) about older people in Kuala Lumpur who are living in a nursing home. The study reported that the score of the quality of life was low on the social domain. This is because older people living in nursing homes are older people who have been abandoned or neglected by their family. Social support and family give meaning especially when older people are faced with the conditions of the COVID-19 pandemic at this time. Due to the increase of support from friends and family members, a shared sense of and concern with the family can affect the feeling of peace and mental health (Zhang & Ma, 2020). In addition, older people continue to be actively involved in the family, allowing older people to have the space to do their hobby, focusing on their interest, and develop creativity within the sphere of the family (Putri et al., 2015). Besides this, the support of the family has a dominant influence on behavior related to the prevention of COVID-19 in terms of information delivery, being alert and motivated to always apply the preventive behavior (Kundari et al., 2020).

However, the results of this study are in contrast with the study conducted by Kumar et al. (2014) in India, in which the social domain had a score that was low, most of all the overall domain of quality of life. Meanwhile, a study conducted by Tel (2013) explained that older women in Turkey had lower scores in all domains of quality of life, namely physical, psychological, social, and environmental domain. This study result found that the lowest score was environmental domain. Previous research confirmed that as the COVID-19 pandemic progresses, older people avoid the habit of a regular medical examination to the hospital because they feel the fear of getting infected by COVID-19 from a hospital environment (Guida & Carpentieri, 2021). Modifications to environmental factors can help older people to improve their ability to take care of themselves (self-efficacy) so that it will help to increase their quality of life (Kumar et al., 2014).

In this study, age showed a significant relation in the physical, psychological and social domain. This study showed that most of the elderly were aged 60-74 years old. According to Onunkwor et al. (2016), as age increases, more physical disabilities in older people will appear. An advanced age will affect the quality of life of older people, and the greater the complaints or burden of symptoms felt causing lower quality of life (Klompstra et al., 2019; Mehra et al., 2020; Yuan et al., 2020). This is related to the lack of physical exercise ability of older people that would otherwise constitute an effective physical exercise therapy for most chronic diseases, while also avoiding mental and physical problems as the consequences of being quarantined during the COVID-19 pandemic, and preventing the risk of falling and cognitive decrease (Jiménez-Pavón et al., 2020). Physical activities of older people have a consistent positive relationship toward quality of life, although not in every domain such as sensory ability (Vagetti et al., 2014). During the COVID-19 pandemic, older people spend most of their time at home, and many of them feel bored, lonely, afraid and stressful. Physical activities can be done to counter the negative consequences of chronic disease and they even influence the mental and physical health of older people (Brooks et al., 2020; Jiménez-Pavón et al., 2020). This is supported by a research result stating that physical activities of older people during the COVID-19 pandemic can activate the immune system of older people. Thus, a good immune system will reduce the frequency of reactivation of the virus that causes COVID-19 and decrease physical dysfunction and mental stress (Damiot et al., 2020). This is in line with other research results which stated that physical exercise can improve the quality of life of older people (Kiik et al., 2018; Yuan et al., 2020).

Regarding health conditions, the majority of older people in this study had national health insurance, allowing them to be able to get health services. Having health insurance significantly affects the overall domain on the quality of life of older people. In this study, the majority of

older people use *BPJS*, which is the national health insurance provided by the Indonesian government. This health insurance helps older people to gain access to health services in the event of a decline in health status and better health monitoring especially older people who have chronic diseases.

The living situation of older people also represents a significant influence in all of the domains of quality of life. The majority of older people involved in this research live with their spouse or family. The presence of family members becomes one of the sources of social support that affect the quality of life of older people. This is because older people can rely on the family to resolve their limitations. Older people who have good social support will have good quality of life (Onunkwor et al., 2016). The result of research conducted by Putri et al. (2015) stated that older people who are living in a nursing home have a different quality of life compared to those living with the family. The quality of life of older people living with the family is better in terms of the physical, psychological, social and environmental domain. This is because older people living with the family have independence, are able to meet their social and economic needs, and are also directly involved in activities with the family. Family and community support make older people experience positive changes in their lives (Putri et al., 2015). This condition is also supported by a research result stating that there is a relationship between social interaction and the quality of life of older people in relation to older people's adjustment to whatever issues affect their current or future life (Andesty & Syahrul, 2018; Indrayani & Ronoatmodjo, 2018).

The factor that most affected the quality of life of older people during the COVID-19 pandemic was medical history. Those with history of disease had significantly lower quality of life scores in all domains. The medical history in this study such as hypertension, diabetes mellitus, rheumatoid arthritis, gout, and chronic obstructive pulmonary disease (COPD). Based on the results of the analysis, the obtained data showed that >50% of older people have comorbid diseases. The aging process that occurs in older people is also followed by various kinds of health problems, will cause physical weakness and various health problems (Sahoo et al., 2021). This is supported by a previous study which concluded that older people who are suffering from disease especially the chronic ones can have decreased mobility, affecting their daily lives, and making the life function decline become worse (Kwon et al., 2020). Medical history in older people will cause problems in physical and emotional aspects (Onunkwor et al., 2016). This conclusion is different from that of Indrayani and Ronoatmodjo's research that stated family support has the highest relationship with the quality of life of older people. The support and attention from the family give affirmation to older people, provide the needed sense of security and comfort, enhance self-confidence and motivation to deal with problems, and increase life satisfaction (Indrayani & Ronoatmodjo, 2018).

5. Implications and limitations

This study has implications for nursing and health policy to improve the quality of life of the older people during the COVID-19 pandemic. Understanding the factors affecting the quality of life of older people during the COVID-19 pandemic is important so that the older people need integrated health services that involve multidisciplinary and provide assistance for families as the main support system for the older people. Therefore, it is encouraged for the government and health care professionals, specifically community health nurses to promote the utilization of Integrated Elderly Health Service (IEHS) among older adults and families.

This study has limitations. First, its samples were collected from the regions of North Sumatera and Yogyakarta. The data collection was conducted via online questionnaires so representativeness could not be guaranteed. Second, older people as respondents had education level and lack of or difficulty in using smartphones and social media, such as WhatsApp.

6. Conclusion

In conclusion, the findings revealed the changing quality of life of older people during the COVID-19 pandemic. Age, retirement, living situation, health insurance, and medical history were significantly affecting their quality of life ($p < 0.05$). The predictor factor that affected the quality of life of older people during the COVID-19 pandemic was medical history. The findings of the study suggest that the government and health care professionals, specifically community health nurses need to promote the utilization of organized programs such as the Integrated Elderly Health Service (IEHS) among older people and their families.

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Author contribution

All authors (MRES, SRS, RCL) were involved sufficiently in the concept, design, data analysis, writing, and revision of the manuscript.

Conflict of interest

There is no conflict of interest in this study.

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ORIGINAL RESEARCH

Illuminating the Experience of Stigma among Persons Living with HIV using Participative Drawing Method



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Article Info	Abstract
<p>Article History: Received: 1 June 2022 Revised: 19 August 2022 Accepted: 20 August 2022 Online: 31 August 2022</p> <p>Keywords: Drawing, HIV stigma, PLHIV, Philippines, qualitative method</p> <p>Corresponding Author: Janet Alexis A. De los Santos College of Nursing, Visayas State University, Philippines Email: janetalexis.delossantos@vsu.edu.ph janetdelossantos1221@gmail.com</p>	<p>Background: Arts-based techniques such as drawing is a helpful means in research because of its potential to capture taboo, culturally sensitive issues, and other critical health experiences. However, very few studies integrate the use of drawing as a qualitative method in HIV research.</p> <p>Purpose: This study aims to explore the experience of stigma among persons living with HIV using the drawing method.</p> <p>Methods: The study utilized a participative qualitative approach. There were eleven (11) participants who were recruited through snowballing and were asked to draw their experience of stigma as a Person Living with HIV/AIDS (PLHA). The participants were men who-have-sex with men (MSM) who have been diagnosed for at least one year, and are active members of a support group. This preliminary study was conducted in Central Philippines from November-December 2019. The narrative explanations were recorded, transcribed, and analyzed using thematic analysis.</p> <p>Findings: Results revealed three themes: (1) Psycho-socio-emotional needs which illuminated their need for love and acceptance; (2) Profound feelings which reflected a plethora of negative towards positive convergence of emotions, and (3) Coping with HIV stigma which presented the three-pronged anchor to move forward and sustain a hopeful living.</p> <p>Conclusion: A stigmatized PLHIV needs intimacy, interconnectedness, and inclusiveness in society. Likewise, they feel a plethora of feelings that transcend negative to positive emotions depending on their coping. A PLHIV copes with stigma and discrimination through the aid of their social circle, spirituality, and self-love. Future researchers may consider the use of participative drawing to explore HIV stigma apart from the conventional interview, as it is found to be a valuable method of facilitating the expression of emotions and experiences.</p>

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1. Introduction

Stigma is an experience of negativity that may be self-internalized, community induced, or socially inflicted, such as deprivation of human rights (van der Kooij et al., 2021; Ibrahim et al., 2019). Organizations and advocates have shown efforts to mitigate the incidence of HIV stigma by implementing stigma reduction activities. A breadth of literature discussed a variety of modalities and approaches, and this includes emotional regulation (Wei et al., 2016), anticipated discrimination and self-disclosure (Olley et al., 2016), socio-ecological integration in information dissemination (Du et al., 2018) and stigma reduction training programs such as Acceptance Commitment Therapy (ACT) Training and Social Justice Capacity Building (SJCBC) (Li et al., 2018), and measuring and improving health worker's behaviors towards high risk groups (De los Santos et al., 2022a). Remarkably a reduction of incidence of HIV stigma in health facilities was found when interventions were focused on the health care providers (Nyblade et al., 2020; De los Santos, 2020). However, despite these endeavors, the stigma in HIV continues to exist and has been linked to the problems of patients' health-seeking behaviors, compliance, and adherence to treatment and rehabilitation (De los Santos et al., 2022b).

Although the literature discussed the genuineness of stigma experience, it revealed that there are no concrete stigma reduction activities and effective assessment modalities existing at present (Andersson et al., 2020). Notably, there is a scarcity of studies discussing how stigma is assessed.

The literature only presented the use of face-to-face interviews and Focus Group Discussion (FGD) in assessing HIV-related stigma and discrimination as an effective means of eliciting qualitative responses among its participants (Mahamboro et al., 2020; Reinius et al., 2021).

Scholars have suggested utilizing arts-based techniques such as drawing as a qualitative method in research because of its potential to capture taboo, culturally sensitive issues, and other critical health experiences (Gameiro et al., 2018; Literat, 2013). However, very few studies integrate the use of drawing as a qualitative methodology in HIV research. The existing studies are focused more on their capacity for knowledge generation. An example of this is a study by Mutonyi & Kendrick, 2011), who found drawing as an effective method to understand culturally sensitive topics such as sexual health and HIV/AIDS among the youth. The strategy was found to help construct a persons' understanding of HIV and helped the participants to arrive at a conclusion based on their personal experiences. Another is combining art into the patients' medical regimen, which has shown improvements in their physical and mental health and general quality of life (Tolleson & Zeligman, 2019). Drawing as a methodology fosters an in-depth expression of perception, thoughts, and views on a particular concept, which may be difficult when expressed through words, such as the experience of HIV stigma and discrimination.

With the seeming lack of literature focusing on exploring HIV stigma experience through the application of visual arts in health research, this paper intends to bridge this gap by qualitatively exploring the lived experience of stigma using the drawing method among men-having-sex with-men (MSM) PLHA.

2. Methods

2.1 Research design

This study utilized a participative, exploratory, descriptive qualitative design. Descriptive qualitative is considered an appropriate method to assess an experience to explicate the essence and peculiarity in the eyes of those who experienced it firsthand.

2.2 Setting and participants

This study was conducted in the Central Philippines between November-December 2019. The snowball method of member participation was employed to gather the target participants for this project. Inclusion criteria were MSM PLHA diagnosed for at least one year and an active HIV social support group member. Excluded were those with debilitating health conditions and new members with less than six months from the diagnosis. The researcher coordinated with the support group leaders of active HIV support groups regarding the study's intention. The leaders cascaded the recruitment intention to potential participants coming from their groups. A total of fifteen (15) participants agreed to participate in the drawing session. Data saturation was met at the eleventh participant which prompted decision to cease further data gathering.

2.3 Data collection

Prior to data gathering, the author did bracketing written in a separate journal to identify existing biases and assumptions to assure that data interpretation, is pure and grounded only on the gathered participants' responses.

The participants were gathered in a private room to hold the activity. Informed consent was sought before commencement, wherein only voluntarily agreeing participants signing the form were included in the sessions. The session observed a draw-and-talk sequence. The participants were provided with art materials (A4 paper, pencil, crayons, and colored pens). They were instructed to illustrate their lived experience of how they felt as a person living with HIV. They were also asked to prepare an explanation of their drawings and illustrations. The drawing session lasted 60-90 minutes, which was subsequently followed by group sharing. The participants were allowed to explain the details of their creative outputs central to their experience living with HIV. The participants were allowed to freely discuss using their native language to exhaust rich sharing of experience (Braun & Clarke, 2006). A voice recorder was utilized to record the sharing session facilitated by the researcher. The sharing session lasted for 10-15 minutes per participant.

2.4 Data analysis

The recording was transcribed and analyzed using inductive thematic analysis following Braun and Clarks' (Braun & Clarke, 2006) framework. The transcripts were initially transcribed

verbatim and later translated into English. A professor with an English major verified the translated transcripts to ensure the accuracy and coherence of the translation.

Data immersion was done through transcription reading and rereading process to identify embossed patterns that emerged from the data. Two inter-raters then coded the transcripts following the procedure of eclectic coding with a repertoire of values and emotions codes. The codes were grouped and clustered into one, along with the other narratives sharing the same thought or meaning. A review of the similarities and dissimilarities of codes/transcripts was done followed by the selection of highly relevant codes. Categorization into sections or themes was done thereafter. An expert reviewed the final codes and themes in qualitative research to guarantee the reliability of the data. Qualitative content and thematic analysis were the appropriate approaches in analyzing the qualitative data that were gathered in this study because it used a systematic process of coding, finding meaning, and thematization to describe a concept in a social context (Braun & Clarke, 2020; Byrne, 2021).

2.5 Trustworthiness/rigor

The qualitative rigor of this study was achieved by following the criteria of Qualitative Framework (Creswell & Miller, 2010). To gain the credibility of this study, the researchers performed members checking where the participants were invited to read, comment, change when necessary, and finally, agree on the derived findings of the study. The use of bracketing and journal writing likewise enhances the credibility and authenticity of the results of this investigation. The researchers followed an intercoder reliability check to minimize and avoid biases in the data analysis. This study's dependability and confirmability criteria were achieved through meticulous documentation and audit trail done by an external evaluator, and facilitating two data collection methods. The comprehensive description of the participant's background, experience, and quotes reinforced the transferability of this study.

2.6 Ethical consideration

This study observed proper ethical procedures and was cleared by the Ethics Review Committee of the St. Paul University Philippines with the code: 2018-01-PhDNS-11. The multilevel approach to the recruitment of participants ensured that the participant's participation in this study was voluntary. This was further strengthened by securing a signed informed consent form. The participants were assured of their confidentiality and anonymity in the outputs of the study. The researcher provided utmost privacy by organizing the session in a private facility. To secure the participant's safety, the researcher prepared a standby crisis management plan.

3. Results

3.1 Profile of participants

The majority of the participants were aged between 31-40 years old and were gays. There were 46% of the participants who claimed to be on the tertiary level of education. Most of the participants (55%) were diagnosed with HIV within the last two years (Table 1).

Three themes emerged after the textural analysis of the narratives derived from the sharing session. The themes were: (1) Psycho-socio-emotional longingness; (2) Profound feelings and; (3) Coping and holding on (Figure 1).

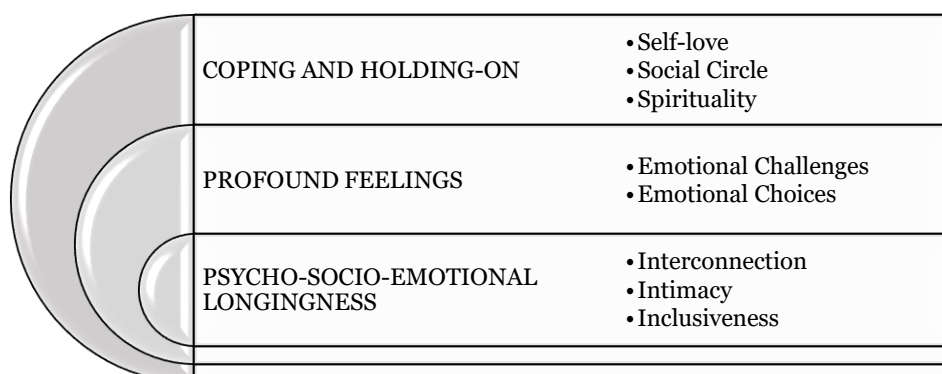


Figure 1. Themes and categories extracted from the experiences of a person living with HIV

Table 1. Profile of the participants

Demographics	Frequency	Percentage
Age (year)		
20-30	3	27
31-40	6	55
41-50	1	9
51-60	1	9
Gender		
Gay	8	73
Bisexual	2	18
Transgender	1	9
Educational Attainment		
High School graduate	2	18
College level	5	46
College graduate	4	36
Number of years diagnosed with HIV		
1-2	6	55
3-4	2	18
4-5	1	9
>5	2	18

3.2 Theme 1: Psycho-socio-emotional longingness

The session was able to extract a variety of longingness experienced by a person living with HIV. Most of the participants expressed literally and figuratively their need for love and acceptance. They yearned for a sense of belongingness, a nonjudgmental and nondiscriminatory treatment, respect, equality, unity, the open-mindedness of other people, and the protection of their human rights.

3.2.1 Longingness for interconnection

A participant expressed his dismay when his family ostracized him and told him to leave the house and how much he wished to be understood:

My mom did not make a fuss about it (my HIV diagnosis), maybe because she did not understand what it was about. That was what I thought until my brother learned about it. He told me to look for another place to stay. He sent me out of the house [...] For two weeks, I was roaming here and there. I went to some of my friends and rested there for a while, and sometimes I would sleep anywhere there was even a time I slept in the park [...]. It gave me some time to think. Sort of like a soul-searching. Nobody owns me anymore. I am all alone. I realized that even your own family would not be able to understand. (PL 07)

Despite being physically beaten by his mother because of his HIV diagnosis, like any child, he still longs for a motherly love:

My mother got mad at me. She became physical. I accepted all the slaps, blows, and kicks she did to me. I understand her because it is all my fault anyway. I was not careful. I did not take care of myself. I miss my mother; I miss being with her. (PLO8)

Typical to the participants is their disconnection with their peers. One participant expressed missing his friends.

I feel so alone now that my friends left me because they do not want to be associated with me. They do not want gossips that they, too, have HIV. Before I had this HIV, I had a lot of friends. I am easy to befriend with anyone. But now, I have no one. (PLO3)

3.2.2 Longing for intimacy

Being diagnosed with HIV is considered as a dead-end by a participant to forming romantic relationships. They believe they are unlovable because of their disease condition.

I fear that my boyfriend will break up with me if he finds out I am HIV+... If I lose this relationship, I know I won't be able to find another one knowing I am HIV+ [...], and I know I should tell him as it is my obligation. However, I am afraid he will break up with me once he finds out. (PL 02)

3.2.3 Longing for inclusiveness

The participants expressed being deliberately discriminated against because of their HIV status experienced by them and their family members. These experiences are common in their school, place of work, neighborhood, and even in healthcare facilities.

Going to school is a struggle because they feel that people there are discussing their HIV status. They prefer not to go to school out of fear of being judged. One participant became frustrated when his classmate, who is a close friend, told him that their schoolteacher asked the whole class if HIV was the reason why he was absent; at that time, he was admitted to the hospital. He said: *I felt humiliated, and I didn't want to go to school anymore. I don't want to face them after what they have done to me. I feel like going to school is stressful and useless. (PL 07)*

Another participant expressed how he was felt deprived of his right to education because he was HIV positive. He narrated: *It is too personal for me, mainly because I experienced discrimination when I was declined to study on my preferred degree program [...] They required blood screening tests as a requirement for enrollment, I know I have no chance. (PL01).*

Looking for a job is wearying for a person with HIV because some institutions require HIV screening for employment. The participants find this as discriminating and personally invasive. One participant was disheartened when applying for a part-time job to support his expenses for education:

I was disappointed to know when we were asked for an additional requirement of HIV screening test results from us applicants; I should not have applied in the first place had I learned about it earlier, so I will not be wasting my time, money, and effort. (PLO9)

Similarly, a participant experienced the same experience of discrimination when his supervisor told him that he would not be renewed of his contract because of his HIV status:

I was scared when my boss started to doubt my health, especially when I was admitted to the hospital and was diagnosed positive (of HIV). He said that I could not renew my expiring contract next month because I have this disease. (PL10)

Even in health facilities, participants felt stigmatized and discriminated against:

They placed me in a room where patients with rabies. They suspect me with a mental problem; that's why they put me there. Also, I felt they placed me there because I have HIV[...] I went to a hospital to have myself checked. I was bothered by my cough, which was two months already. The doctor prescribed a medicine for TB (Tuberculosis), and I felt they were already suspecting me as an HIV case as well. The doctor ordered the nurse to put a face mask on me while they all wore the same. I was offended because right in front of me. In my presence, they would spray a disinfectant in the room. I was hurt that that was how they treated me. They were disgusted with me. The wearing of a mask is fine, but the spraying of disinfectant is a different story. After all, they don't have a hold of my lab results yet. (PLO4)

The participants unanimously felt that they had been robbed of their right to liberty after being known as HIV positive. They receive this kind of treatment from their family members, neighbors, other people, and their community. He said: *Ever since I got diagnosed with HIV, I felt boxed. My brother would not allow me to be with my friends. I don't know; maybe he is just overly protective of me, but I think it is too much (PLO2)*

Another participant shared his painful experience being declined to commute on a vehicle for public use. He narrated: *I cannot go out to places where I want to go. The drivers of public utility*

vehicles would not allow me to ride, saying that I would spread HIV to the other passengers. (PL03)

There were stories that it is not only them who experience this discrimination but also include their other family members. One participant shared how he worries and feels sorry because their whole family is gossiped about. In verbatim, he said: *Ever since I got sick, my mother would always defend against anyone who would raise malicious issues about me, even her friends. I feel sorry for my mother. She lost her friends because of me.* (PL06)

3.3 Theme 2: Profound feelings

The results also revealed a breadth of emotions experienced by a person living with HIV. This includes a surge of positive and negative feelings. Remarkably, their feelings evolve from a negative towards a positive change.

3.3.1 Emotional challenges

Initially, there is denial, fear, self-blame, isolation, self-stigma, and perceived or actual discrimination. Two participants expressed their feelings of resignation:

I just let it be. I leave it as it is. I let myself fight on the worst disease ever experienced in my life until such time my body cannot take it anymore. I prefer to wait until I am in my worst, in my death bed, because I fear being stigmatized. It all boils down to my fear of rejection and shame. (PL 02)

I felt I was hopeless and had no chance in life, and I didn't want to fight anymore and see my parents suffer [...] I wanted to give up already. I even told my parents just to bring me home. I wanted to give up already and prayed for Him to take my life. (PL 04)

3.3.2 Emotional choices

Most of the participants go through the process of denial to depression until they can realize resilience, as displayed by their willingness to live and let go. Examples are the narration of PL01 and PL 10:

The tree that stands alone on this island represents me. I keep myself in isolation because that is how I feel as of now. I am hiding and not able to express myself freely. On the right side is the mainland, which represents my diagnosis of HIV and fears. I am far from accepting the real me, and I am far from letting people know what I am hiding; that is why I have to be away with it. What divides us is the wind and wave. The wind and wave represent the stigma and discrimination. The sun represents my ARV, which is my ticket to living a longer life. It tells me I have a future to look forward to every day. (PL 10)

My life is like a P100 bill, it may have been crumpled, stepped on, but its worth remains; it still can be used to buy from its value. Like me, I can be crushed, tumbled as a person because of what happened to me and my diagnosis, but yes, I am still the same me. That's why when I talk to a person now, I don't feel inferior anymore. I will not let myself feel down. I do not see myself as a dirty person nor a wrong person just because I have the virus. (PL 01)

3.4 Theme 3: Coping and holding-on

Most PLHIV have a good sense of self and spirituality. Their coping is anchored on different sources stemming from themselves, significant others, and their relationship with their God.

3.4.1 Spirituality

The participants draw strength in their belief in a spiritual being. In the absence of their family, the participants consider God as their ultimate source of hope and strength. One participant believed what saved him ultimately was a miracle from the Lord. He claimed: *Prayers were the key, and I believe it was a miracle. I relied on the Lord, and prayers became my weapon to fight my ordeals every day.* (PL 12)

PL 07 expressed how his need for love and acceptance from people around him and his spirituality inspired him to move on and live life despite the stigma he feels in dealing with other people and within himself.

In this drawing, I illustrated a drop of blood where God is found in the center. Because he is the center of my life now, with the help of my family, friends, and support groups, and my co-PL, I realized I should fight back, not lose hope and never give up on my dreams. My life is anchored on this bible verse from Proverbs: "I love those who love me and those who love me seek me. (PL 07)

3.4.2 Self-love

The participants consider themselves as a source of strength in coping with their illnesses and everyday challenges. The participants best explicate self-love through genuine efforts of staying healthy:

I may have encountered problems, but I don't make it a point to mess my life. As much as possible, I solve it myself. What matters to me is I am healthy, and I will not get any OIs (opportunistic infections). I always take care of myself and get fit as much as possible. I focused on myself, and I am always careful [...] I don't let gossip affect me because if I did, I might get stressed, and my body would be affected. (PL 09)

Another participant described his way of coping through self-empowerment, which helped him personally:

A time came when I had an opportunity to attend a Learning Group Session (LGS) with a psychiatrist as the speaker. I was enlightened. It was a wake-up call for me to get up and put my pieces together. I helped myself and applied everything I learned from the LGS. I forgave and accepted myself. I was able to remove the heavy chain in my chest, and I could unlock myself out of depression. (PL 02)

I am thankful for my strength. If not, it would have broken me down into pieces. Now I do not think about them too much, as long as I know that I am strong and capable and can support myself with whatever small things I have. Though deep inside, I would still feel hurt every time I felt they were gossiping about me. (PL 05)

3.4.3 Social circle

The participants also consider their family as their source of strength and motivation to fight their illness and move on with their lives.

I pretend to be strong, and I pretend that it does not affect me. As soon as I got home, I would cry to my mom, and she would console me. My mom's words are my anchor to make myself strong. She would always tell me to let it pass, that I just need to consider this a 'trend,' but time will come, and people will forget it... I held on to that until I was able to reach my graduation. (PL 02)

One participant expressed how disclosing his HIV status came to be one of the best decisions he made. This improved his coping and strengthened family relationship:

After I disclosed, I felt my burdened chest became a lot lighter. I felt free because I had a family to share it with. When I revealed my status to my family, they were able to help me more. Now, I feel closer to them. (PL 11)

Likewise, rebuilding relationships with peers helped participants cope with their illness and have a positive outlook in life:

I had a bad case of lung problems before, but now, I started to go out with my friends and have conversations with them. I feel I'm okay now that I have recovered and regained my

health. I feel I do not have the stigma anymore. What made me lose it was when my friends started to accept me and involve me back. (PL 03)

I tried before to open myself and tell everything to a trusted friend gradually. I told him about my situation and what this disease is all about. Thank God he understood me[...] I was expecting him to despise me, and yet it did not happen. He was able to have an open mind to accept me and to understand this disease. There I lost my stigma. (PL 1)

The participants expressed how being with their support group helped them understand their situation more and gave them a sense of purpose.

LGS (Learning Group Sessions) helped me. The members were my source of strength and determination to live. They convinced me to save myself by taking my medicines. It was so hard, but I endured all the itch and allergic reactions just to survive. When I attended the LGS, the group was able to convince me to take my meds. I started with my anti-TB drugs, then ARV after two weeks. (PL 05)

That is why when I hear the sad stories of a new co-PL, I can get strength from it to move forward. I feel inspired when I can save people. I convince them to be aware of their HIV status to get into treatment in the hub. I am happy to see them alive. It gives my life meaning and purpose. I can cope with my problems when I can relate it with people who also need help. (PL 01)

4. Discussion

The results revealed that HIV stigma is an experience that is real to a person living with HIV. The experience of stigma sheds light on the corporeal response of a person going through the process of emotional lability to stability. The derived themes were compared to existing studies.

4.1 Psycho-socio-emotional longingness of a stigmatized PLHIV

The majority of the longingness of a PLHIV were psycho-social and psycho-emotive in nature. The tripartite psycho-socio-emotional longing is most dominant primarily because stigma is an experience rooted in a person's social circle, which also explains their need for emotional safety as explained by their desire for acceptance and protection of their human rights. The need for love and acceptance is anchored in three dimensions. First is the longing for *intimacy*, or the desire to have or maintain a partner who will accept them despite being diagnosed with HIV. As the participants in this study, most PLHIVs are scared of the inability to form love and sexual relationship with a partner out of fear of rejection, devaluation, and abuse (Durbin et al., 2017; Handlovsky et al., 2022). The need for love and acceptance also roots in their tendency to remain socially and emotionally connected with their family and friends. This pertains to the need for *interconnection*. The family's primary function is to accept its members regardless of oddities and uncertainties challenged in the presence of HIV. Unfortunately, HIV stigma is not exempted even in the family. Although there are reports of untoward reactions of the family, the perceived stigma of the PLHIV himself remains as the main ingredient for nondisclosure of HIV status towards family and friends out of fear of rejection, ostracization, and maltreatment (Shrestha et al., 2019). At present, researchers are still trying to understand the complexity of HIV stigma. HIV stigma and discrimination as a phenomenon is too convoluted to decipher linearly because of its multiple socio-cultural issues and intersectionalities (Andrasik et al., 2020). Perhaps this explains why the need for *inclusiveness* has long been felt, yet a concrete approach and resolution have not been attained. The experience of discrimination and stigmatization by the participants of this study is similar to existing literature (Beck et al., 2017) which found that issues such as gender insensitivity, homophobia, prejudiced social classifications, and the blunt deprivation of human rights due to HIV diagnosis discriminatory experiences of a person living with HIV/AIDS. Based on these experiences are their need for love and acceptance, which is mainly resonated in their hope to be accepted equally in a society without prejudice and discrimination.

4.2 Feelings of a stigmatized PLHIV

A PLHIV experiences a collection of feelings that usually initiates denial, along with complex and perplexing negative emotions. The surge of feelings tests the sensibility threshold of a person, hence the term *emotional challenges*. Our results are similar to those found by several scholars who have contextualized the negativity felt by a person experiencing stigma, which affects the physical and emotional well-being (Andersson et al., 2020; Stockton et al., 2018). The negative feelings may include fear, self-pity, loneliness, desolation, depression, self, or enacted stigma, which leads to emotional changes in the life of a stigmatized PLHIV. The feelings of shame and guilt take over and are carried daily, which may afford no resolution, especially when the person remains closeted and lacks a support system (Cantisano et al., 2015; Heggeness et al., 2017). Mao et al. (2018) stressed the importance of having adequate support systems such as family, friends, and social services catering to the needs of a PLHIV to augment their general well-being. A healthy perception of social support makes them more adaptive to the challenges and changes they are experiencing. The stigma in a person with HIV harbors negative feelings longer because of the emotional tension, as they hurdle the physical and psychological burden of the disease.

Through the course of the denial to acceptance, a PLHIV is tasked to make life-changing decisions, and it is at this stage, he has to appraise his emotional competence, hence the term *emotional choices*. This is the period when a budding feeling of motivation starts to set in. A signal that the need for resolution is emergent, either to build resilience or to quit. There is a conflicting tug of war of feelings of holding on and letting go that they need to settle to move forward. Wei et al., (2016) suggested that recognizing and identifying these feelings will facilitate emotional understanding and, consequently, better coping skills. This is similar to the findings of Tuppal et al. (2019) explaining how a person living with HIV/AIDS goes through life stages, where choices are to be made to destroy and remain stigmatized or ascend the self from the emotional and life challenging consequences of HIV. This is the period of emotional chances. Emotional changes refer to the opportunity to live again, tainted but not destroyed, restructured, renewed, but remain as the same person through coping.

4.3 Coping with HIV stigma

A PLHIVs effective coping mechanism is lifted from their 3 S's of coping: Social Circle, Spirituality, and Self-love. A PLHIV copes with stigma through the help of his *Social Circle*. The social circle includes family and friends who can be sources of holistic coping and recovery. Maintaining a sound support system is vital to make a PLHIV more interactive, adaptive and cope effectively with his disease and stigma elimination. The involvement of family members in the course of therapy is proven to be effective in stigma reduction and enhancement of supportive relationships with a sick family member (Harrison & Li, 2019; Huang et al., 2019). Friends are necessary for positively influencing a person with an incurable illness (Doherty et al., 2019). Friends help provide ill persons' practical and psychosocial support, which is beneficial to the process of coping among those suffering from serious conditions such as HIV.

On the other hand, *Spirituality*, as a coping mechanism, involves a connection or a relationship with an eternal being much greater than the self. A PLHIV copes with his stigma by creating a solid spiritual foundation with God and enriching it through prayers. Studies have supported the essentiality of spirituality in reducing anxiety and the development of hope and well-being of a person undergoing a challenging time (DiPierro et al., 2018; Philip et al., 2019). Fundamentally, coping through his religion and having a sense of spirituality is beneficial to a person living with stigma because it aids in their psychosocial and cognitive functioning.

The essential coping, which is considered the key to unlocking and releasing the tension of stigma, is *Self-love*. Self-forgiveness is a form of self-love that entails emotional freedom. For a PLHIV to be genuinely free, is to focus on the self and disregard what other people say and think. To self-love is to be at peace with the self, which is attained through self-acceptance, self-forgiveness, and self-efficacy. Forgiving of self is necessary to relieve the psycho-emotional stress resulting from the stigma and, at the same time, has been proven to improve health and well-being (Sezgin & Erdoğan, 2018). This indicates that persons who have forgiven themselves have improved their self-efficacy, primarily because of their willingness to perform tasks to uplift their morale out of their motivation. It indicates effective coping when a PLHIV considers compliance and adherence to his ART an essential responsibility.

5. Implications and limitations

Participatory drawing techniques may be integrated by health practitioners in their care for clients with HIV, especially the newly diagnosed and are in the process of adjusting to their disease condition. The enjoyable and entertaining character of the participative drawing-sharing session facilitated the voicing and articulation of rich qualitative information of PLHIVs' life experiences on HIV stigma. The sharing session allows fluidity of expressing their deepest emotions, and to share more of their experiences knowing that their peers share the same feelings of stigma experience. The use of art in HIV research and its integration in the care of PLHIVs is an authentic and ethically sound method because of its inherent potential to legitimately illuminate the personal and lived realities as they become engaged and engrossed to produce a visual craft from their creativity. Participative drawing as a qualitative method in assessing HIV stigma is adequate to illuminate an in-depth expression of the participants' lived experiences, emphasizing their perceptions, thoughts, views, and feelings. The illuminated experiences of stigma in this study provide a lens to practitioners on how to assist PLHIV clients in their needs effectively, coping with their disease, selecting healthier options, and living a meaningful life.

This study is limited to only a specific group of MSMs who were members of a support group. Considering the closeted nature of PLHA, the researchers opted to seek the aid of support groups leaders to ensure recruitment of participants. Future researchers are encouraged to assess other groups to determine the usability of drawing to determine a PLHIVs lived experience of stigma. Second, the data collection was lifted only from the different experiences of the available participants, future researchers may do participant triangulation involving various PLHA coming from different groups such as commercial sex workers, sea farers and others on high-risk groups. Given the limitations, the findings of this study may be considered preliminary.

6. Conclusion

The study adds to the body of knowledge on the usefulness of applying a participatory approach and visual art in health, particularly in HIV/AIDS research. For a stigmatized PLHIV, they yearn the sense of belongingness, respect, and nondiscriminatory treatment to practice their rights as persons. The experience of stigma results in feelings and responses that evolve from negative towards positive adaptation through self-help and coping with spiritual and support systems. This study acquired the usability and facility of drawing to facilitate the expression of PLHIVs' experiences and thoughts on stigma. Future researchers may consider integrating participative drawing method to explore intensively and expound participants narratives in explicating their lived experiences.

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Conflict of interest

The author declares no conflicts of interest relative to the release and publication of this manuscript.

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ORIGINAL RESEARCH

Mediation Role of Perceived Organizational Support on Nurses' Work Engagement and Leadership Styles



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Article Info	Abstract
<p>Article History: Received: 19 April 2022 Revised: 22 July 2022 Accepted: 26 July 2022 Online: 31 August 2022</p> <p>Keywords: Leadership styles; nurses; POS; work engagement</p> <p>Corresponding Author: Aida Mehrad Department of Basic, Developmental and Educational Psychology, Faculty of Psychology, Universitat Autònoma de Barcelona, Spain Email: mehrad.aida@gmail.com</p>	<p>Background: Nurses' work engagement is essential both for the quality of the service provided and occupational health. However, there is a lack of adequate information about nurses' engagement in healthcare organizations that are affected by various factors in the context of Health Psychology.</p> <p>Purpose: This study was aimed at investigating the association between leadership styles of supervisors and work engagement, and elucidating the role of organizational support in this relationship.</p> <p>Methods: A cross-sectional study was conducted on 85 nurses from the health organizations in Catalonia, Spain, recruited via a snowball procedure. Leadership styles and Three Outcome Scales (TOS) were evaluated through the Multifactorial Leadership Questionnaire (MLQ) as independent variables. POS as an Organizational Support Test assessed a mediating variable (POS), and work engagement as a dependent variable was evaluated by the Utrecht Job Involvement Scale (UWES).</p> <p>Results: The results displayed differences in work engagement depending on job positions. Besides, the results revealed a positive association between leadership styles and TOS with work engagement, other than laissez-faire. Additionally, POS illustrated a positive association with work engagement ($r=0.447$, $p<0.01$). Leadership styles except for laissez-faire and TOS positively affect POS; also, TOS significantly predicted work engagement ($\beta=0.581$, $t(78)=2.196$, $p<0.05$). Furthermore, results confirmed that POS mediates the relationship between leadership styles and TOS with work engagement ($z=-3.490$; $z=3.117$; $z=3.521$; $z=3.791$, $p=0.000$).</p> <p>Conclusion: Transformational and transactional leadership are two main styles significantly affecting nurses' engagement with their work, while laissez-faire decreases nurses' work engagement; therefore, supervisors and leaders of healthcare organizations should consider it. Consequently, nurses with a high POS show superior engagement levels at work. The research sheds new light on health psychology and the clinical area, particularly in nurses' work engagement.</p>

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1. Introduction

Most organizations try to change their structure and enhance themselves based on new movements in the current global business world. Corresponding to this strategy, these organizations must distinguish human improvement factors and efficiently apply them. There are several factors, such as employees' job satisfaction, which is assumed to be a combination of physiological and psychological items that employees feel satisfied with (Mehrad & Fallahi, 2014). Kind of work, co-workers, supervisors or subordinates, payment, incentives, and organizational communication have an intense role on organizational outcomes and increase its level remarkably, which should be recognized (Eslami & Gharakhani, 2012).

In recent years, one of the primary and critical organizational factors that have been considered more is employee work engagement, which has increasingly expanded its status as a legitimate construct among academic scholars (Strom et al., 2014). Work engagement is probably the oldest and most common concept of workplace well-being (Wang et al., 2016). By

knowing the critical role of work engagement, Engelbrecht et al. (2017) explained that engaged employees are more creative, enjoy their work, and are more well-organized. In contrast, Manning (2016) reported that employees who are not engaged and empowered in their work are more likely to become unsatisfied with their work and show a high turnover. To display the imperative role of work engagement, Lu et al. (2018) clarified that work engagement is assumed as a stable work condition that can move between employees at the workplace. The researchers also explained that it likewise as an influential factor has a positive relation with individual task performance, appropriate presentation, observed behaviour, personal work-family facilitation, job satisfaction, and subjective well-being (Lu et al., 2018). Therefore, it is essential to realize the influential factors that impact work engagement.

Firstly, it is necessary to emphasize that nurses are a key and essential resource that must be considered in any health systems (Martínez-Zaragoza et al., 2017). They make up the largest group of healthcare specialists (Sekse et., 2018) that Baker and Alshehri (2020) correspondingly explained and emphasized this important fact at the hospital. Work engagement among nurses was wide-ranging in different hospital wards. Low levels of work engagement were linked to poor workers, such as increasing burnout, reduced intention to remain and career satisfaction, and patient outcomes, such as low patient outcomes and increased adverse events. So, the health care organization needs to provide adequate support for nurses that can lead to work engagement and a high-performance level (Havens et al., 2018). Furthermore, the predictors of work engagement among nurses were mainly comprised of demographic data (such as sex, age, and occupational tenure), job-related variables (such as job stress, role ambiguity, and organizational support), workplace-related (practical and dynamic environment) (Wan et al., 2018), and personal factors (such as personality, self-efficacy, and coping style) (Cao & Chen, 2019). Considering the importance of nurses' work engagement at health care organizations, distinguishing influential factors on it can be valuable. In this regard, focusing on the impact and role of managers' leadership styles as independent variables and POS, two main organizational factors significantly contribute to nurses' work engagement in this study; in the systematic review of this research by Mehrad et al. (2020), this point was clear.

Leadership is a process through which an individual influences people to attain common goals (Saleem, 2015). Also, leadership style is assumed as one of the human-resource-related outcomes and perhaps one of the most studied management and organizational psychology topics (Fiaz et al., 2017), which has a direct relationship with employees' responses and organizational behaviour in the workplace (Mehrad et al., 2020). Laissez-faire, transactional, and transformational as three basic leadership styles (dependent variables) in the present study will examine their relationship with POS (mediator of the study) and nurses' work engagement (dependent variable). Transactional leadership style refers to the exchange association between leader and employee, in which each party is involved to meet their respective self-interests. Each party's interests are met by clarifying employee responsibilities, leader's expectations, and compliance benefits (Strom et al., 2014). Transactional leadership is a dynamic exchange between leaders and subordinates (Keskes, 2014). Besides, the transformational leadership style concentrates on leaders' ability to interact, understand, and support employees beyond the standard employment exchange. Depending on situational conditions, these leaders may take on roles such as facilitator, mentor, and innovator, which may arise due to personal disposition. Generally, the transformational leadership style includes behaviours that encourage employees to take various views on their work and challenge them to endeavour new approaches (Henker et al., 2015). The study of Lapeña et al. (2017) also demonstrated that transformational and transactional leadership styles significantly contribute to nurses' satisfaction and high level of performance.

Likewise, TOS, which includes extra effort (EEF), the effectiveness of a leader's behaviour (EFF), and satisfaction (SAT) with their respective leader, play an influential role in appearing work engagement. Conversely, the laissez-faire style has been focused on leaders who choose not to guide performance. Employees are given the freedom to operate without a leader's influence when the situation would usually demand that they do so. The leader is, in most cases, left with only the communication role for facilitation. This leadership behaviour is the most ineffective and inactive and is strongly associated with employee dissatisfaction, conflict, and ineffectiveness (Al-Sayah, 2011). Considering the role of leadership styles among nurses,

Specchia et al. (2021) explained that nurses will satisfy and engage in work by applying transformational leadership in contrast with Laissez-faire.

Another organizational factor that has an outstanding contribution to work engagement is POS. It is defined as general beliefs regarding how employees perceive that their organization pays attention to their well-being and values their contributions. When employees have confidence that the organization helps and supports them, they will produce high POS. Overall, employees with higher POS are believed to have a positive work attitude and behaviour (Ayuningtias et al., 2019). POS can help nurses exhibit a positive attitude, make ethical decisions, increase their commitments, influence turnover intention, and decrease job stress. In general, POS meaningfully predicted task performance, optional performance, and particular future career aspirations of employees in the work environment (Duyar & Aydin, 2012).

According to the earlier investigations towards leadership styles, work engagement, and POS; also, their relationship together, findings showed that still there is a lack of adequate information about nurses' work engagement at healthcare organizations. The previous investigations focused individually on the role of leadership styles and POS on work engagement. In contrast, in this research, essential styles and support of organizations are assumed as the primary point and aim that elaborate and increase the level of nurses in the health system and endeavour to focus. This study specifically focused on the mediation role of POS between transformational, transactional, laissez-faire, and work engagement. Generally, the research attempted to focus intensely on the role of nurses' work engagement influenced by organizational factors such as leadership styles, perceived organizational support (POS), and three outcome scales (TOS). Accordingly, the researcher focused on this area to fill this gap in the context of Health Psychology and find the principal and positive factors that can increase nurses' engagement and level of well-being. Overall, this study aimed to investigate the association between leadership styles of work engagement and POS among nurses.

2. Methods

2.1 Research design

The present study's research design is based on a cross-sectional design, and all the data are collected simultaneously. The data from a different group of nurses who worked concurrently in the Catalunya area's various health systems had been collected.

2.2 Setting and samples

A sample is determined as a subdivision of a population adapted to the study. In truth, examining all members of a particular population is impossible. Furthermore, selecting a sample based on a specific population is wise. Knowing the total population is imperative, and the study's exact sample can be determined based on the entire population (Mehrad, 2015). According to this knowledge, the research participants were 85 nurses (male and female) who worked in healthcare organizations in Catalonia, Spain, collected via a snowball sampling technique. This number of participants in the snowball technique was evaluated, and there was no precalculated list of target population details which is the nature of the snowball technique. This method is assumed to be a recruitment technique in which study participants can help researchers identify other potential subjects (Ballo & Alphonsine, 2018). The present research's sample size originated from population nurses working at healthcare organizations in Catalonia, Spain. The Spanish version of the questionnaires was sent to the participants as an online questionnaire; then, the nurses filled the questionnaires optionally. In this research, Snowball has worked from nurse to nurse, providing confidence in the source of invitation to participate. Since the invitation to participate did not come from the organization where they worked, the bias of seeking approval from supervisors has been removed, and total anonymity has been facilitated sincerity.

2.3 Measurements and data collection

The research comprised antecedent, independent, dependent, and mediator variables measured by instruments explained in detail in the following sections. The first section of the instruments is socio-demographic information on respondents' backgrounds. They included age, gender, marital status, work experience in years, place of residence (province), and work position (hospital care, primary and community care, socio-healthcare, and teaching &

research). The second section is designed to investigate leadership styles and three outcome scales by MLQ; the third section considers examining the work engagement by UWES. Finally, the fourth section measured POS by the POS questionnaire. All research questionnaires were in Spanish and adapted for the Spanish population.

2.3.1. Work engagement (UWES)

This research measured work engagement as a dependent variable and used the Utrecht Work Engagement Scale (UWES) developed by Schaufeli and Bakker (2003). This tool has 17 items and has a seven-point scale ranging (Never=0, Almost Never=1 (A few times a year or less), Rarely=2 (Once a month or less), Sometimes=3 (A few times a month), Often=4 (Once a week), Very often=5 (A few times a week), Always=6 (Every day)) (Schaufeli & Bakker, 2004). This questionnaire asks about employee feelings at work. Schaufeli et al. (2006) reported that vigour has six items, dedication has five items, and absorption has six items. The reliability of UWES according to Cronbach's alpha of this study was 0.759, which was acceptable. Additionally, according to the original version, Cronbach's alpha of 0.84 in the vigour dimension, 0.89 in dedication, and 0.81 in absorption. The instrument has been validated in various countries such as Greece (Xanthopoulou et al., 2012) and Spain (Garcia-Sierra et al., 2016). The translation of instrument to Spanish was accomplished separately by two bilingual researchers in the field. Subsequently, the validity of both instruments was evaluated by inviting three experts in the field. Although, the Content Validity Index (CVI) of both translations were adjacent to each other, we selected the translated instrument which has better CVI which is 0.65 (Yusoff, 2019).

2.3.2. Leadership Styles & TOS (MLQ)

For measuring leadership styles and TOS as independent variables in the present research, the MLQ proposed by Bass and Avolio (1995) has been used, translated to Spanish by expert researchers, and reliability and validity have been considered. This questionnaire included 45 items that scored between 0-4 (0=never to 4=usually) and measured transformational, transactional, laissez-faire styles, and TOS. Transformational has 20 items, transactional has eight items, laissez-faire has eight items, and TOS has nine items. According to Cronbach's alpha of this study, the reliability of transactional leadership was 0.868, transformational leadership was 0.967, laissez-faire was 0.895, and TOS was 0.949, which were acceptable. Furthermore, the original version showed Cronbach's alpha of 0.74-0.97. Likewise, the instrument has been utilized by Berger et al. (2012), Manning (2014), and García-Sierra and Fernández-Castro (2017) likewise applying MLQ for their investigations. The content validity was calculated by inviting three experts in the field of leadership and hospital management. The experts were asked to rate the relevance and clarity of items in the instrument. The calculated CVI was 0.65, signifying that the tested tool measures what it intends to measure (Yusoff, 2019).

2.3.3. POS

The Spanish version of POS proposed by Ortega (2003) clarified measuring the POS as the mediator of this research. This Spanish version included 17 items and comprised a 7-point Likert scale (1=strongly disagree, 7=strongly agree). The reliability of POS according to Cronbach's alpha was 0.753, which was acceptable. According to the original version, Cronbach's alpha showed 0.93. Also, the instrument has been validated and used by researchers such as Alcover et al. (2018). The CVI of the instrument was calculated by inviting 3 experts in the field; the result showed 0.7 of content validity (Yusoff, 2019).

The data collection is fundamental to this research, designed based on quantitative methods. This research's objectives required preliminary information on respondents' backgrounds, leadership styles, TOS, work engagement, and POS via standardized questionnaires that collected essential data to answer the research questions. The Spanish version of the questionnaire was sent as an online questionnaire via email and WhatsApp to nurses. This data collection was conducted from 17 May 2019 to 15 March 2020 among the nurses working in healthcare organizations in Catalonia, Spain.

2.4 Data analysis

T-test and ANOVA were performed to investigate the differences in nurses' work engagement between socio-demographic factors. The research measures the mediatory role of POS on the relationship between leadership styles, TOS, and work engagement. Descriptive statistics, Pearson correlation coefficient analysis, multiple linear regression analysis, and mediation analysis (Sobel Test) were utilized.

2.5 Ethical consideration

The research requested informed consent, that it was voluntary, that the participants could abandon it at any time, and that it was anonymous since at no time did it generate customized databases (with no personal data). Additionally, this Research followed the code of good practices (Agreement of the Governing Council 30 January 2013) of the Ethics Committee in Animal and Human Research (CEEAH) of UAB. The research likewise exactly persuaded part of the Research involving people from CEEAH.

3. Results

3.1 Differences in work engagement between socio-demographic factors based on t-test and ANOVA results

By considering the critical role of nurses' work engagement in health systems and their different socio-demographic factors, finding differences by using t-test and ANOVA were performed in this research, illustrated in Table 1.

Table 1. Differences in work engagement between socio-demographic factors based on t-test and ANOVA results (n=85)

Variable	f	Mean(SD)	t	p
Marital Status				
Married	51	165.66 (36.30)	0.724	0.471
Unmarried/Other	32	159.96 (32.47)		
Work Experience				
>15 years	66	162.15 (34.83)	0.615	0.540
<15years	18	167.83 (34.25)		
Residence (Province)				
Barcelona	56	166.87 (35.86)	1.20	0.231
Other	29	157.37 (31.25)		
			F	
Age				
Under 35	8	164.25 (38.85)	0.908	0.407
36-50	36	169.22 (36.92)		
51 and older	41	158.60 (31.36)		
Gender				
Female	75	164.22 (34.72)	0.299	0.826
Male	7	154.71 (34.35)		
Other	2	161.50 (48.79)		
Work Position				
Hospital Care	46	156.13 (34.98)	2.87	0.04
Primary & Community Care	22	164.50 (34.36)		
Socio-Healthcare	7	190.71 (13.48)		
Teaching & Research	10	177.30 (32.00)		

Notes: t = t-test; F = F-test (variation between sample means / variation within the samples).

Table 1 reveals no significant difference in work engagement in the function of marital status; also, there was no meaningful variation in work engagement and years of work experience; similarly, there was no significant disparity in work engagement and residence. Therefore, calculating the Cohen's effect size is unnecessary for this part of the t-test analysis. Additionally, Table 1 shows the results of one-way ANOVA that exposed a meaningful difference between work position groups and work engagement. Cohen's effect size ($\eta^2=0.32$) also suggested a medium effect size; the difference between work engagement and work position is

acceptable. Tukey Post-hoc displays that work engagement varies among different work position groups. The Tukey Post-hoc test (LSD) results illustrated significant differences in nurses' work positions who were working in the socio-healthcare and hospital care positions at 0.05 level. The nurses who worked in socio-healthcare positions experienced a significantly higher level of work engagement ($M=190.71$, $SD=13.48$) than those in the hospital care group ($M=156.13$, $SD=34.98$). In contrast, primary & community care and teaching & research groups were not statistically significantly different from the other groups. On the other hand, the findings of the ANOVA test showed that there are no significant differences between age groups and work engagement ($F(2, 82)=0.908$, $p=0.407$); as well, the results showed there are no meaningful differences between gender groups and work engagement ($F(3, 81)=0.299$, $p=0.826$).

3.2 Relationships between leadership styles, TOS, POS, and work engagement

In this research, to find the relationships between leadership styles, TOS, work engagement, and POS, Pearson correlation had been applied. Table 2 illustrates these results.

Table 2. Pearson Correlations between leadership styles, TOS, POS, and work engagement

Variables	1. WE	2. POS	3. TAL	4. TFL	5. LF	6. TOS
1. WE						
2. POS	0.447**					
3. TAL	0.257*	0.431**				
4. TFL	0.329**	0.530**	0.880**			
5. LF	-0.356**	-0.522**	-0.667**	-0.691**		
6. TOS	0.425**	0.616**	0.844**	0.912**	-0.681*	

Notes. * $p<0.05$; ** $p<0.01$; WE=Work Engagement; POS=Perceived Organizational Support; TAL=Transactional Leadership; TFL=Transformational Leadership; LF=Laissez Faire; TOS=Three Outcome Scales

Table 2 reveals that there was a positive association between TOS ($r=0.616$, $p<0.01$), transactional leadership ($r=0.431$, $p<0.01$), and transformational leadership ($r=0.530$, $p<0.01$), with POS; on the other hand, there was a negative association between laissez-faire ($r=-0.522$, $p<0.01$) with POS. The results showed a significant association between work engagement and POS ($r=0.447$, $p<0.01$). In addition, the findings released that there is positive association between TOS ($r=0.425$, $p<0.01$), transactional leadership ($r=0.257$, $p<0.05$), and transformational leadership ($r=0.329$, $p<0.01$), with work engagement; on the other hand, there was a negative association between laissez-faire ($r=-0.356$, $p<0.01$) with work engagement.

3.3 Predictors of work engagement

Multiple linear regression analysis was applied to investigate and determine leadership styles, TOS, and POS predictors of nurses' work engagement. The research's variables were likewise tested for the multivariate analysis's assumptions. Table 3 illustrates the result of multicollinearity and multiple linear regression analysis for work engagement.

Table 3. Results of Multicollinearity and multiple linear regression analysis for work engagement

Variable	Collinearity Statistic		B	SE	β	t	p
	Tolerance	VIF					
(Constant)	0.134	7.474	153.969	28.836		5.339	0.000
TOS	0.123	8.110	2.051	0.934	0.581	2.196	0.031*
TFL	0.198	5.058	-0.372	0.480	-0.214	-0.776	0.440
TAL	0.469	2.133	-1.148	1.037	-0.241	-1.106	0.272
LF	0.559	1.789	-0.671	0.628	-0.151	-1.070	0.288
POS	0.134	7.474	0.163	0.092	0.228	1.760	0.082

Notes: $F(5.78)=5.76$; * $p<0.05$, $R=0.52$; $R^2=0.27$; Adjusted $R^2=0.22$

Table 3 illustrates that the tolerance of variables was between 0.123 to 0.559, and the amount of VIF ranged from 1.789 to 8.110. Based on these results, there is no multicollinearity among variables. Additionally, Table 3 displays the results of multiple regression analysis to

work engagement, indicating that all the independent variables in the equation explained (27%) of the variance. The findings show that among factors of leadership styles, TOS, and POS, only TOS has a significant proportion of variance in work engagement scores ($R^2=0.27$, $F(5, 78)=5.76$, $p<0.05$). As displayed in Table 3, it was found that TOS ($\beta=0.581$, $t(78)=2.196$, $p<0.05$) significantly predicted work engagement.

3.4 Mediation effect of POS on relationships between leadership styles, TOS, and work engagement

This research performed a series of regression analyses to examine POS's mediating effect on the relationships between leadership styles, TOS, and work engagement. Before the examination, the assumptions of mediation have been analysed. Table 4 shows all mediating tests by leadership styles and TOS on work engagement through POS.

Table 4. Mediating test of leadership styles and TOS on work engagement through POS

IV	DV	B	SE	β	T	p
LF	POS	-3.249	0.586	0.522	-5.54	0.000**
POS	WE	0.319	0.071	0.447	4.525	0.000**
LF	WE	-0.671	0.628	-0.151	-1.070	0.288
TAL	POS	2.879	0.665	0.431	4.326	0.000**
POS	WE	0.319	0.071	0.447	4.525	0.000**
TAL	WE	-1.148	1.037	-0.241	-1.106	0.272
TFL	POS	1.293	0.228	0.530	5.663	0.000**
POS	WE	0.319	0.071	0.447	4.525	0.000**
TFL	WE	-0.372	0.480	-0.214	-0.776	0.440
TOS	POS	3.045	0.431	0.616	7.072	0.000**
POS	WE	0.319	0.071	0.447	4.525	0.000**
TOS	WE	2.051	0.934	-0.581	2.196	0.031*

Notes. B = Unstandardized beta; β = Standardized beta; ** $p<0.01$, * $p<0.05$

Figure 1 illustrates the mediation of POS between laissez-faire and work engagement. According to the results POS fully mediates the relationship between laissez-faire and work engagement.

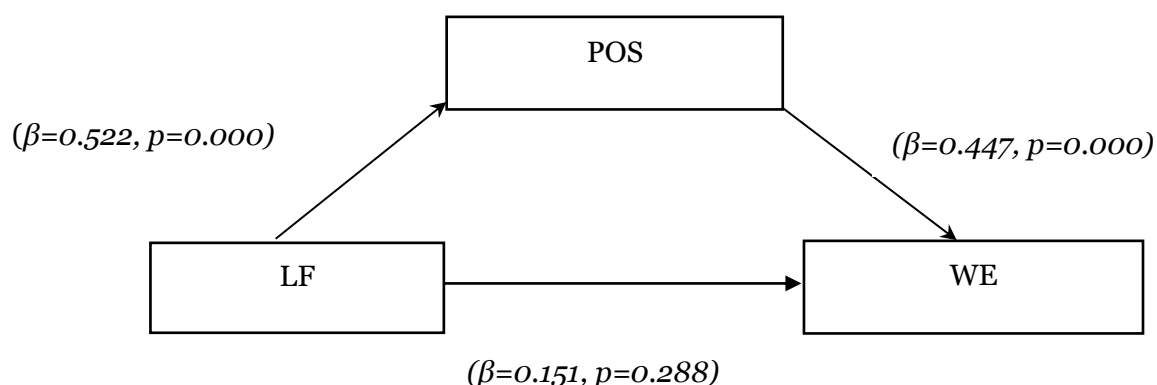


Figure 1. The mediating role of POS on the relationship between laissez-faire and work engagement

Figure 2 shows the mediation of POS between transactional leadership and work engagement. By the results POS fully mediates the relationship between transactional leadership and work engagement.

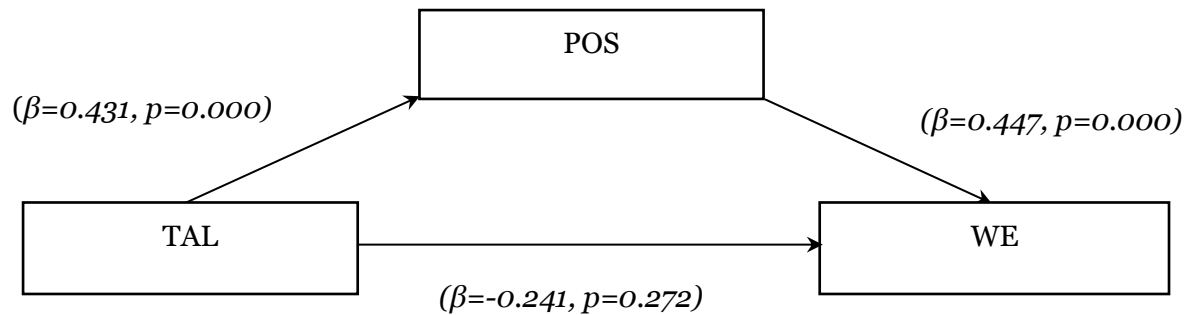


Figure 2. The mediating role of POS on the relationship between transactional leadership and work engagement

Figure 3 presents the mediation of POS between transformational leadership and work engagement. The results show POS fully mediates the relationship between transformational leadership and work engagement.

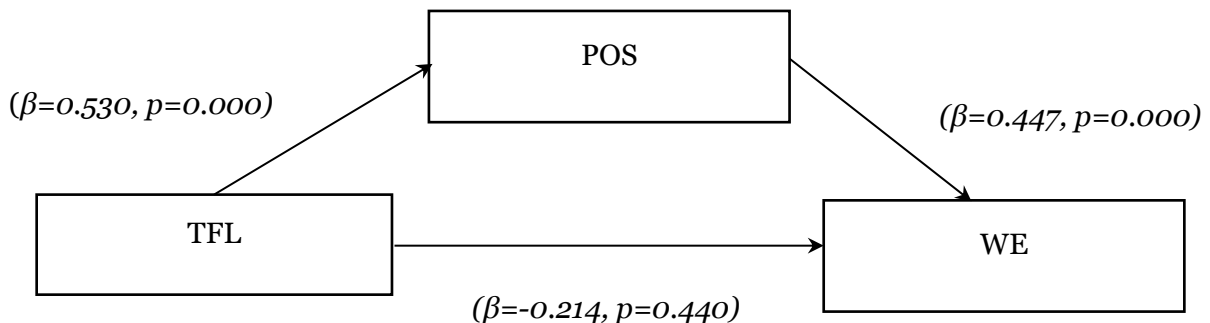


Figure 3. The mediating role of POS on the relationship between transformational leadership and work engagement

Figure 4 indicates the mediation of POS between TOS and work engagement. The results proof POS fully mediates the relationship between Three Outcome Scales and work engagement.

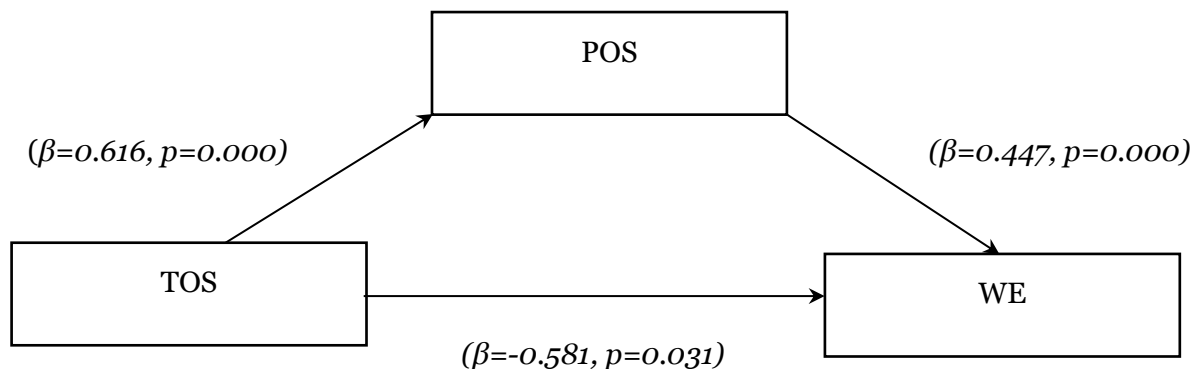


Figure 4. The mediating role of POS on the relationship between TOS and work engagement

Table 4 shows the direct effect of laissez-faire on work engagement (\hat{c} path) is not significant ($b=-0.671, p=0.288$). Conversely, the direct effect of laissez-faire on POS (a path) is significant ($b=-3.249, p<0.01$). In addition, the relationship between POS and work engagement (b path) is also significant ($b=0.319, p<0.01$). Thus, POS fully mediates the relationship between laissez-faire and work engagement. The Sobel test calculation likewise displayed that the indirect effect of laissez-faire on work engagement is statistically significant ($z=-3.490, p=0.000$).

In addition, Table 4 demonstrates the direct effect of transactional leadership on work engagement (\hat{c} path) is not significant ($b=-1.148, p=0.272$). Conversely, the direct effect of

transactional leadership on POS (a path) is significant ($b=2.879, p<0.01$). Also, the relationship between POS and work engagement (b path) is also significant ($b=0.319, p<0.01$). Thus, POS fully mediates the relationship between transactional leadership and work engagement. The Sobel test calculation showed that transactional leadership on work engagement's indirect effect is statistically significant ($z=3.117, p=0.008$).

By the results in Table 4, the direct effect of transformational leadership on work engagement (ϵ path) is not significant ($b=-0.372, p=0.440$). Conversely, the direct effect of transformational leadership on POS (a path) is significant ($b=1.293, p<0.01$). In addition, the relationship between POS and work engagement (b path) is also significant ($b=0.319, p<0.01$). Thus, POS fully mediates the relationship between transformational leadership and work engagement. The Sobel test calculation similarly showed that the indirect effect of transformational leadership on work engagement is statistically significant ($z=3.521, p=0.000$).

Moreover, the results of Table 4 show that the direct effect of the TOS on work engagement (ϵ path) is significant ($b=2.051, p<0.05$). Additionally, the direct effect of TOS on POS (a path) is significant ($b=3.045, p<0.01$). The relationship between POS and work engagement (b path) is also significant ($b=0.319, p<0.01$). Therefore, POS partially mediates the relationship between the three outcome scales and work engagement. The Sobel test calculation similarly showed that the direct effect of TOS on work engagement is statistically significant ($z=3.791, p=0.000$).

4. Discussion

By considering the aim of this study that explores the mediation role of POS between leadership styles and work engagement, the study's findings showed that age, gender, marital status, work experience, and residence were not significant differences in work engagement. On the contrary, the findings revealed a significant difference between work position groups and work engagement. The work positions showed meaningful differences in work engagement, and nurses with different roles at healthcare organizations illustrated an extra level of work engagement. Between socio-healthcare and hospital care positions found significant differences, while the rest of the positions (teaching & research - primary & community care) did not show significant differences. Additionally, those nurses who worked in the socio-healthcare position showed a high level of work engagement than in other positions. In comparing the findings with earlier studies, Tshilongamulenzhe and Takawira (2015) explained no significant differences between gender and work engagement. Additionally, Ntsoane (2017) reported that gender and age do not have any significant relation or difference with work engagement. In addition, Sharma et al. (2017) stated no difference in work engagement regarding gender and marital status, while they explained a significant difference between work engagement and age. Jaworek (2018) found a significant difference between work position groups and work engagement; those employees who worked as sales representatives, welfare services/rehabilitation, and teachers were more engaged in their work with telesales operators and blue-collar workers. Similarly, Hakanen et al. (2019) explained that a work position has a meaningful relationship with work engagement. Employees in human service occupations reported higher work engagement levels than those in other industries in 30 European countries. Considering the study results and previous findings, the work position among nurses assumed importance and effect on their engagement in this study.

Research results illustrated that transformational leadership, transactional leadership, and TOS were positively related to work engagement. On the contrary, laissez-faire was negatively associated with nurses' work engagement. Also, POS was positive with work engagement. Besides, transformational leadership, transactional leadership, and the TOS showed positive relations with POS. On the other hand, laissez-faire showed a negative association with POS. By considering the study results and comparing them with previous studies, Muthia Roza and Yuki (2016) reported that transformational leadership and POS have a significant and positive association. Similarly, Kim (2017) explained that transformational leadership style and POS are two critical factors impacting differential attitudes toward diversity. Gaudet and Tremblay (2017) likewise determined that leadership style is one of the main factors influencing POS. Moreover, Yildirim and Naktiyok (2017) also reported that transformational leadership and POS positively impact the employee. In their study, Qi et al. (2019) evaluated POS as a mediator between inclusive leadership and innovative employee behaviour in their research. Based on Imran and Aldaas (2020), POS and leadership substantially impact the organization's

outcomes; these are assumed as two primary organizational motivators for employees at the workplace. Also, the researcher's findings support previous investigations by Corin and Bjork (2016) that explained that organizational support is generally assumed as the managerial assignment that needs to be analysed to improve administrative work and sustainability.

The study results likewise showed that leadership styles, TOS, and POS enhanced work engagement prediction; TOS was a significant predictor of nurses' work engagement. Additionally, this study demonstrated the mediation model of the relationship between leadership styles, TOS, and work engagement; POS significantly mediated the associations between leadership styles, TOS, with nurses' work engagement at healthcare organizations. Moreover, among them, the only variable that directly affected work engagement was leadership behaviour outcomes. The earlier studies showed that Wang et al. (2016) described the POS influence on hospitals' work engagement levels. Similarly, Yongxing et al. (2017) evaluated POS's role in the association between job performance and work engagement as a moderator and reported POS and work engagement to have a positive association. Similarly, there is a positive relationship between POS and work engagement. Gillet et al. (2017) clarified that POS and work engagement positively contribute to employees' motivation. Additionally, Yasin Ghadi et al. (2013) reported that transformational leadership contributes to employees' attitudes and encouragement and increases employee engagement. In parallel, Hayati et al. (2014) clarified this result and emphasized the critical role of transformational leadership on employees' behaviours. Correspondingly, Dimitrov (2015) stressed that leadership influences employees' work engagement in the workplace. Gözükarar and Simsek (2015) also described that transformational leadership considerably improves work engagement. Schmitt et al. (2016) reported that transformational leadership positively impacts work engagement; in reality, this factor increases employee performance and positive attitudes. Manning (2016) examined the relationship between leadership styles and engagement amongst nurses and reported transactional and transformational leadership styles positively impacting nurses' engagement. According to these findings and the importance of situations for applying leadership styles, the Situational Leadership Theory proposed by Hersey and Blanchard during the mid-1970s referred to organizational behaviour management. It explained that there is no single "best" style of leadership. The investigators believed that effective leadership is task-relevant. Most successful leaders adapt their leadership style to the individual or group's performance or group they are endeavouring to lead or impact (Hersey & Blanchard, 1977). Additionally, by considering the results, TOS predicted nurses' work engagement at healthcare organizations in Catalonia, Spain. The study by Fant (2019) evaluated the role of transactional leadership and transformational leadership on work engagement and determined the role of these two styles as the best predictors. Furthermore, Dabke and Patole (2014); and Peng (2018) focused on the role of POS as a predictor of work engagement. Furthermore, Giray and Şahin (2014), almost similarly, reported that POS mediated the association between leadership styles (paternalistic, participative, and authoritarian leadership) and organizational variables.

5. Implications and limitations

Studying work engagement by linking it to leadership styles, TOS, and POS is relevant to the context of healthcare organizations across the globe. The results indicate that acting on organizational variables such as the supervisors' guidelines, organization strategies, and policies is necessary to improve nurses' performance. Additionally, some specific implications include: (1) Realizing and attention to nurses' needs for satisfying them in the health system by managers to improve work engagement; (2) Obtaining initial and necessary training about leadership styles and organizational behaviour; (3) Encouraging managers to support the nurses and consider their requirements by the health system; (4) It is essential to prepare updates and practical seminars and workshops for managers, supervisors, leaders, and nurses to become more familiar with organizational behaviour, and conflict management

There are some limitations to the present research. First, this study used a cross-sectional design and one time data collection. We recommend a longitude study for future researchers. Second, this study only focused on healthcare organizations in Catalonia, while it is necessary to cover bigger location such as whole Spain. Third, the Research evaluated private and public healthcare organizations together simultaneously, so it is suggested that future studies compare nurses in two different groups of public and private sectors. Fourth, this research is focused on

nurses and their perception of their supervisors (leaders); it would be convenient to do the same research with the supervisors' participation. The last, in this study, only 85 nurses participated, which assumed small compared to the total number of nurses in Catalunya; it would be convenient for future studies to have more participants.

6. Conclusion

According to the relationship between POS, leadership styles and work engagement among nurses, we can express that nurses have a higher demand and temporary pressure, which health systems should support and consider. Likewise, based on the critical role of nurses in health systems development, success, and the accomplishment of good population health outcomes, working of nurses in primary health care positions is valuable and internationally needs aid from leaders or managers. The results of the research demonstrate that those nurses who worked in socio-healthcare positions are more engaged compared to teaching and research, primary and community care, and hospital care positions. In the case of relationships between leadership styles, TOS, POS, and work engagement, transformational and transactional leadership styles have a considerable role in the high levels of work engagement. At the same time, laissez-faire cannot be assumed as a convenient style for nurses to increase their engagement in work. TOS, i.e., follower satisfaction, extra effort, and effectiveness, play a positive and influential role in nurses' work engagement. Additionally, based on the results, transformational and transactional leadership styles increase POS's effectiveness at work; and laissez-faire is conducted to a low level of POS. Based on positive relationship results of POS and work engagement, it can conclude that POS as one of the main organizational factors needs to be considered by managers or any persons in charge and the health organizations to provide a dynamic and productive environment for nurses according to their requirements, position level, and characteristics. These attentions can lead to a high level of satisfaction and well-being among nurses; also motivate them to be more engaged in their job and work environment. Finally, by considering the aim of this study POS plays essential role on nurses' engagement, also applying accurate styles of leadership increase the level of nurses' engagement.

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Author contribution

AM, JFC, and MPGGGO: performed all the research by developing the research theory and had completed the research methodology and data analyzing. They were involved in drafting the article. RGS: supervised the research data collection and had conducted the sampling of the study. JFC: supervised the whole of the research and had approved the final version of the manuscript. AM: completed all the manuscript and was correspondence with the article.

Conflict of interest

The authors have reported no conflicts of interest.

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ORIGINAL RESEARCH

Patient Safety Competency and its Related Aspects in Professional Education among Nursing Students of Two Nursing Schools in Iran: A Comparative Study



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Abstract

Background: The importance of patient safety competency in nursing students to enter the clinical environment has made continuous studies necessary. However, only few studies have been conducted to assess and compare patient safety competency and its related aspects among nursing students in various settings.

Purpose: This study aimed to compare patient safety competency and its related aspects among undergraduate nursing students of two nursing schools.

Methods: This descriptive comparative study was conducted at two nursing schools (A and B) in Iran. Using a census method, 240 undergraduate nursing students were enrolled from group A and 200 ones from group B. In total, 377 students completed the survey (response rate = 76.60 %). Data were collected using the adapted Health Professional Education in Patient Safety Survey (H-PEPSS). Data were analyzed using SPSS (version 21) and running descriptive statistics and independent samples t- test. The significance level was set at $p < 0.05$.

Results: Results showed that nursing students' means (SD) of patient safety competency in classroom (3.43(0.60)) and clinical setting (3.32(0.62)) were significantly higher in Group A compared with Group B (2.66(0.90) and 2.39(0.9), respectively). The means of the broader aspects of patient safety and comfortable speaking up about patient safety were significantly lower in Group A than Group B (3.58(0.71) and 3.31(0.59)) versus (3.79(0.71) and 3.55(0.72)).

Conclusion: Nursing students from two different nursing schools had varied levels of patient safety competency in the classroom and clinical settings. In addition, it was found that the participants had different perspectives on aspects of patient safety and perceptions of speaking up about patient safety ($p < 0.05$).

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1. Introduction

Changes in science and technology along with modern conceptions of professionalism suggest quality improvement and patient safety in healthcare settings as the professional responsibilities of all medical practitioners, notably nurses and nursing students (Karami et al., 2017). Patient safety is defined as the prevention of harm to patients and has long been a topic of discussion around the world (Lee et al., 2016). According to a growing body of evidence, improving patient safety competency and reforming health professionals' curriculum are happening slowly in the health professions (Torkaman et al., 2022).

Nurses, due to their unique position, can ensure successful implementation of patient safety strategies because they spend a majority of their time with patients. To improve healthcare

system, patient safety competency expertise is required to be enhanced (Sherwood & Zomorodi, 2014). Nursing education aims to provide nursing students with sufficient competencies to guarantee patient safety and quality of care in future (Tella et al., 2014). Students' competencies should be upgraded before graduation (Pudpong et al., 2017). Improving patient safety competency through education and training has been validated for over a decade by studies done in this field. Incorporating patient safety education into undergraduate nursing curriculum and assessing patient safety competency properly are the initial steps toward enhancing patient safety in clinical settings (Torkaman et al., 2022).

In 2006, the Canadian Patient Safety Institute (CPSI) initiated the Safety Competencies Project with the aim of optimizing patient safety by enhancing health professional education in this area. The conceptual underpinning of these competencies is composed of six socio-cultural domains: contributing to a culture of patient safety, working in teams, communicating effectively, managing safety risks, optimizing human and environmental factors, and recognizing, responding to, and disclosing adverse events (VanDenKerkhof et al., 2017).

Efforts to include patient safety competency in a healthcare professional education have increased. It is important to obtain trainees and new health professionals' perspectives of their own patient safety competency. Nursing educators play a critical role in the formation and development of nursing students' competencies. The collaboration of nursing educators in both academic and clinical settings is crucially important to make sure of the effectiveness of patient safety trainings in different environments (Bijani et al., 2019; Torkaman et al., 2022). Moreover, by assessing students' self-perceived patient safety competency in different educational environments, they can help adjust curricula to students' needs (Pudpong et al., 2017).

The literature review showed that few studies investigated nursing students' competency in two different contexts, while many studies done in a single educational system (Alquwez et al., 2019; Ginsburg et al., 2013). Ginsburg et al. (2013) assessed patient safety competency of newly registered nurses, pharmacists, and physicians in Canada. Their participants stated that effective communication with patients and other health care providers made them feel more confident in the dimension of patient safety learning. They also believed that learning about patient safety in the clinical settings gave them more confidence than learning it in the classroom. Alquwez et al. (2019) evaluated patient safety competency in undergraduate nursing students at several Saudi universities and revealed that nursing students had good attitudes toward patient safety competency. They also found that nursing students' patient safety competency differed significantly in terms of universities, gender, and year of study. These findings supported international accreditation organizations' claims on that patient safety competency should be evaluated in all clinical healthcare settings. Two studies in Canadian universities showed that junior and senior students had lower levels of confidence regarding patient safety competency than freshmen and sophomores (Duhn et al., 2012; Lukewich et al., 2015). Another study also revealed that patient safety educational interventions were not explicit and students scared of reporting adverse events. They suggested the need for more explicit patient safety education in the classroom and clinical settings (VanDenKerkhof et al., 2017).

However, to the best of our knowledge, only one study assessed nursing students' perception of patient safety competency and patient safety education-related aspects in Iran by using Health Professional Education in Patient Safety Survey (H-PEPSS) (Torkaman et al., 2022). Furthermore, assessment of students' self-perceived competency can help identify the conditions and gaps in integration of patient safety trainings into nursing education programs as well as in adjusting curricula to the students' needs on patient safety competency and aspects related to patient safety education. Moreover, assessment of patient safety competency in nursing students and discovering their views on patient safety-related aspects, such as broader patient safety issues in health professional education and comfortable speaking up about patient safety in vocational training, are essential to establish patient safety compliance. Therefore, the present study was conducted to compare patient safety competency between nursing students of two universities of medical sciences, assess students' perspectives on broader patient safety issues in health professional education, and understand their perceptions of comfortable speaking up about patient safety.

2. Methods

2.1 Research design

The present study employed a cross-sectional descriptive-analytical study to compare patient safety competency and its related aspects among undergraduate nursing students.

2.2 Setting and samples

This study was carried out in two nursing schools, one is affiliated to the University of Medical Sciences in the Southeastern (Group A) and the other is affiliated to the University of Medical Sciences in the center of Iran (Group B). Group A represents a new university that is located near the northwest and center of Iran and next to the political capital of Iran, Tehran, and this has caused many volunteers to study there. Meanwhile, Group B represents a university with a long history (about half a century) in the southeast of Iran. Therefore, the main question of researchers in this study is whether there is a difference in patient safety competency among nursing students in two universities that are different in terms of geography and age.

The target population included all undergraduate nursing students studying in the second, third and fourth year in two aforementioned nursing schools. Inclusion criteria included nursing students who successfully had passed the “Fundamentals of Nursing Course”, had started learning in clinical settings, and not employed in a hospital. Therefore, students in the first year were not considered as the target population. The exclusion criteria included those failing to complete the questionnaires. Given that the sample size was equal to the target population, all eligible nursing students were included in the study by a census method. According to the inclusion criteria, 240 undergraduate nursing students were enrolled from group A and 200 ones from group B. Among 240 eligible nursing students in group A, 40 questionnaires were not completed, which resulted in a response rate of 83.33%. Out of 200 eligible nursing students in group B, 63 questionnaires were not completed due to the participants’ lack of cooperation, which resulted in a response rate of 68.50%. As a result, a total of 337 undergraduate nursing students participated in the study. The overall response rate was 76.60%.

2.3 Measurement and data collection

The study questionnaires included a demographic questionnaire and the Health Professional Education in Patient Safety Survey (H-PEPSS) (Ginsburg et al., 2012). The demographic questionnaire comprised of questions on the students’ age, gender, attendance at patient safety training, observation of medical and nursing errors in clinical practices, and experiences of reporting errors to clinical educators, hospital staff, and peer students.

The H-PEPSS (with 38 items) was developed to assess patient safety competency in the socio-cultural dimensions of patient safety and its related aspects such as broader patient safety issues in health professional education and comfortable speaking up about patient safety. The H-PEPSS consists of three parts. The first part, which investigates “learning about specific patient safety content areas” (27 items), contains seven domains, namely, (1) issues related to clinical safety, for example safe medication, hand hygiene, infection control, and safe clinical practice in general (four items), (2) working in teams (six items), (3) communicating effectively (three items), (4) management of safety risks (three items), (5) optimizing human and environmental factors (three items), (6) recognizing, responding to, and disclosing adverse events and close calls (four items), and (7) contributing to a safety culture (four items). Considering the theoretical and practical nature of patient safety, items were designed for in two classroom and clinical training settings. The participants were required to answer the items individually according to what they had learned about patient safety in the classroom and clinical settings. Therefore, scores of the domains were calculated for the classroom and clinical settings separately. All 27 items of the first section were scored on the scale value of one (strongly disagree) to five (strongly agree), and the option of “don’t know”. Mean scores are calculated from the items in each dimension for each learning setting.

The second and third parts of the H-PEPSS investigate aspects related to patient safety in professional education, such as “how broader patient safety issues are examined in health education” (seven items) and “comfortable speaking up about patient safety” (four items), respectively. The second and third parts are scored based on the scale value of one (strongly disagree) to five (strongly agree). Higher scores indicate better positive perceptions about patient

safety competency, broader aspects of patient safety, and comfortable speaking up about patient safety.

The original H-PEPSS had confirmed internal consistency (Cronbach's $\alpha=0.81-0.85$) (Ginsburg et al., 2012; Ginsburg et al., 2013). In a study in Iran, the H-PEPSS was used with the developers' permission. The cross-cultural adaptation and translation of the H-PEPSS involved forward translation of the original H-PEPSS into Persian. Later, a proficient English translator conducted the backward translation of the Persian version into English. Next, the translated version was matched with the original version. Face validity of the instrument was also examined and confirmed by nursing students' perception and understanding of the items. The Persian version of the H-PEPSS received content validity confirmation from 10 nursing faculty members. The Content Validity Index (CVI) of the questionnaire and items was 90%. In addition, its reliability was corroborated using Cronbach's alpha coefficients of 0.72-0.83 and 0.78-0.85 for the class and clinical settings, respectively (Torkaman et al., 2022).

The data in this study were collected from September to October 2020. In order to collect data, two WhatsApp groups were created and the participants were added to each related group. Later, participants were provided with the required instructions to complete the questionnaires as well as the links of the study questionnaires via e-mail and WhatsApp groups. The questionnaires were sent back to the researchers automatically.

2.4 Data analysis

The data were analyzed by using version 21 of Statistical Package for the Social Science (SPSS, Inc., Chicago, IL). Descriptive statistics were expressed as mean and standard deviation for continuous variables and as frequencies and percentages for categorical variables. The independent samples t-test was applied to compare nursing students' H-PEPSS scores in two groups as well as investigate the difference of H-PEPSS scores with respect to demographic characteristics. The significance level was set at $p<0.05$.

2.5 Ethical considerations

This research with No. 98000996 was approved by the Ethics Committee of Kerman University of Medical Sciences (IR.KMU.REC.1399.030). In addition, the necessary permissions were presented to the Nursing and Midwifery Schools. The participants were explained about the study purpose, study process, and voluntary participation in the study. They were also assured that they could withdraw from the study at any time without any negative consequences and about the confidentiality of information they would provide.

3. Results

3.1 Demographic characteristics of the respondents

Based on the results of this study, in group A, about 59.3% of the participants ($n=121$) were female, and 90% ($n=180$) were younger than 25 years old. About 70.9% ($n=144$) of the participants had no attendance at patient safety training; 92.2% ($n=188$) had observed medical and nursing errors in clinical practices; 80.9% ($n=165$) had reported errors to clinical educators; 57.4% ($n=117$) had not reported errors to hospital staff; and 81.9% ($n=167$) had reported errors to peer students.

In group B, 51.4% of the participants ($n=75$) were female; 89% ($n=130$) were younger than 25 years old; 59.3% ($n=83$) had no attendance at patient safety training; 60.3% ($n=88$) had observed medical and nursing errors in clinical practices; 55.5% ($n=81$) had reported errors to clinical educators; 60.3% ($n=88$) had not reported errors to hospital staff; and 70.3% ($n=79$) had reported errors to peer students (Table 1).

Table 1. Demographic information of nursing students in two groups ($n=337$)

Variables	Categories	Group A		Group B	
		f	%	f	%
Gender	Male	83	40.7	71	48.6
	Female	121	59.3	75	51.4
Age groups	<25	180	90	130	89
	≥25	20	10	16	11

Table 1. Continued

Variables	Categories	Group A		Group B	
		f	%	f	%
Attendance at patient safety training	Yes	59	29.1	57	40.7
	No	144	70.9	83	59.3
Observation of medical and nursing errors	Yes	188	92.2	88	60.3
	No	16	7.8	58	39.7
Reporting errors to clinical educators	Yes	165	80.9	81	55.5
	No	39	19.1	65	44.5
Reporting errors to hospital staff	Yes	87	42.6	58	39.7
	No	117	57.4	88	60.3
Reporting errors to peer students	Yes	167	81.9	79	70.3
	No	37	18.1	67	29.7

3.2 Comparison of H-PEPSS domains and self-reported PS competency in different learning settings

Table 2 shows results on comparison of two groups regarding H-PEPSS domains and patient safety competency. Results showed that nursing students' total scores of patient safety competency in classroom (3.43(0.60)) and clinical setting (3.32(0.62)) were statistically significant higher in group A compared with total scores of patient safety competency in classroom (2.66(0.90)) and clinical setting (2.39(0.9)) in group B ($p=0.001$).

Table 2. Comparison of nursing students' H-PEPSS domain scores in classroom and clinical settings in two groups (n=337)

Patient safety domains	Settings	Group A	Group B	t-test	p-value*
		Mean(SD)	Mean(SD)		
Issues related to clinical safety	Class	3.89(0.81)	2.71(1.28)	10.55	0.001
	Clinical	3.83(1.18)	2.38(1.5)	10.06	0.001
Working in teams	Class	3.26(0.84)	2.56(1.11)	6.49	0.001
	Clinical	3.28(0.81)	2.34(1.29)	8.32	0.001
Effective communication	Class	3.61(0.95)	2.75(1.15)	7.55	0.001
	Clinical	3.60(0.87)	2.54(1.56)	8.08	0.001
Management of safety risks	Class	3.37(0.94)	2.67(1.19)	6.13	0.001
	Clinical	3.38(0.86)	2.41(1.30)	8.31	0.001
Optimizing human and environmental factors	Class	3.31(0.99)	2.51(1.05)	7.22	0.001
	Clinical	3.21(0.95)	2.36(1.33)	6.95	0.001
Recognizing, responding to and disclosing adverse events and close calls	Class	3.27(0.83)	2.66(1.43)	5.01	0.001
	Clinical	3.22(0.85)	2.31(1.27)	7.93	0.001
Contribute to a safety culture	Class	3.45(0.86)	2.72(1.15)	6.76	0.001
	Clinical	3.22(0.95)	2.35(1.29)	7.24	0.001
Total of patient safety competency	Class	3.43(0.6)	2.66(0.9)	9.11	0.001
	Clinical	3.32(0.62)	2.39(1.12)	9.97	0.001

Note. *p-values are significant at level of ≤ 0.05

3.3 Broader aspects of patient safety and comfortable speaking up about patient safety in both learning settings

Table 3 shows results on comparison of two groups in terms of nursing students' perceptions of broader aspects of patient safety and comfortable speaking up about patient safety. The results showed that the means of the broader aspects of patient safety (3.58(0.71)) and comfortable speaking up about patient safety (3.31(0.59)) were significantly lower in group A compared with group B (3.79(0.71) and 3.55(0.72), respectively), ($p=0.008$, $p=0.001$, respectively).

Table 3. Comparison of nursing students' perceptions of broader aspects of patient safety and comfortable speaking up about patient safety (n=337)

Variables	Group A	Group B	t-test	p-value*
	Mean(SD)	Mean(SD)		
Broader aspects of patient safety	3.58(0.71)	3.79(0.71)	-2.67	0.008
Comfortable speaking up about patient safety	3.31(0.59)	3.55(0.72)	-3.43	0.001

Note. *p-values are significant at level of ≤ 0.05

3.4 Comparison of patient safety competency, broader aspects of patient safety and comfortable speaking up about patient safety with respect to demographic data

Table 4 shows the scores of H-PEPSS domains in different learning settings, perceptions of broader aspects of patient safety, and comfortable speaking up about patient safety with respect to nursing students' demographic information. The scores of patient safety competency of nursing students who attended patient safety training ($p=0.001$) and reported errors to educators ($p=0.001$) and peer students ($p=0.04$) were significantly higher in the classroom setting. In addition, it was revealed that the scores of patient safety competency of nursing students who observed medical and nursing errors ($p=0.005$) and reported errors to clinical educators ($p=0.007$) and peer students ($p=0.001$), were significantly higher in the clinical settings.

Moreover, the score of broader aspects of patient safety was significantly higher in female students ($p=0.03$) who did not observe medical and nursing errors ($p=0.006$). Moreover, the score of comfortable speaking up about patient safety was significantly higher in students who did not observe medical and nursing errors ($p=0.03$) and did not report errors to clinical educators ($p=0.004$) based on the results of this study.

Table 4. Comparison of patient safety competency, broader aspects of patient safety and comfortable speaking up about patient safety with respect to demographic information of nursing students (n=337)

Variables	Categories	Patient safety competency in classroom setting	Patient safety competency in clinical setting	Broader aspects of patient safety	Comfortable speaking up about patient safety
		Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)
Gender	Female	3.06(0.82)	2.98(0.98)	3.74(0.65)	3.43(0.63)
	Male	3.14(0.82)	2.90(0.97)	3.58(0.78)	3.39(0.70)
	t-test	0.52	-0.45	-0.69	0.69
Age groups	p-value	0.34	0.46	0.03*	0.53
	<25	3.10(0.82)	2.92(0.99)	3.66(0.71)	3.42(0.66)
	≥ 25	3.02(0.88)	3.00(0.96)	3.75(0.77)	3.34(0.72)
	t-test	0.95	0.73	-2.12	-0.62
Attendance at patient safety training	p-value	0.60	0.65	0.49	0.45
	Yes	3.22(0.81)	2.85(0.8)	3.65(0.66)	3.46(0.67)
	No	2.89(0.78)	2.99(1.06)	3.68(0.75)	3.38(0.65)
	t-test	-3.55	-1.30	-3.87	1.01
Observation of medical and nursing errors	p-value	0.001*	0.19	0.70	0.31
	Yes	3.11(0.77)	3.01(0.81)	3.61(0.73)	3.37(0.66)
	No	3.05(0.98)	2.65(1.42)	3.88(0.65)	3.57(0.66)
	t-test	0.55	2.83	-2.78	-2.24
Reporting errors to clinical educators	p-value	0.58	0.005*	0.006*	0.03*
	Yes	3.20(0.76)	2.72(1.06)	3.66(0.77)	3.35(0.64)
	No	2.84(0.90)	2.03(0.93)	3.69(0.59)	3.57(0.69)
	t-test	3.83	2.71	-0.27	-2.93
	p-value	0.001*	0.007*	0.78	0.004*

Table 4. Continued

Variables	Categories	Patient safety competency in classroom setting	Patient safety competency in clinical setting	Broader aspects of patient safety	Comfortable speaking up about patient safety
		Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)
Reporting errors to hospital staff	Yes	3.15(0.81)	2.93(1.09)	3.73(0.69)	3.35(0.63)
	No	3.05(0.83)	2.94(0.89)	3.63(0.73)	3.46(0.68)
	t-test	1.11	-0.05	1.21	-1.51
	p-value	0.27	0.96	0.23	0.13
Reporting errors to peer students	Yes	3.15(0.80)	3.08(0.80)	3.65(0.73)	3.39(0.63)
	No	2.95(0.85)	2.59(1.24)	3.72(0.69)	3.46(0.73)
	t-test	2.97	4.37	-0.82	-0.88
	p-value	0.04*	0.001*	0.41	0.38

Note. *p-values are significant at level of ≤ 0.05

4. Discussion

This study compared patient safety competency and patient safety-related aspects in professional education between Iranian undergraduate nursing students of two medical universities. The findings showed that the scores of patient safety competency (in the classroom and clinical settings) and its domains obtained by the nursing students of group A were significantly higher than those obtained by nursing students of Group B. Langari et al. (2017) also found that both Finnish and British nursing students had excellent overall patient safety competency scores; however, the overall patient safety competency score in British students was much higher than that of Finnish students. Similarly, two other studies reported considerable disparities in patient safety competencies among students from several Saudi universities (Alquwez et al., 2019; Colet et al., 2015). According to Shanty et al.'s (2018) study findings, patient safety competency scores significantly differed between the study groups. Patient safety competency was reported to be higher in postgraduate nursing and nuclear medicine students. Patient safety competency of nursing students was higher in the classroom than in the clinical setting according to findings of a study done by Amilia and Nurmalia (2020). In a nutshell, it seems that the level of patient safety competency is different among university students. This difference can be attributed to cultural and contextual varieties in patient safety education throughout the world (Langari et al., 2017). Günay and Kılınç (2018) reported that clinical learning is affected by different factors, including personal characteristics, clinical educators, academic educators, physical facilities, and environment.

Based on the findings, the scores of broader aspects of patient safety and perceptions of comfortable speaking up about patient safety in nursing students of group A were significantly lower than that of students in group B. No studies have been conducted in this regard yet. Therefore, a gap exists among the studies on how to address patient safety issues and perception of comfortable speaking up about patient safety. Since attitudes can influence behavior, assessing nursing students' attitudes towards patient safety is important (Robson et al., 2011). In this regard, researchers found that speaking of mistakes and filling out reporting forms were more effective in improving patient safety (Asem et al., 2019; Berman et al., 2018). Researchers also explained that the reasons that nurses and students speak less about patient safety issues may be fear of punishment, incorrect recognition of medical errors, lack of knowledge in the field, blame, and pressure from other colleagues (Asem et al., 2019; Robson et al., 2011; Safarpour et al., 2017). Usher et al. (2017) believed that nursing students must have the confidence to communicate with others to improve patient safety, especially to challenge unsafe practice, recognize, disclose, and respond to adverse events, including errors and malpractices, to reach significant improvements in patient safety and create a harmless environment for patients.

In total, our results showed that the scores of patient safety competency were statistically significantly higher in nursing students, who attended patient safety training, observed medical and nursing errors, and reported errors to clinical educators and peer students. Similarly, Torkaman et al. (2022) showed that educational intervention was somewhat effective in

improving the patient safety competency in the long run. Gaupp et al. (2016) in line with the present study, indicated that e-learning improved students' attitudes toward patient safety competency. Two other studies also emphasized the role of education in understanding students' patient safety competency and their inclusion in the students' curriculum (Nie et al., 2011; Tom, 2016). Based on these findings, it can be concluded that students, who participate in workshops and training classes, gain more experience in patient safety. Observing and reporting medical and nursing errors allow students to become familiar with harmful cases to the patient. Consequently, reporting these errors and sharing them with other students and instructors, in addition to sharing self-experiences and observations, increase patient safety and may reduce errors in the clinical setting.

According to our results, score of broader aspects of patient safety was significantly higher in female students who did not observe medical and nursing errors. Moreover, mean of comfortable speaking up about patient safety was significantly higher in students who did not observe medical and nursing errors and did not report errors to clinical educators. One of the reasons why females were more concerned about patient safety issues than males may be the way they communicate with patients. Usually, women are more involved in conversations with the patient and their colleagues (Colet et al., 2015), which makes them more aware of patient safety concerns and issues, including medical errors. In addition, the more the students talk to their professors and instructors about patient safety in clinical setting, the less their fear of reporting errors and mistakes.

5. Implications and limitations

The results of the study implicate the importance of the attention to patient safety education among nursing students, suggesting a fundamental reform in the way novice nurses are prepared both in the classroom and in the clinical setting. Nursing professors are recommended to put more emphasis on the patient safety competency and its related aspects in educational curriculum. Results of the present study can guide nursing professors and managers to develop appropriate strategies in promoting nursing students' patient safety competency. These strategies may include reviewing the educational needs as well as modifying and developing the educational curricula.

This study had some limitations. The first limitation was related to its cross-sectional nature and gathering data at a single time period. The second limitation was the use of questionnaire to assess the safety competency and its related aspects in professional education, which may have resulted in exaggerative scores and personal bias. Future longitudinal studies are suggested to be done to collect detailed information on changes of patient safety competency over the time, from the students' entrance to the universities until they begin their clinical work. Moreover, future studies can be performed using different methods of competency evaluation, such as 360-degree evaluation method or other new and scientific methods, to help determine the actual competency.

6. Conclusion

According to the findings of the present study, nursing students from two different nursing schools had varied levels of patient safety competency in the classroom and clinical setting. In addition, it was found that the participants had different perspectives on larger aspects of patient safety and perceptions of speaking up about patient safety. The current findings can help policymakers align patient safety instruction with international standards in all nursing schools. Nursing professors are suggested to adopt new methodologies, such as realistic scenarios and role-playing. Researchers are recommended to undertake interventional and longitudinal studies to find out the efficacy of these strategies at improving students' patient safety competency.

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Author contribution

JF, AM, and FRS conceptualized, designed and wrote the research proposal. IN, SKH, and ZTM collected, analyzed, and interpreted the data. JF provided supervisions, essential suggestions, and recommendations throughout the research process. JF, AM, IN, SKH, ZTM and

FRS contributed equally to writing and revising the manuscript and approved the final manuscript.

Conflict of interest

The authors declare no conflict of interest.

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ORIGINAL RESEARCH

The Challenges of Intensive Care Unit Nurses Caring for COVID-19 Patients in Indonesia: A Qualitative Study



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Abstract

Background: After one year of the pandemic, Indonesia experienced a crisis where the addition of COVID-19 cases increased significantly in several big cities; it made the healthcare system collapse, including the intensive care unit (ICU) service for COVID-19. ICU nurses, who are at the frontline of fighting against COVID-19 and defusing this crisis, are faced with various challenges in providing care for COVID-19 patients, and exploring such challenges are significant.

Purpose: This study aimed to explore the challenges experienced by Indonesian nurses who work in the ICU caring for COVID-19 patients.

Methods: A multi-centered-qualitative study with a descriptive phenomenological design was used. Twenty nurses working in the ICU of COVID-19 in eight COVID-19 referral hospitals in seven major cities in Indonesia were recruited using purposive sampling. Semi-structured individual video call interviews were conducted to collect the data from July-September 2021. Data were analyzed using Colaizzi's (1978) method.

Results: The nurses reported the challenges throughout caring for COVID-19 patients in ICU, which are described in four major themes: (a) working under pressure and moral distress, (b) choosing to do the best, (c) adaptation, learning, and research, and (e) survive physically and mentally healthy.

Conclusion: This study describes the challenges experienced by nurses working in ICUs during the COVID-19 crisis, such as working under pressure, facing dilemmas caring for patients, and trying to survive working in inadequate professional conditions. An in-depth understanding of these challenges in the current pandemic can help managers in the hospital to provide psychological support, adequate training for ICU nurses, and high-quality protocols for upcoming emergency scenarios, as well as maximizing resource management (human and material).

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1. Introduction

The COVID-19 epidemic is increasing rapidly worldwide, with 224 countries affected until 24 January 2022 (Worldometer, 2021). The World Health Organization officially declared that the prevalence of COVID-19 has reached a global pandemic phase. The cumulative number of confirmed cases reported globally is now over 350 million (World Health Organization, 2021). Indonesia is the 14th country with the most Coronavirus cases globally by 25 October 2021, with 4,240,019 cases confirmed, and the number of deaths was 143,205. Indonesia's total COVID-19 deaths are still in the 2nd highest rank in Asia (Worldometer, 2021).

In July 2021, Indonesia experienced a crisis where the addition of COVID-19 cases increased very significantly in several big cities. In one day, the addition of patient cases was up to 56,757 points, and the daily death rate was up to 2,069 people (Worldometer, 2021). However, over one year into the COVID-19 pandemic, cases continued to fluctuate. Although the Indonesian government has established several policies which are based on the four crucial components of surge capacity: staff, stuff, structure, and system, currently available medical staffs are insufficient to deal with potentially increasing demands as the pandemic highlighted the human resources challenges that the healthcare system has been struggling with. Surges in patients requiring hospitalization have led to depleted medical supplies. The existing healthcare infrastructure is still inadequate to deal with the rise of COVID-19 cases (Mahendradhata et al., 2021). The most crowded island of Java (56.1% of the country's population) has the highest caseload, with all six

provinces in the island making up around 66.1% of the national tally (Ministry of Health Republic of Indonesia, 2021).

In response to the growing number of COVID-19 cases and to prevent the healthcare system from collapsing, several reorganization interventions have been implemented quickly. The number of ICU beds has been increased, elective surgical procedures have been canceled, and new units have been established, while other units have been converted for COVID-19 patients. (Lipsitch et al., 2020; Mari et al., 2020). As a result, entire nurse groups have had to be relocated to new units (Bagnasco et al., 2020).

At the beginning of the pandemic, Indonesia only had 1,910 ICUs with 7,094 critical care beds, which translates to about 2.7 critical care beds per 100,000 population (Phua et al., 2020), significantly lower than neighboring countries such as Malaysia (3.4 per 100,000 population), Thailand (10.4 per 100,000 population), and Singapore (11.4 per 100,000 populations) (Phua et al., 2020). Lack of adequate facilities for treating COVID-19 cases, particularly negative pressure wards and ICU rooms, especially outside Java, has been reported (Yunus & Andarini, 2020). Therefore, a referral hospital for COVID-19 treatment opened a new sub-unit in the ICU specifically to treat COVID-19 patients. According to a report by the International Council of Nurses, during the first wave of the COVID-19 pandemic response, health care systems focused instead on increasing the capacity and potential of intensive care units (ICUs), which resulted in increased intensive care provider working hours and the use of various rotating-shift patterns (International Council of Nurses, 2020).

During this pandemic, the ICU room has become a room with strict isolation. Nurses are at the forefront of caring for infected patients. Therefore special skills are needed in caring for infected patients in critical condition (Eghbali et al., 2020). The care of critically ill patients due to COVID-19 infection is very complex. Many things must be considered, starting from the limited information regarding specific treatment and appropriate nursing interventions, which are still limited from experience (Guo et al., 2020). In addition, care for critically ill patients infected with COVID 19 requires special attention such as expertise, knowledge, skills, attitudes, and the availability of infrastructure, both equipment and medical staff from hospitals. The lack of medical facilities and staff creates confusion in providing care to patients. This is due to the unpredictable disease prognosis, social isolation, and high virus transmission rates, making it a significant challenge for all countries to provide quality care (Qiu et al., 2020).

Nurses in the ICU play a role in assessing patients, minimizing complications by closely monitoring patients, carrying out airway management, changing positions, conducting education, and collaborating in drug administration (Mehta et al., 2020). Nurses also assist in meeting daily needs such as providing fluids and nutrition, meeting the needs of elimination and personal hygiene, conducting patient assessments and screening, emergency actions, and collaborating with other health teams in the care of critically ill patients (Liu, Luo al., 2020). Nurses face serious risks that can even cause death in caring for COVID-19 patients. The high morbidity and demand for care in the ICU, while the medical team and the unbalanced ratio of nurses and patients, coupled with limited hospital capacity, increase nurses' stress levels (Schwartz et al., 2020).

Guidance for health workers to understand the family's position and provide care to patients by involving and based on family choices is also a challenge. Nurses are asked to understand the family stress caused by their loved ones diagnosed with COVID-19 and experiencing a critical phase. Nurses must be the solution between family anxiety and the risk of their exposure to COVID-19. Nurses meet family needs such as communication, provide ongoing information amidst visitation restrictions, and anticipate family suffering and grieving, so that all add to the list to do (Chen et al., 2021). Internationally, nurses are experiencing fear, anxiety, stress, physical exhaustion, and feeling powerless to handle patients' conditions (Lai et al., 2020; Schroeder et al., 2020; Sun et al., 2020).

ICU nurses are experiencing intense psychological and physical effects as a result of caring for patients diagnosed with COVID-19 in a challenging care environment (Gordon et al., 2021). Providing health care by intensive care nursing professionals, during the COVID-19 pandemic, has shown both strong and weak points in the health care system. Nursing care has been influenced by fear and isolation, making it hard to maintain the humanization of the health care (Fernández-Castillo et al., 2021). Although one year faces the pandemic, the situation is still unstable; new cases were increasing dramatically in several cities, which has an impact on the ICU nurses, who are at the frontline of fighting against COVID-19. They faced various challenges

throughout providing care for COVID-19 patients that have not been revealed. Exploring such challenges is significant. Therefore, this study aimed to explore the challenges experienced by Indonesian nurses who work in the ICU caring for COVID-19 patients.

2. Methods

2.1 Research design

In this study, a descriptive qualitative phenomenological approach (Colaizzi, 1978) was used to explore the challenges experienced by ICU nurses in taking care of patients with COVID-19 in Indonesia. Qualitative research can improve understanding of nurses' experiences of life, procedures, processes, and events as they are observed in the natural environment without intervention. To do so, one must immerse themselves in the real world, engage in personal interactions with nurses, and learn from their experiences (Creswell & Poth., 2016). This approach seeks to enter into a person's experience as a whole, describes the structure of his experience, and aims to capture the main themes and meanings of the person about his experience so that in-depth information is obtained about the phenomenon (Creswell & Poth 2016).

2.2 Setting and participants

A total of 20 nurses working in ICUs of COVID-19 in eight COVID-19 referral hospitals in seven major cities in Indonesia (Jakarta, Bandung, Padang, Kalimantan, Surabaya, Medan, and Jogjakarta) were recruited using purposive sampling. The inclusion criteria were the followings: (1) ICU nurses with at least one year of critical care experience, (2) having experience of caring for COVID-19 patients for at least one month, and (3) expressing willingness to participate in the study and share their experiences. Research permission was obtained from the hospital director where the researchers conducted the study. The hospital's nurse manager provided the researchers with information on the nurses' names who met the inclusion criteria. The first author asked for help from a nurse manager to search for potential participants by contacting them over WhatsApp and outlining the study's goals. The exclusion criteria included nurses who were in isolation due to COVID-19 infection.

2.3 Data collection

Data were collected using semi-structured face-to-face online interviews using zoom meetings by the first and second researchers. Interview guidelines were developed by the researchers and nursing experts in qualitative studies. The study was conducted from July to September 2021. Participants were asked to describe their experiences concerning the survey's central questions, such as "Please, describe your experience working in ICU during the pandemic caused by COVID-19" and "What were the challenges you experienced as an ICU nurse in caring for COVID-19 patients". The interviewer then went on to ask more probing questions like "What do you mean?", "Please clarify", and "Could you be more explicit?" to probe deeper into their more profound experiences.

All interviews were done following the principles of personal protection. The researcher made every effort to respect participants' privacy and provide them with the most significant level of comfort possible. The researcher taped all dialogues during the interviews with the consent of the participants. Each participant was interviewed once, and each interview lasted 30–60 minutes. Interviews continued until the data was exhausted. It is worth noting that data saturation was achieved with only 20 nurses.

2.4 Data analysis

As this was a descriptive phenomenological study, data were analyzed using Colaizzi's (1978) method. This rigorous and robust method ensures the credibility and reliability of the results obtained. It allows researchers to identify emergent themes and their relationships. Furthermore, this method is straightforward and logical and can reveal the structure of the experience under study (Colaizzi, 1978). Two researchers (FM & RM) independently reviewed and transcribed the audio recordings to text immediately after the complete interview. To gain a sense of participants' descriptions of the challenges of their experience taking care of patients with COVID-19 in ICU, the authors read the transcribed data in detail several times to obtain nurses' perceptions of the challenges in taking care of patients with COVID-19 in the ICU. The researchers (FM & RM) analyzed the transcript manually and coded significant words, statements, or phrases related to

the nursing experiences. A color-coded system was used to highlight substantial statements to perform the preliminary analysis. Then, the two authors organized the significant statements into meaningful units that clustered the categorizing codes into themes and integrated the obtained themes related to the nurse's experiences into an in-depth description of the challenges experienced phenomenon. After the themes were extracted, a discussion session with all authors was held to reach a consensus on the extracted themes. We analyzed the data simultaneously with the data collection. The themes were presented to five participants to ensure accuracy compared to their statements on their own experiences. The participants reported the findings to be true and that the conclusions represented an accurate reflection of their experiences.

2.5 Trustworthiness/rigor

Trustworthiness can be obtained by utilizing the criteria of credibility, transferability or fittingness, and consistency or dependability (Lincoln & Guba 1985). To determine the acceptability of the data gathered from participants, the interview findings were sent by email to all participants in the form of transcripts. Member checking was also done to validate the results, as it is the most critical technique to establish credibility and allow participants to reflect on experiences (Mays & Pope, 2020). The dependability of this study was maintained by involving an expert in qualitative research to audit and analyze a series of research processes. Confirmability was done by debriefing the study results with the research team to ensure no bias in analyzing and developing the themes. All researchers agreed with all findings. Finally, the researchers tested transferability by summarizing the study's findings and providing a narrative explanation of the interview results. It was done so that the readers could clearly understand the results of the research and could use and apply the results of the study elsewhere.

2.6 Ethical consideration

This study received approval from the Health Research Ethics Committee of Dr. M. Djamil Hospital, Padang, Indonesia, with a reference number of 219/KEPK/2021. The researchers introduced themselves to the participants, discussed the study's goals and procedures, received signed informed consent, and assured them that their personal information would be kept private.

3. Results

3.1 Profile of participants

Data saturation was reached after interviewing 20 participants. Most of them were 26-45 years old (95%), female (60%), married (80%), and had bachelor's degree (55%), 1-3 years experience in ICU (60%), and >6 months work in ICU for COVID-19 (60%). The characteristics of participants are listed in Table 1.

Table 1. Demographic characteristics of the study participants

Characteristics	f	%
Age (years)		
26-45	19	95
46-60	1	5
Gender		
Male	8	40
Female	12	60
Education		
Diploma's degree	6	30
Bachelor's degree	11	55
Master's degree	3	15
Marital Status		
Married	16	80
Single	4	20
Intensive care experience		
1-3 years	12	60
>3 years	8	40

The data analysis identified four main themes: (a) working under pressure and moral distress, (b) choosing to do the best, (c) adaptation, learning, and research, and (e) survive physically and mentally healthy. The themes and sub-themes are presented in Table 2.

Tabel 2. Themes, subthemes, and codes obtained from data analysis

Coding	Sub-theme	Theme
Stress gained from pandemic Worry about transmitting the disease to family Fear of getting infected COVID 19 Grieving/sad to see the patient's condition Stress every day caring for the corpse Separated from family Stress caring for the family of officials/leaders Anxiety Caring for colleagues Many ICU nurses have been confirmed positive for COVID	Psychological suffering	Working under pressure and moral distress
We are feeling burnout at work. The nurse-patient ratio is not ideal. Full bed every day Can not refuse patients/ disaster situation slackening "time off"/ vacation time Difficulty adjusting prone position	Physical exhaustion	
Overheated when wearing personal protective equipment Dyspnoea Inability to use the bathroom when wearing personal protective clothes/ hazmat Reduced ability when working with personal protective gear Skin allergies when wearing personal protective clothes Difficulty eating/drinking when wearing personal protective gear	Exhausting using Personal Protective Equipment	
Unpredictable condition fighting for overcomes the difficulty in breathing New variant COVID-19 There is no progress in the cure rate/the death rate increases. Bad prognosis Patients have Happy hypoxia.	Unclear prognosis of diseases	
The family does not accept the patient's condition. Family doesn't believe in COVID 19 The family is not willing to hold the corpse of the COVID 19 protocol. Receiving threats from the patients' family	Uncooperative patients family	
Sense of caring increases Although not recommended, still perform CPR to save the patient's life. Reduce CPR Suction as needed Bed-making is not every day. Lowering the quality of action to achieve quantity Unable to accompany a patient who dies	Humanity Choose priority interventions and reduce routine activities.	Choose to do the best
Take a shower after leaving the room. Longer working hours Red/green zone work area division Division of working hours in shifts Preparation of all drugs in the green zone Optimizing communication using telephone/video calls Observation via cctv/ nurse call	Changes in work patterns/work routines	Adaptation, learning, and research
Co-workers have no experience in intensive care. Train new nurses/volunteers Increasing number of patients in the ICU Increasing number nurses infected COVID-19	Increase workload	

Tabel 2. Continued

Coding	Sub-theme	Theme
Learn new treatment and nursing care for COVID-19 patients (ECMO, CRRT, Prone position) Learn new knowledge about the treatment and care of COVID-19 patients	Learn/Upgrade knowledge about COVID 19	
Evaluating some of the interventions carried out in overcoming shortness of breath Engaged in several medical/health research	Research	
Maintain physical condition Eat healthy food and vitamins. Routine SWAB Pray for health	Nurse preventive efforts Pray	Survive physically and mentally healthy

3.2 Theme 1: Working under pressure and moral distress

All the participants reported they were working under pressure and in moral distress. The nurses who work in ICU for COVID 19 stated that they were tired and feeling burnout. This theme consists of five sub-themes, namely psychological suffering, physical exhaustion, exhausting using personal protective equipment, unclear prognosis of diseases, uncooperative patient's family.

3.2.1 Psychological suffering

According to data analysis, stress gained of a pandemic, worry of transmitting the disease to family, fear of getting infected COVID 19, grieving/sad to see the patient's condition, stress every day is caring for the corpse, separated from family, stress caring for the family of officials/leaders, anxiety caring for colleagues, and many ICU nurses have been confirmed positive for COVID 19 indicated psychological suffering.

Most participants reported stress, sad, and tired; for example, participants said, *I'm worried that if I get infected, and later it will also pass on to my family at home; therefore I choose to live apart for a while. (P5); I feel stressed and tired; I think about when I work without wearing a hazmat; I'm tired, physically and mentally stressed. I talk to friends, and they also feel what I feel. (P16).* Likewise, (P7) reported: *The saddest thing is when I take care of my colleagues, I worry if something terrible will happen. I want to give the best care so that they get well., I worry if something terrible will happen. I want to give the best care so that they get well. (P7)*

3.2.2 Physical exhaustion

Participants stated that they were feeling burnout at work. The nurse-patient ratio is not ideal. In addition, nurses also stated that they were physically exhausted due to the state of the ICU bed being full every day, unable to refuse patients/disaster situations, reduced rest/vacation time, and difficulty adjusting to the prone position.

Most of participants explained: *At the pandemic's peak, the challenge is that the nurse-to-patient ratio is not ideal, but this is a disaster; we can't refuse patients, so we accept patients regardless of the patient's condition, I feel exhausted. (P18).* Most participants reported that almost every day the bed in ICU is full, especially from Mei to July: *Beds are always full; new patients come and die right away. It's crowded. (P6).* Another participant also reported: *When many ICU nurses are also infected, the workload is increasing, we can't even ask for off on duty. (P9)* Some nurses reported that difficulties to adjusting prone position: *Most of us who work in the ICU is a woman, so when we want to adjust the prone position, it is difficult for us, coupled with the many devices attached to the patient's body, it is tiring. (P12)*

3.2.3 Exhausting using personal protective equipment

Data analysis showed that most participants feel overheated when wearing protective clothes (hazmat suit), dyspnoea, inability to use the bathroom when wearing personal, protective clothes/hazmat suit, reduced ability when working with personal protective gear, skin allergies when wearing personal protective clothes, difficulty eating/drinking when wearing personal protective gear.

The following are some of the statements stated by the participants: *The difference in routine has happened; we are in the red zone, we can't take our hazmat off for 8 hours, so we can't eat, we can't drink, we can't pee, we endure all that. (P4)* Another participant also reported: *At first, my skin was itchy because of allergies to material from protective clothes; maybe it happened because of the extreme heat, I was itchy, and my skin was red. (P15)*

In addition, some nurses also complained about limited mobility when using self-protection equipment: *It will be more difficult to use full personal protective equipment (PPE) to act. I feel like our movements are limited. Sometimes when I use goggles (medical glasses), I sweat, so it becomes dewy. (P16)*

3.2.4 Unclear prognosis of diseases

The participants said that the prognosis of the disease was unclear and looked different for each patient. This is a challenge for nurses in providing nursing care. The participants stated that unclear prognosis of COVID-19 due to unpredictable patients' conditions, nurses have to fight to overcome the difficulty of breathing, the appearance of new variant COVID-19, and there is no progress in the cure rate/the death rate increases.

Participant 13 stated: *The patient's condition is unpredictable; they look fine, but when I check, the saturation is 80%; this is called Happy hypoxia. (P13)*. Some nurses said that COVID-19 patients who have been put on ventilators have very little chance of recovery; this is a big question for them. One of the participant stated: *I am confused; there is a big question regarding patients infected with COVID 19 attached to ventilators. Most of them do not survive, and the recovery rate of patients on ventilators is very low. (P17)*. Currently, many new variants of COVID-19 have emerged, making nurses confused. A nurse said:

COVID-19 is a new disease for us, and now new variants are also emerging, so we are faced with something that we do not know for sure what the treatment will be; this makes us curious about the prognosis of patients with this disease is unclear and unpredictable, This condition is rarely encountered in a regular ICU. (P18)

3.2.5 Uncooperative patients family

One of the challenges faced by nurses in the COVID-19 ICU is providing understanding to the patient's family regarding the nursing care provided. Some of the patients' families do not believe in the COVID-19 virus and are not cooperative during the nursing process. Some nurses stated that the family does not accept the patient's condition; the family does not believe in COVID 19. The family is not willing to hold the corpse of the COVID-19 protocol, receiving threats from the patients' family. P1 reported the following:

Many people have not received that his family was diagnosed with COVID- 19. The patient's family sometimes made a problem in the hospital; there was a family of patients asking to take care patient at home, and there were even families of patients who tried to bring the bodies of patients with Covid 19 because they were not willing if their families were buried with COVID-19 Protocol. (P1)

Another participant also stated: *Another challenge is from a family of patients who reject their families being knocked out with Covid 19 protocols; hospitals must call the police to help secure the condition. (P18)*

3.3 Theme 2: Choose to do the best

This theme consists of two sub-themes: humanity and choosing priority interventions and reducing routine activities.

3.3.1 Humanity

In a crowded situation where the nurse-patient ratio is not ideal, the nurses said they were still trying to do the best for the patient. For example, since the pandemic, performing CPR in ICU for COVID-19 was not recommended, even though, nurses still perform CPR to save the patient's life due to a sense of caring. A participant said: *Although COVID-19 patients in the ICU should*

not be given CPR based on guidelines, we continue to carry out CPR because of a sense of humanity. (P16)

3.3.2 Choose priority interventions and reduce routine activities

When the ICU room for COVID-19 is full every day and many ICU nurses are infected with the disease, nurses must sort out priority interventions that must be given to patients, such as reducing CPR, performing suction as needed, lowering the quality of intervention to achieve quantity, and being unable to accompany a patient who dies.

A participant stated: *I did suction as needed because this action is at risk of the spread of COVID-19 via airborne, so we have to be vigilant. (P16)*. Another participant also stated:

In situations where the Covid 19 case peaked, we must know when we should provide service to the maximum level and when we provide optimal services; we discuss it like this, if we prioritize the quality of service with that number of patients, it doesn't seem possible. We must reduce service standards, finally the action that does not affect the treatment and care of the patient, the frequency we subtract, for example, we do not make the bed every day. (P18)

3.4 Theme 3: Adaptation, learning and research

This theme consists of four sub-themes: changes in work patterns/work routines, increase workload, learn/upgrade knowledge about COVID 19 and doing research.

3.4.1 Changes in work patterns/work routines

For efficiency in ICU, the nurse management made a policy to change the pattern of working hours and divide working hours into shifts and nurse's work areas into red and green zones. Nurses shower after leaving the room, divide working hours into shifts, prepare all drugs in the green zone, change communication patterns, increase workload, and learn/upgrade knowledge about COVID-19. All nurses said their work patterns changed and were modified according to management policy, as indicated by the following participant's statement:

In the COVID-19 ICU work pattern, we modified in one shift and were divided into two teams. The first team initially entered the room four hours; after the first team came out, the second team entered. The difficulty was when the patient was a lot. At the same time, the nurse worked in (red zone) a little because it was divided into two, so it is pressed, especially if the patient's condition is unstable. (P1)

In ICU for COVID-19, we maximize communication using telephone and video calls. We do handover in the morning, we read all the follow-up plans and checks that have been done, inside (red zone) we also handover again, if we don't understand or miss about planning for today we can confirm via telephone. (P4)

3.4.2 Increase workload

The participants reported that the workload increased in line with significantly rising number of COVID-19 cases in Indonesia. Increased work in the ICU is caused by COVID-19 patients who require intensive care, such as respiratory failure, kidney failure, decreased consciousness, and other complications. The increasing number of ICU nurses infected with the COVID-19 has added to the nurse's workload in the room. The increase in the number of nurses in the ICU who are fresh graduate nurses and do not have experience does not help much work in the ICU. Some participants reported:

The situation is very congested; the workload has increased due to many waiting lists for patients in the ICU; besides that, many nurses in the room must self-isolate because they are infected with COVID-19 and cannot work. (P17)

Nurses who work in the ICU have diverse experience backgrounds; most of the volunteers are fresh graduates and do not have work experience, so it becomes a challenge to guide and teach them, sometimes I feel it adds to the burden just my job. (P19)

3.4.3 Learning/upgrade knowledge about COVID-19

Besides the negative effects of the pandemic, all participants also reported increased knowledge and skill during taking care of COVID-19 patients in ICU. The participants stated:

During this pandemic, I learned a lot of new things related to the treatment of COVID-19 patients, staff arrangements in the ICU, and managed the equipment in the intensive unit. In addition, I also have to motivate the nurses in the ICU to always be enthusiastic about fighting this virus. (P2)

Another participant (P11) also stated: *I have to learn continuously as the development of COVID-19 treatment continues to grow; this is a new challenge for me. As a nurse, my knowledge and skills have also increased (P11)*. Similarly, P3 expressed: *I had the opportunity to study and do ECMO (Extra Corporeal Membrane Oxygenator), CRRT (Continue replacement renal therapy) it was very challenging (P3)*.

3.4.4 Research

Some participants said that caring for patients with COVID-19 is like conducting research. Everyday, nurses evaluate some interventions to reduce the symptoms, for example, nurses tried to evaluate some interventions to overcome shortness of breath and engaged in some medical/health research. A participant stated:

I'm excited, since the COVID-19 ICU was opened, our knowledge has increased, our skills have improved, so it's like research because covid 19 is new, so we are like research every day with the patient's condition, how do patients respond to an intervention? Can we do this intervention? If the patient's situation is different, we try other interventions, so it's like research because there is no clear and definite procedure for handling the condition of covid 19 patients. Nurses and doctors cooperate in providing interventions. (P1)

3.5 Theme 4: Survive physically and mentally healthy

This theme reveals participants' challenges to survive physically and mentally healthy against the pandemic. Participants who work in ICU for COVID-19 stated that they have preventive efforts and pray.

3.5.1 Nurse preventive efforts

Data analysis showed that one of the crucial needs of nurses in taking care of COVID-19 patients was paying attention to their nutritional needs. Nurses revealed that they try to maintain health by consuming healthy foods, vitamins, and regular swab test. One participant stated:

The challenge now is how do we keep our physical condition healthy; we have to work with protective wear, it's hard, we have to keep our immune strong, especially with full patients every day, we have a lot of work, we can't sit in the room, that's the real challenge. Beside that, our challenge is to see the patient's condition, sometimes we take care of our co-workers, it becomes stressful too, it feels like just waiting for our turn. (P16)

3.5.2 Pray

Nurses always prayed that the pandemic will end soon and the situation will return to normal. A participant stated: *I pray that the pandemic will pass quickly, and we can normally work again. (P14)*. Nurses hope the society to obey with health protocol to prevent the transmission of COVID-19, as stated by P8: *I hope that the public obeys the health protocol because when I see the patient's condition in the ICU, which is very concerning, it feels very sad; I always pray that the pandemic will pass soon. (P8)*

4. Discussion

The present study examined the challenges faced by ICU nurses in caring for COVID-19 patients in Indonesia. Four themes were extracted as challenging things, including: "work under pressure and moral distress", "choose to do the best", "adaptation, learning and research", and "survive physically and mentally healthy".

4.1 *Working under pressure and moral distress*

The challenges of ICU nurses in COVID-19 wards included working under pressure and moral distress. Nurses feel they are responsible for providing care to COVID-19 patients, but that does not mean it is going without a hitch. The stress is caused by the unknown nature of the disease, fear of being infected, and the possibility of infecting others (Liu, Yang et al., 2020). Although nurses are tired and exhausted due to wearing protective suit for long periods of time, feel discomfort and helplessness due to the heavy workload during the shifts (Sun et al., 2020), nurses showed preserved intention to work during the COVID-19 outbreak (Mailani et al., 2021).

One of the sub-theme of working under pressure and moral distress is psychological suffering, which is also in line with a study by Karimi et al (2020) that nurses experience mental anxiety, stress, and fear. Their emotions feel suffering, their work becomes turmoil, and they survive lack of support. The emergence of this pandemic in many countries exposes nurses to new experiences and challenges such as inadequate resources, inadequate PPE, increasing number of patients, and lack of preparedness (overcoming pandemics). Conditions like this cause nurses' physical and mental strain and complex ethical problems (Chen et al., 2020; Zhang et al., 2020). In the fight against COVID-19, nurses are working valiantly to give care and save lives. In this study, participants also expressed challenges in providing care for unclear known diseases, providing nursing care to patients such as exhausting protective cover, changing work patterns, excessive workload, and working with new co-workers and new teams. Many of them work long shifts for weeks without taking a day off. ICU nurses also have to deal with the insecurity of their jobs. The uncertain nature of the sickness, the unpredictability of the disease prognosis, and the lack of a precise treatment induce stress. This situation puts them in danger of contracting COVID-19, leading to death (Catton, 2020).

This study showed that nurses work under pressure and have moral distress, such as physical exhaustion and psychological suffering. Previous research by Hu et al. (2020) reported that nurses experienced emotional tiredness (60.5 %), depersonalization (42.3 %), and 91.2 % of nurses experienced anxiety, despair, and moderate to high fear levels. The fear faced by nurses was due to the case of a nurse colleague who died from being infected with COVID-19, thus causing anxiety of disease infection for nurses who cared for COVID-19 patients. Numerous studies have demonstrated epidemic disease outbreaks put a psychological strain on nurses. Nurses caring for COVID-19 patients in the ICU are under a lot of stress, which puts them in danger of developing psychological problems like fear, worry, restlessness, depression, confusion, anxiety, nervous moods, and aggression (Moradi et al., 2021; Park & Park 2020). Without the added stress of a worldwide pandemic, the ICU is already a high-stress workplace. Caring for COVID-19 patients can turn acute stress into chronic stress, resulting in persistent anxiety and depression in these nurses (Gordon et al. 2021).

4.2 *Choose to do the best*

This study shows that caring for a COVID-19 patient was challenging for nurses; they fight against an uncertain situation, but they make an effort to keep joining to help a critical patient. Another pressure was how they worked and grew as decision-makers. Face problems like acute patients, maintain the care standart, demand empathy, care for patients' families long-distance, deal with painful emotions, humanity, and priority. These give nurses strategies to adopt in decision-making (Paixão et al., 2020). It involves emotional intelligence from nurses (James & Bennet, 2020). So, they can have a mechanism to maintain the care standart and care commitment during the COVID-19 (Woodson, 2021).

In a crowded situation when COVID-19 cases are increasing in several big cities in Indonesia, almost every day, there are full patients in the ICU for COVID-19. This causes an increase in the workload of nurses. Nurses face a dilemma and various confusing conditions in making decisions to provide care to patients, such as dealing with COVID-19 patients who have a cardiac arrest. Even though it is not recommended to perform CPR on COVID 19 patients in the ICU, nurses continue to take these actions for the sake of humanity. One of the challenges nurses face in providing nursing care is that the ratio of nurses to patients is not ideal, and nurses must think critically to take the best action to save patients' lives. The previous study also showed that nurses reported challenges providing human comforting connections, experiencing patient deaths, isolation, PPE concerns, care delays, changing clinical practice guidelines, and language barriers (Gordon et al. 2021).

During the pandemic emergency, nurses went through an extraordinarily delicate and complex period; their technical expertise and relational abilities, which are often associated with the care relationship, were put to the test. Providing thorough care during the pandemic's most severe phases was difficult. Other actions are prioritized due to many patients and their crucial and complex situations (such as the constant monitoring of vital parameters, the administration of therapy, and the management of machines and devices). As a result, there is little room for primary care (for mobilization, renewal of medications, help in feeding or personal care, and others) (Moretti et al., 2021).

The nurses' remarks about the care context revealed turbulence and a lack of support and equipment. To offer the correct care for COVID-19 patients, the care context encompasses a variety of components such as supportive equipment, personal protective equipment, facilities, and appropriate regulations and environmental conditions. The health care center's contextual flaws, according to nurses, are a substantial obstacle to giving quality care (Karimi et al. 2020). Furthermore, current stress, complicated patient care, confusing disease state, and system inefficiencies can all impact the quality of care provided by nurses (Hamers et al., 2016).

4.3 Adaptation, learning, and research

Another challenge in providing healthcare by ICU nurses during the COVID-19 pandemic is adaptation. Nurses' adaptation is a feedback mechanism that explains how dynamic systems evolve in planned and unplanned ways (Holden et al., 2013). Providing care for isolating patients, using hazmat suit, increasing workload, changing teams, changing the priority of action, and changing pandemic conditions are demanded from health institutions. This experience shows both strong and weak points in the health care system (Fernández-Castillo et al., 2021). Our study found that nurses experience physical fatigue due to changes in work patterns. Other research conducted by Galehdar et al. (2021) indicated that as the number of patients increased during the COVID-19 outbreak, nurses' working hours climbed by 1.5-2 times from what they had previously. Workload grows with increased working hours (Sun et al., 2020). The use of personal protective equipment that nurses wear for safety appears to have contributed to this overwhelming fatigue. Another study found that wearing protective equipment for extended periods makes nurses weary (Sun et al., 2020). Nurses must bear heavy and warm clothing until the end of their shift.

The participants in the study expressed their experience that the leadership made a policy to divide working hours into one shift, divided nurses into two teams, and took turns caring for patients in the red zone. Hence, the working hours of nurses using personal protective equipment are shorter. By implementing this program, nurses can refresh their break time by eating, drinking, going to the bathroom, and even taking a shower. The increasing number of COVID-19 cases requires nursing programs to be managed so that nurses can work optimally. Cadge et al. (2021) stated that one of the challenges of working with new co-workers and teams, such as building relationships on new care teams, had to be negotiated; nurses struggled with a lack of defined roles. Challenges arose from being paired with different nurse partners each day while also working with the unfamiliar staff is one of the challenges of the ICU nurses during COVID-19. According to Danielis et al. (2021), being recruited and transferred to the COVID-19 ICU is a double-face professional experience for nurses. The mix of negative feelings in the early stage can affect the preparation of nurses and the performance of nurses personally, in teams, and professions.

4.4 Survive physically and mentally healthy

The next challenge is to stay physically and mentally healthy. The spread of COVID-19 can reach professional health workers and nurses as the vanguard in facing challenges in changing physical and emotional conditions. The participants in this study tried not to be exposed to COVID-19 to increase immunity and control psychological disorders. Leng et al. (2021) suggest providing adequate training related to maintaining health and avoiding COVID-19, providing appropriate care for nurses during working hours, and the availability of psychological support. The participants also explained that these challenges include the condition of spirituality. Being sincere, fulfilling responsibilities, and not giving up are the keys to carrying out tasks; besides, participants always pray to God to start work and ask for care. According to Shahmari et al. (2020), nurses showed the spirit of self-sacrifice and did not give up on providing the best care.

Nurses also grieve because of their patients' suffering; they are competing for demands for attention from patients, families, health workers team, and their own families. Nurses endure longer working hours, higher schedules, and the intensity of a work environment where the failure of care and multiple deaths are the daily fare. These can increase stress levels (Jordan et al., 2016). According to the American Association of Colleges of Nursing (AACN) (2020), nurses need support for their health and resilience if they continue to work in stressful circumstances. Nursing is not only about care delivery to other people, but nurses must be aware that it is essential to take care of oneself first.

Nurses demonstrated a spirit of self-sacrifice and persisted in giving patients the finest care possible (Shahmari et al., 2020). Nurses' ability to provide care and professional commitment are related to nurses' spiritual health (Chiang et al., 2016). High spiritual well-being has reduced emotional fatigue (Rushton et al., 2015). Our participants also explained that these challenges include the condition of spirituality. Being sincere, fulfilling responsibilities, and not giving up are the keys to carrying out tasks; participants always pray to God to start work and ask for care. Praying is one practice to achieve psychophysical balance and wellness (Nilsson, 2022).

5. Implications and limitations

This study provides insight into the challenges of ICU nurses against COVID-19 in Indonesia. The findings of this study provide several implications for nurses and hospital management. First, hospitals must always provide equipment and preparations to support protection to make nurses confident in protecting themselves before giving nursing care to COVID-19 patients. Second, maintaining optimal human resource management functions by facilitating nurses to update knowledge related to the care of COVID-19 patients. Third, nurse management must create a good environment and provide support to increase nurses' morale in dealing with work pressure. And lastly, hospitals must also carry out health-related supervisory roles such as periodic swabs and monitoring of nurses' physical and psychological conditions to prevent the effects of workload.

The authors acknowledge that this study has limitations. What we are aware of in this study is the limitation of sampling. Participants in this study came from various hospitals in Indonesia with different bed capacities; this situation can lead to different challenging experiences for nurses. Participants in this study had previous work experiences in the ICU, with the duration of work varied, affecting the experience and skills of participants in caring for patients. In addition, this was a short-term study, and prolonged engagement with the subjects can provide a valuable way to identify the present and future challenges.

6. Conclusion

This study describes the challenges experienced by ICU nurses during the COVID-19 crisis, such as working under pressure, facing dilemmas caring for patients, and trying to survive working in inadequate professional conditions. An in-depth understanding of these challenges in the current pandemic can help managers in the hospital to provide psychological support, adequate training for ICU nurses, and high-quality protocols for upcoming emergency scenarios, as well as maximizing resource management (human and material). Nurses expect to be able to help patients; they work harder to give COVID-19 care to patients. Still, the pandemic conditions put physical and psychological pressure on them, so they are expected to be supported in their workplace. We suggest nurses recognize when they feel burnout and focus on fulfilling their life balance, nurses must know if they need health care providers to solve physical problems. Organizations need to make an effort to strengthen the structure of a workforce that will support each nurse in their professional nursing role. Given the difficulties nurses encounter in responding to pandemics, the findings can be used to construct and develop health care systems in Indonesia. The development of evidence-based systems results in the support and protection of the nurses, who make up the most valuable workforce in the healthcare system. That support immediately enhances patient care and safety.

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Author contribution

FM, EH: study design.

FM, EH: data collection.

FM, RM, BFK: data analysis.

FM, EH, BFK, EO: drafting and revision of the manuscript.

Conflict of interest

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

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CASE STUDY

Application of Breathing Exercises Using Ida Jean Orlando's Dynamic Nurse-Patient Relationship Model in Overcoming Postoperative Hypoxia (POH) after Coronary Artery Bypass Grafting: A Case-Series



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Abstract

Background: Postoperative hypoxia (POH) is a complication that often occurs in patients after Coronary Artery Bypass Grafting (CABG). Breathing exercises are considered effective in overcoming POH after CABG. However, this intervention has not been implemented using the dynamic nurse-patient relationship model from Ida Jean Orlando. The dynamic nurse-patient relationship model is expected to improve the quality of nursing care after cardiac surgery.

Purpose: This study aimed to describe the application of breathing exercises in postoperative hypoxia after CABG using the dynamic nurse-patient relationship model.

Methods: This study was the summary of the case presentation along with the interventions on three patients after CABG through the dynamic nurse-patient relationship model approach with the main intervention focusing on breathing exercises.

Results: After three days of implementing the intervention, most patients showed improvement in POH. This condition was evidenced by an increase in the PaO₂/FiO₂ ratio from less than 200 to above 200, with an average increase of 89.3. The blood gas analysis results supported the results from a respiratory alkalosis condition to a normal PH and a PaCO₂ value from <35 mmHg to the normal range (35-45 mmHg). Also, X-rays of the patients showed pulmonary atelectasis improvement.

Conclusion: Applying breathing exercises in postoperative hypoxia after CABG using the dynamic nurse-patient relationship model can improve POH in post-cardiac surgery patients. We recommend using the model theory approach because this theory can see patients' psychological and physical changes dynamically in post-CABG patients.

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1. Introduction

Coronary artery bypass grafting (CABG) is a method of cardiac surgery and invasive coronary reperfusion interventions in coronary heart disease (American Heart Association, 2018; PERKI, 2015; Thielmann et al., 2017). Patients undergoing cardiovascular surgery using general anesthesia, mechanical ventilation machines, and cardio-respiratory bypass machines have a high potential for postoperative pulmonary complications (Wynne & Botti, 2004). Postoperative pulmonary complications include impaired gas exchange function, atelectasis, decreased ability to cough effectively, pneumonia, respiratory muscle weakness, and sputum retention (Badenes et al., 2015; Ranucci et al., 2014; Sutton et al., 2014; Yousefshahi et al., 2019).

The prevalence of pulmonary complications after thoracic surgery, including CABG such as atelectasis, pleural effusion, and phrenic nerve paralysis, is estimated at 2-4% (Shakuri et al., 2015). As a result of pulmonary complications, patients generally experience postoperative

hypoxia (POH) (30%), and about 2% have acute respiratory distress syndrome (Ranucci et al., 2014; Wynne & Botti, 2004). This condition can increase the length of stay in the intensive care unit (ICU), and use prolonged mechanical ventilation, thereby increasing hospital costs (Badenes et al., 2015).

In recent years, to speed up postoperative recovery, the Early Recovery After Surgery (ERAS) program (Kołodziej et al., 2019), was developed to improve treatment outcomes (Nicholson et al., 2014). The ERAS guidelines are integrated into perioperative care, which refers to a series of evidence-based perioperative care processes to achieve rapid recovery (Li et al., 2018). In the postoperative phase, breathing exercises become the standard of postoperative care in post-cardiac surgery patients (Noss et al., 2018). No previous studies have implemented a breathing exercise intervention using the dynamic nurse-patient relationship model from Ida Jean Orlando. However, this theory is considered to produce quality nursing care.

Nurses have an essential role in the physical, psychological, social, and spiritual conditions in the peri-operative care of heart surgery. Currently, specialist nurses have been widely introduced as specialist nursing care providers to provide more quality and specific nursing services (Lopatina et al., 2017). Based on this, the dynamic nurse-patient relationship model concept is a primary theory in providing nursing care to post-cardiac surgery patients. This theory uses the basic principles of critical thinking, a client-centered and goal-oriented approach, and evidence-based nursing intervention recommendations (Butler, 2019). Social information processing models enhance understanding of how nurses respond to patients and further develop nursing theories. In combination, the theories help develop research into nurse-patient communication (Sheldon & Ellington, 2008). The nursing intervention and the dynamic nurse-patient relationship model will produce quality nursing care.

In post-CABG patients, communication becomes an essential component carried out by nurses and patients (Hardin & Kaplow, 2019). Also, in performing interventions, one of which is breathing exercises, one must use good communication. This is necessary so patients can follow the nurse's instructions properly and produce optimal outcomes. Orlando's theory of the dynamic nurse-patient relationship provides a theoretical framework for understanding that communication (Gaudet & Howett, 2018). This study aimed to describe the application of breathing exercises in postoperative hypoxia after CABG using the dynamic nurse-patient relationship model.

2. Case presentation

A case series with an observational research design approach was used in this study. The cases were three patients after CABG in the ICU of a single hospital in December 2019. The inclusion criteria in this study included the adult patients who experienced POH with $\text{PaO}_2/\text{FiO}_2 < 200$ and impaired gas exchange as a nursing diagnosis (code D.0003). In addition, the patients were conscious and followed orders. The exclusion criteria in this study were patients using mechanical ventilation. When post-CABG patients were admitted to the ICU, the researcher selected patients who met the inclusion and exclusion criteria of the study. After that, the researcher informed the patients of the study. When the patient agreed, the researcher explained the procedure and initiated the research intervention.

2.1 Case history before the intervention

The three male patients, aged 57, 56, and 56 years old, underwent respiratory monitoring intervention, and the supporting intervention is acid-base management. The specific history of each client is shown in Table 1.

2.2 Interventions

Each patient involved in this study gave voluntary written informed consent and consented to publication. The purpose of nursing interventions with nursing problems, in this case, referred to Indonesian nursing output standards, expected that gas exchange would increase with the criteria for improving blood gas analysis results. The primary interventions were respiratory monitoring and breathing exercise, while the supporting intervention was acid-base management. The breathing exercises were carried out using incentive spirometry four times a day, 15-20 minutes per session for three days of the intervention.

Table 1. Patient's health history

Name (Age)	Health history
Mr. (57)	<p>Admitted to the ICU Cardiac surgery with a diagnosis of three grafted post CABG and Aorta Valve Replacement (AVR). The patient had secondary diagnosis of obesity with BMI>30.4 and was a heavy smoker.</p> <p>The 3rd day of hospitalization after CABG and AVR surgery, the patient was put on a simple oxygen mask of 6 liters/minute. The patient was having a shortness of breath accompanied by an increase in Work of Breathing (WOB). There were fine crackles on the right and left lungs, Blood Pressure (BP) of 110/60 mmHg, Mean Arterial Pressure (MAP) of 70 mmHg, Heart Rate (HR) of 110 beats/minute, Respiratory Rate (RR) of 24 breaths/minute, and patient peripheral saturation of 90%.</p> <p>The patient was decided to undergo a chest X-ray, lung ultrasound, and blood laboratory examination. The X-ray examination results found left lung atelectasis, pneumonia, and pleural effusion. Lung ultrasound examination revealed right and left lung atelectasis. The results of blood laboratory examination blood gas analysis were: pH 7.47; PO₂ 74.5; PCO₂ 33.9; HCO₃ 29.7; actual BE 6.4; lactate 0.9; Hb 11.2 gr/dl; Ht 37.4%; leukocytes 22,000/ul; platelets 406x10³; urea/creatinine 32.50/1.28; Glomerulus filtrate rate (GFR) 58%; Current blood sugar 141; Sodium (Na) 140 mmol/L; Potassium (K) 3.7 mmol/L; Chloride (Cl) 105 mmol/L; Calcium (Ca) total 2.34 mmol/L; Magnesium (Mg) 1.8 mmol/L; diuresis 0.4 ml/kgBW/hour. PaO₂/FiO₂ was 191.</p>
Mr. (56)	<p>Admitted to the ICU Cardiac surgery with a diagnosis of three grafted post CABG and secondary diagnosis of obesity with BMI of 31.</p> <p>On the third day, the patient complained shortness of breath and increasingly ineffective breathing, so a simple oxygen mask of 8 liters/minutes was put on the patient. Physical examination found abnormal BP of 100/60 mmHg, MAP of 70 mmHg, HR of 100-110 beats/minute, RR of 25 breaths/minutes, and patient peripheral saturation of 92%.</p> <p>The patient underwent a chest X-ray and blood laboratory examination. Left lung atelectasis was found and blood gas analysis showed pH 7.49; PO₂ 95.3; PCO₂ 17.9; HCO₃ 13.8, and actual BE -6.6. Other laboratory results showed potassium 3.7; Na/CL 147/106; and Ca/Mg 0.78/0.35. PaO₂/FiO₂ was 200. To improve the respiratory status, the patient received simple mask oxygen therapy. The X-ray examination results found left lung atelectasis.</p>
Mr. (56)	<p>Admitted to ICU Cardiac surgery with four grafted post CABG diagnosis and a BMI of 26.4. The patient has had heart problems for five years.</p> <p>Three days after surgery, the patient complained of heavy breathing, cough, and difficulty in expelling phlegm. The patient had done deep breathing and coughing exercises, but not optimal (short breaths and ineffective cough). The physical examination showed abnormal BP of 124/86 mmHg, regular HR of 109 beats/minutes, RR of 24 breaths/minutes, oxygen saturation of 92% with nasal oxygen of 4 liters/minutes, CRT of <2 seconds, and an installation of substernal and intra-pericardium drain connected to the water shield drainage system, to assist the clearance of blood, serous fluid, and air for preventing post-operative complications. X-ray examination results found left lung atelectasis. Blood gas analysis showed pH 7.46, PaO₂ 145.2, PaCO₂ 38.2, HCO₃ 22.6, BE -1.1, potassium 3.8, Na/CL 145/105, Ca/Mg 0.88/0.40, and lactate 2.8 mmol. PaO₂/FiO₂ was 197.6.</p>

The intervention was carried out by identifying the patients according to the inclusion and exclusion criteria of the study. After obtaining consent from the patients, the patients were positioned in a semi-fowler's position by holding the respirometer upright. The researcher placed the mouthpiece in the patient's mouth and then instructed the patients to close the mouth around the mouthpiece tightly. The researcher then advised the patients to inhale slowly and deeply with the lips tightly closed on the mouthpiece. After the patients had inhaled as deeply as possible, they held their breaths for 3 seconds and then exhaled to lift the three balls according to the patient's ability. Finally, the patients were asked to remove the mouthpiece from the patient's mouth and exhaled normally. The procedure was repeated 10 to 15 times per session.

The application of breathing exercise was combined with the theory of Ida Jean Orlando. The communication process was prioritized, like conveying the steps of breathing exercises and paying attention to changes in the psychological condition that occurred in patients. Orlando's theory of

the dynamic nurse-patient relationship was to identify the strategies for teaching the patients to apply the effective nursing practice, including communication. The theory was expressed in simple language that broke down the communication between the nurse and the patient into two primary categories, automatic and deliberative action. When a deliberative action took place, the patient's immediate need was met after validation and discussion between the nurse and the patient. Meanwhile, automatic action was carried out without any discussions or inputs from the patients. A helpful, trusting relationship was established if the nurse used a deliberative approach and validated the patient's distress or unmet need. This process is described in Table 2. In applying breathing exercises to post-CABG patients, good communication should be used. This was necessary so patients could follow the nurse's instructions properly and produced optimal outcomes. Three cardiovascular specialist nurses and one ICU consultant physician were involved in this process.

Table 2. The dynamic nurse-patient relationship model of Ida Jean Orlando

Component	Actions
The function of professional nursing	Nurses find out and meet patient needs
The patient's presenting behavior	The nurse identifies the patient's verbal and nonverbal expressions.
The immediate reaction	Spontaneous response by the nurse covering three sequential aspects:
Automatic responder	Perceptions, Thoughts, Feelings
Perceptions Thoughts Feelings ↓ Nursing Action (Does not validate the patient)	
Deliberative responder	
Perceptions Thoughts Feelings ↓ Nursing Action (Validate patients using a deliberative process)	
Deliberative nursing process	
The nursing care process involves the patient by asking the patient to validate or invalidate what the nurse has done (Perceptions, Thoughts, Feelings) to determine nursing interventions further.	a. The nurse conveys the results of verbal and nonverbal observations directly to the patient b. The patient validates or invalidates the nurse's immediate reaction c. The nurse plans nursing interventions based on patient validation
Nursing Product	As a basis for evaluating the fulfillment of patient needs, the nurse notes whether or not there is improvement in the behavior changes that the patient shows.

2.3 Patient's conditions after the intervention

The description of the symptoms and patients' conditions after three days of interventions are presented in Table 3.

2.4 Evaluation

There was an improvement in lung function in the ventilation-perfusion process. It is noted that the body did not carry out a compensatory mechanism, as evidenced by a decrease in body pH from a respiratory alkalosis condition to a normal pH and a PaCO₂ value from <35 mmHg to

the normal range (35-45 mmHg). Based on Guyton's theory in the oxygen dissociation curve, oxygen will be difficult to bind to hemoglobin under alkalosis conditions. Therefore, the PaO₂ state will indicate hypoxemia.

Furthermore, after the 3rd day of the intervention, the PaO₂ value improved the alkalosis condition that caused hypoxemia. This condition was evidenced by an increase in the PaO₂/FiO₂ ratio from less than 200 to above 200, with an average increase of 89.3. In the first patient (57 years), PaO₂/FiO₂ increased from 191 to 269.7. In a second male patient aged 56 years, the PaO₂/FiO₂ rose from 200 to 288.5. Finally, similar to the previous two patients, the third male patient, who was also 56 years old, also experienced an increase in PaO₂/FiO₂ from 197.6 to 298.2. Also, the X-ray showed an improvement in the state of pulmonary atelectasis.

Table 3. Symptoms and patients' conditions after intervention

Name (Age)	Symptoms and patients' conditions
Mr. (57)	Complaints of reduced shortness of breath, respiratory rates 20 breaths/minutes, no WOB found, vesicular breath sounds on the right and left lung from the auscultation of the voiced breath, ABP 100/70 MAP 80, Heart Rate (HR) 98 beats/minutes, RR 18 breaths/minute, patient peripheral saturation 95%. The results of blood laboratory examination blood gas analysis: PH 7.45; PO ₂ 89; PCO ₂ 36.8; HCO ₃ 23.1; actual BE 2.4; lactate 0.9; Sodium (Na) 145 mmol/L; Potassium (K) 3.3 mmol/L; Chloride (Cl) 98 mmol/L; Calcium (Ca) total 2.34 mmol/L; Magnesium (Mg) 1.6 mmol/L; diuresis 0.6 ml/kgBW/hour. X-Ray examination revealed no pulmonary atelectasis. PaO ₂ /FiO ₂ was 269.7.
Mr. (56)	Complaints of reduced shortness of breath, ABP 100/60 MAP 70, Heart Rate (HR) 90 beats/minute, RR 20 breaths/minutes, patient peripheral saturation 96%. blood gas analysis (PH 7.44 PO ₂ 95.2 PCO ₂ 35.2 HCO ₃ 22.3 actual BE - 2.2, The X-ray examination results did not find left lung atelectasis. PaO ₂ /FiO ₂ was 288.5.
Mr. (56)	Complain of reduced shortness of breath, ABP 118/82 mmHg, HR 88 beats/minutes regular, oxygen saturation 96% , RR 18 breaths/minutes regular, CRT < 2 seconds, T, X-ray examination results not find left lung atelectasis. Blood gas analysis examination PH 7.42 PaO ₂ 98.4 PaCo ₂ 44.2 HCO ₃ 22.9 BE -2, 1, Potassium 3.1 Na/CL 143/103Ca/Mg 0.88/0.40, lactate 2.0 mmol. PaO ₂ /FiO ₂ was 298.2.

3. Discussion

This study used the dynamic nurse-patient relationship model to describe the application of breathing exercises in postoperative hypoxia after CABG. After three days of implementing the intervention, most patients showed improvement in POH. This condition was evidenced by an increase in the PaO₂/FiO₂ ratio from less than 200 to above 200, with an average increase of 89.3. The blood gas analysis results support the results from a respiratory alkalosis condition to a normal PH and a PaCO₂ value from <35 mmHg to the normal range (35-45 mmHg). Also, X-rays of the patients showed pulmonary atelectasis improvement.

Postoperative hypoxia is a condition that often occurs in after CABG patients which has the potential to increase morbidity and mortality (Stephens et al., 2013; Sutton et al., 2014); one study explained that POH occurs in 30% of cases post CABG (Ranucci et al., 2014). In the most severe cases, POH will increase the time to use mechanical ventilation to require insertion of a tracheostomy, increase the length of stay in the intensive care unit, and increase the cost of care (Ranucci et al., 2014). In addition, these conditions will result in a decrease in lung expansion capacity, an increase in the alveolar-arterial oxygen difference, and an increase in the intrapulmonary shunt fraction (Stephens et al., 2013; Sutton et al., 2014). All changes that occur due to POH can cause a decrease in the ratio between arterial oxygen pressure (PaO₂) and the fraction of inspired oxygen (FiO₂) (PaO₂/FiO₂) (Ranucci et al., 2014).

The patient described the POH condition, where there was a desaturation condition. The saturation value became <95%, and the arterial oxygen pressure value became <90 mmHg after CABG. Pathophysiologically, this condition can occur because a systemic inflammatory reaction

occurs after CABG so that it can cause alveolar dysfunction; the occurrence of leukocytosis in patients evidences this. In addition, there is the release of various pro-inflammatory cytokines such as TNF- α , IL-1, IL-2, IL-6, IL-8, and endotoxins during CABG, which can lead to neutrophil entrapment in the pulmonary capillaries. After that, there will be swelling of endothelial cells, plasma, extravasation of proteins into interstitial tissue, the release of proteolytic enzymes, congestion of alveoli with plasma, erythrocytes, and inflammation (Hussain & Harky, 2019).

Weight factors play a role in POH conditions in these patients. Research conducted by Ranucci et al., 2014 explains that obesity has a high risk of POH. Pathophysiologically, the work of breathing is significantly higher in obese than in lean patients. This primary mechanism that causes an increase in work of breathing is a decrease in functional residual capacity and an increase in respiratory resistance due to the reduction in lung expansion (Ranucci et al., 2014). Two patients in the case presentation showed obesity, so it was suspected that it could affect the condition of POH after CABG surgery. Although the patient has a history of smoking, it is explained that patients with a history of smoking will reduce vital lung capacity so that they are at high risk of experiencing POH after CABG (Guan et al., 2016). One of our patients is a heavy smoker.

Various respiratory modalities and respiratory physical therapy have been proposed to improve blood gas values, pulmonary function and prevent or treat pulmonary complications after CABG (Corley et al., 2011; El-Kader, 2018). We provided breathing exercise intervention to patients four times a day using incentive spirometry, 15-20 minutes each session for three days after CABG surgery. The results of a study show that incentive spirometry can improve blood gas values for patients in phase I of a cardiac rehabilitation program after CABG (El-Kader, 2018).

Incentive spirometry can encourage the patient's breath to reach total lung capacity and maintain maximum inflation that can open the alveoli to prevent atelectasis and overcome postoperative hypoxemia conditions to increase lung expansion after lung expansion major thoracic surgery (Yazdannik et al., 2016). Other literature explains that breathing exercises using incentive spirometry can increase the resistance in the respiratory muscles and consist of hyperventilating for an extended period so that it can have an additional effect on respiratory muscle endurance to be more efficient (Eltorai et al., 2018).

Communication is a major component in the success of the nursing process (Salifu et al., 2022). We used the Orlando's theoretical interpersonal approach to the case, assuming that, as cardiovascular nurses, we would be able to discover the hidden needs of the patient. This discovery will undoubtedly result in appropriate therapeutic nursing interventions for patients. In the Orlando model, nurses' behavior is required to observe, report, record, and act. Using this approach can help organize and classify the information needed by patients in the hospital (Abdoli & Safavi, 2010). When the nurse-patient relationship is dynamic, patients can better meet their needs. Effective nursing interactions and processes increase patient comfort and reduce stress on them. In this theory, the emphasis of nursing care on patients suffering from distress and care related to perceptions, thoughts, and feelings of pain and nursing is carried out through strategic steps (Abdoli & Safavi, 2010). No research has explained the effect of Orlando's theory on the approach to doing breathing exercises. Still, a study presents that patients undergoing endoscopy experience decreased anxiety levels with the Orlando nursing theory approach (Yekefallah et al., 2017).

In the theoretical concept of the dynamic nurse-patient relationship model, Orlando describes the dynamic relationship between nurses and patients (Butler, 2019; Rosenthal, 1996). To put the theory into practice, the nurse derives the patient's need for assistance based on observation and patient behaviors, including a need for help or improvement. Patients who are cognitively or physically impaired cannot express their needs. The nurse determines the need for support by observing the patient's behavior, such as restlessness or an adverse change in vital signs. Nursing interventions are carried out in stages, and we continue to apply the dynamic nurse-patient relationship at each intervention step (May, 2013). In this case, as cardiovascular specialist nurses, we provided nursing care following our disciplines. We explained to patients that we are not just an extension of the doctor's delegator, cardiovascular specialist nurses who carry out nursing care. Orlando is a "professional nursing authority" (Rosenthal, 1996).

4. Implication and limitation

We recommend breathing exercises in perioperative cardiac surgery patients to prevent pulmonary atelectasis and POH. In addition, we recommend using a dynamic nurse-patient relationship model approach in critical post-CABG patient situations in the intensive care unit because this theory can dynamically see the psychological and physical changes of patients.

The limitation of this research is that the sample is small and only uses a single center. So that a multicenter study is needed in order to be able to generalize the results of the investigation. In addition, no measurement of pulmonary function test was performed to assess overall respiratory status.

5. Conclusion

Combining the breathing exercises nursing intervention and a dynamic model of the nurse-patient relationship improved lung function and pulmonary atelectasis to solve the postoperative hypoxia (POH) in post-CABG patients. The intervention can enhance the quality of nursing care in post-cardiac surgery patients. We recommend using the model theory approach because this theory can see patients' psychological and physical changes dynamically in post-CABG patients.

6. Consent

The nursing committee of the hospital study site had approved this research. Moreover, the patients agreed to be involved in the study.

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The author would like to thank the patients for participating in this study.

Author contribution

All authors contributed to the final manuscript. In addition, IF, AG, EN designed the study, wrote, and revised the manuscript. HE and MK were involved in data collection.

Conflict of interest

The authors declared no conflict of interest.

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ORIGINAL RESEARCH

The Use of ICT in Providing HIV Services during the COVID-19 Pandemic: A Qualitative Study among Filipino HIV Volunteers



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Article Info	Abstract
<p>Article History: Received: 12 April 2022 Revised: 20 August 2022 Accepted: 22 August 2022 Online: 31 August 2022</p> <p>Keywords: Community health services; COVID-19; HIV infections; social media; technology; volunteers</p> <p>Corresponding Author: Jerome V. Cleofas, PhD, RN Department of Sociology and Behavioral Sciences, De La Salle University, Manila, Philippines Email: jerome.cleofas@dlsu.edu.ph</p>	<p>Background: The COVID-19 public health crisis has caused disruptions in the continuum of Human Immunodeficiency Virus (HIV) services. Hence, HIV advocates and care providers must innovate to ensure the health and welfare of people living with HIV (PLHIVs) and other at-risk populations. There is a lack of empirical research that explores the experiences and perspectives of HIV volunteers in adapting to pandemic-related challenges.</p> <p>Purpose: This qualitative study aimed to describe the use of information and communications technology (ICT) in the provision of HIV services of Filipino volunteers during the pandemic.</p> <p>Methods: Qualitative descriptive study design was used, focusing on ICT use for HIV care. Sixteen (16) purposively selected volunteers from three community-based organizations (CBO) were interviewed using a semi-structured guide via videoconference. Inductive qualitative content analysis was used to draw insights from the data.</p> <p>Results: Findings revealed that volunteers used various ICTs such as social media, videoconferencing, dating sites, and online-based courier services to ensure continuity of HIV services. However, volunteers noted challenges in using ICT for HIV services, such as limited access to digital resources, increased work demands, and lack of human connection.</p> <p>Conclusion: Various tools and implementations of ICTs have been used by volunteers to ensure the continuity of services of PLHIVs. This study provides insights to nurses and informaticists in implementing digital technologies in caring for vulnerable clients during outbreaks like COVID-19.</p>

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1. Introduction

The Philippines is one of the countries with the fastest growing Human Immunodeficiency Virus (HIV) epidemics worldwide, registering a 203% increase in new infections from 2010 to 2018 (Ganguanco, 2019). At the end of 2019, the Department of Health, the Philippines (2020) recorded 74,807 HIV cases and estimated that 35 Filipinos were tested positive for the virus daily. In 2020, the HIV registration rate was decreased by around 40% from 2019 due to the restrictions induced by the 2019 novel coronavirus (COVID-19) pandemic. However, in the 2021, the rate increased to 12,341, which is almost similar to the 2019 rate (Department of Health [DOH], the Philippines, Epidemiology Bureau, 2022).

HIV-focused community-based organizations (CBO) have been instrumental in augmenting national and local government efforts in providing health and social services for persons living with HIV (PLHIV). An essential human resource of CBOs is its group of volunteers (professional and non-professional HIV care and service providers), who aid in ensuring individuals have access to HIV-related services and advocate for the welfare of PLHIVs and other related at-risk groups. The landscape of HIV service delivery in the Philippines is shaped by the efforts and innovations of CBOs and their volunteers (Constantino et al., 2016; Cousins, 2018; Quilantang et al., 2020).

The COVID-19 pandemic presented unprecedented challenges in the delivery of HIV services. Evidence from a scoping review demonstrates pandemic-induced disruptions in services,

decreased access to pharmaceutical supplies, and disruptions in service coordination, face-to-face consultations, and other related services, which have caused poorer health wellbeing outcomes among PLHIVs (Winwood et al., 2021). In addition, the fear of exposure to coronavirus has constrained the care provided by HIV frontline workers (Operario et al., 2020) and impacted their overall wellbeing (Sagaon-Teyssier et al., 2020). Mathematical modeling (Jewell et al., 2020a; Silhol et al., 2021) and empirical evidence (Medina et al., 2021) suggest that prolonged COVID-19-induced interruptions in service provision can result in increased cases of opportunistic infections and HIV-related deaths (Jewell et al., 2020b). This is a concern for the Philippines, which placed 50th out of 53 countries in terms of COVID resilience in February 2022 (Chang et al., 2022). The country has yet to completely lift all quarantine and social distancing measures due to controversial public health strategies implemented by the government in addressing the pandemic (Hapal, 2021). In line with this, the DOH, the Philippines (2021) reported a 61% decrease in HIV testing in the Philippines during the first year of COVID-19.

During the early months of the pandemic, HIV scholars in the Philippines (Quilantang et al., 2020) and elsewhere (Beima-Sofie et al., 2020; Jewell et al., 2020a; Jewell et al., 2020b) have forwarded recommendations regarding innovations to ensure continuity of HIV service delivery. These include increasing the use of telemedicine for counseling and treatment, modifying distribution mechanisms for essential medicines, and advocacy activities for the continuity of social services. Case studies that feature these pandemic-responsive HIV programs demonstrate their promise for long-term use (Smith & Badowski, 2021; Qiao et al., 2020). However, there is limited evidence in the Philippines and ASEAN that investigates the actual experiences of the actors involved in these modifications and innovative strategies. On this topic, only one study in the Philippines has been published, demonstrating the effectiveness of an online-based HIV self-testing program among priority populations (Eustaquio et al., 2022).

Like other sectors in society, health and social services have relied on information and communication technologies (ICT) to ensure that the basic needs and services of the population are met during the pandemic (Mouratidis & Papagiannakis, 2021). COVID-19-related social restrictions necessitated the increased and innovative use of ICT in delivering HIV services (Beima-Sofie et al., 2020; Qiao et al., 2020; Quilantang et al., 2020). While substantial evidence demonstrates the effectiveness of ICT-based HIV services (Simoni et al., 2015; Smith & Badowski, 2021; Young & Chiu, 2014), most of these were conducted pre-pandemic.

Nursing informatics, which includes “...use of information technologies by nurses in relation to the care of their patients, the administration of health care facilities...” (Staggers & Thompson, 2002), is a practice in the Philippines that is being institutionalized at a rapid pace. The experience of CBO HIV volunteers, some of whom are nurses, can help further contextualize this field of nursing in the country and examine how frugal and advanced ICT innovations can address service disruptions during crises. There is limited research on COVID-focused, ICT-mediated HIV services in the Philippines (i.e., Eustaquio et al., 2022), which only focused on clients rather than the experiences of CBO-based volunteers. We argue that the volunteers’ perspectives can provide insights into the availability, design, and implementation of these ICT strategies for HIV care and inform technology-based practices and systems during the pandemic and beyond. Therefore, this descriptive qualitative study aims to describe the use of ICT in providing HIV services during the COVID-19 pandemic as experienced by CBO volunteers.

2. Methods

2.1 Research design

The present study used a qualitative descriptive research design to address the research goal of examining the use of ICT in addressing the challenges of delivering HIV-related services during the COVID-19 pandemic. Qualitative descriptive research is employed when an analogy of what, where, when, and why an event or experience is sought (Holly, 2014).

2.2 Setting and participants

The study was conducted in the National Capital Region of the Philippines wherein the highest rates of HIV in the country were noted in the past decade (DOH Epidemiology Bureau, 2022). Using snowball sampling, the researchers were able to recruit sixteen (16) participants with the following eligibility criteria: (1) age between 18 to 59 years old; (2) must be an active volunteer of any community-based organization in NCR providing HIV services during the period

of the COVID-19 pandemic; (3) must be using ICTs in providing HIV services; (4) must have access to Internet and gadget/s to participate in videoconferencing-facilitated interviews. HIV-focused CBOs endorsed the initial interviewees, who in turn, referred the subsequent informants. The participants were contacted via email and/or the cellphone numbers provided by the CBO heads and were introduced to the study. The study reached data saturation and ended the recruitment at the 16th participant. Table 1 shows the characteristics of the key informants.

Table 1. Profile of the participants (n=16)

Participant	Age	Gender	Nature of Organization	Educational Attainment	Nature of Work
P1	37	F	Non-Government Organization for HIV	High School Graduate	General Volunteer
P2	30	M	Non-Government Organization for HIV	College Graduate	Peer Navigator
P3	37	F	Non-Government Organization for HIV	Vocational	General Volunteer
P4	32	F	Non-Government Organization for HIV	College Undergraduate	General Volunteer
P5	30	F	Non-Government Organization for HIV	College Undergraduate	General Volunteer
P6	35	F	Hygiene Clinic	College Graduate	HIV/AIDS Coordinator
P7	33	F	Non-Government Organization for HIV	High School Graduate	General Volunteer
P8	30	M	Non-Government Organization for HIV	Vocational	HIV Counselor
P9	36	M	Non-Government Organization for HIV	College Graduate	HIV Case Manager
P10	34	M	University	Masters Graduate	HIV Care Provider
P11	44	M	Hygiene Clinic	College Graduate	HIV Case Manager
P12	42	M	Hygiene Clinic	Vocational	Peer Educator
P13	42	M	Hygiene Clinic	Vocational	Peer Educator and Fear Navigator
P14	45	M	Non-Government Organization for HIV	College Graduate	Organizational Manager
P15	24	F	Non-Government Organization for HIV	High School Graduate	General Volunteer
P16	28	F	Non-Government Organization for HIV	College Undergraduate	General Volunteer

2.3 Data collection

Once participants signified their voluntary intent to participate in the study, they were asked to sign the informed consent form via email. After recruitment, each participant was scheduled for an interview based on their free time. Semi-structured interviews were conducted and audio-recorded via a videoconferencing application. The interview was facilitated by an interview guide (see Table 2), validated by two health social scientists with experience in sexual health and volunteer work. During the first five minutes of each interview, the participants were reoriented about the objectives and procedures of the study, including their rights as research subjects. The videos for the participants were turned off, and their names were changed to protect their privacy. The interviews ranged from 30 minutes to 1 hour. Follow-up questions were asked as needed to probe for more insights regarding their responses. Each participant was interviewed once.

Table 2. Interview guide

Open-Ended Questions	
1.	What HIV or AIDS-related services do you personally perform at your organization?
2.	How long have you worked in HIV and AIDS care?
3.	Describe your daily routine on a typical volunteer day.
4.	How do you provide HIV-related Care Services during the pandemic? How is it different from the way you provided these services prior to the pandemic?
5.	How do HIV Care providers like you utilize the ICT in delivering HIV-related care services and medications needed by your patients? (For each ICT Technology used) How do you use this particular technology?
6.	How was your experience in using these technologies?
7.	Can you describe the effectiveness of using ICT in HIV-related services?

2.4 Data analysis

The analytic technique was inductive qualitative content analysis, which was used to develop frameworks emerging from themes from verbalized and printed materials (Elo & Kyngas, 2008). First, the authors transcribed all the audio-recorded interviews. All the transcripts were then read and reread to get a sense of the whole. We extracted significant interview statements that were pertinent to the phenomenon of interest. The responses were then collapsed into broad categories based on their similarities and differences. To link the extracted data with the purpose of the study, interpretations based on the common patterns found were deduced into common themes and sub-themes (and lower level categories, if applicable). Lastly, the organized answers were connected to form a general description of the participants' experiences in utilizing ICT for HIV-related services. In general, analyses were done using a consensual process, wherein members jointly coded the interview transcripts during weekly meetings and practiced voting and vigorous discussions when disagreements arose.

2.5 Trustworthiness

Adhering to the principles of trustworthiness for qualitative research (Stahl & King, 2020), this study ensured credibility by employing strict privacy measures to facilitate authenticity and honesty in the responses. For transferability, the study's specific context was clarified, as discussed in the introductory section of this paper. For dependability and confirmability, the research team met weekly to discuss our data collection and analysis process to ensure that they were consistent. The themes were presented to nurses and social scientists for expert validation. The research team also recorded and stored the memos for the meetings during our consensual analysis sessions.

2.6 Ethical considerations

Our study's protocol adhered to the principles of the Declaration of Helsinki and the Data Privacy Act of the Philippines and was approved by the De La Salle University Integrated School Ethics Review Committee (STEM12L-10-13-2021). Informed consent was secured prior to interviews. Verbal permission was sought to record interviews. Participants were assigned pseudonyms to protect their identity. All the personal information of the interviewees was secured and kept confidential. All recordings and transcripts were stored in an encrypted cloud accessible only to the research team.

3. Results

3.1 Characteristics of participants

The majority of the participants were in their 30s (n=10, 62.5%), working in non-government organizations (n=11, 67.9%), college graduates (n=5, 31.3%), and were general volunteers (n=7, 43.8%) as seen in Table 1. The insights that emerged from the interviews depicted the COVID-19 context that induced the need for ICT interventions, demonstrated the various ways ICT was used to sustain HIV care during the pandemic, and the difficulties experienced in using ICT for HIV.

3.2 The use of ICT in providing HIV services

The study found two themes and six sub-themes showing the use of ICT by the volunteers in providing HIV services. ICT-facilitated solutions and challenges in using ICT solution for HIV services during the COVID-19 pandemic were two themes generated from the data analysis.

Table 3. Overview of themes and subthemes

Theme 1. ICT-facilitated solutions for HIV services during the COVID-19 pandemic	Theme 2. Challenges in using ICT solutions for HIV services during the COVID-19 pandemic
Subtheme 1.1. ICT-facilitated HIV prevention initiatives <ul style="list-style-type: none"> - Category 1.1.1. Social media for educational campaigns - Category 1.1.2. Videoconferencing applications for HIV-related seminars - Category 1.1.3. Maximizing the use of private messaging applications 	Subtheme 2.1. Limited accessibility Subtheme 2.2. Increased work demands Subtheme 2.3. Lack of human connection
Subtheme 1.2. ICT-facilitated HIV testing promotion <ul style="list-style-type: none"> - Category 1.2.1. Facebook for HIV testing promotion - Category 1.2.2. Dating sites for HIV testing promotion 	
Subtheme 1.3. ICT-facilitated treatment support for PLHIVs <ul style="list-style-type: none"> - Category 1.3.1. Online-based courier services for drug delivery - Category 1.3.2. ICTs for treatment service coordination - Category 1.3.3. ICT tools for psychological support 	

3.2.1 ICT-facilitated solutions for HIV services during the COVID-19 pandemic

There were three sub-themes of this theme, including ICT-facilitated HIV prevention initiatives, ICT-facilitated HIV testing promotion, and ICT-facilitated treatment support for PLHIVs.

3.2.1.1 ICT-facilitated HIV prevention initiatives

Social media for educational campaigns was the first category. Due to the restriction of mass gatherings, all events are held on online platforms, providing less risk compared to meeting in person. P1 shared, "... We are not allowed to go from house to house... No crowds are allowed to congregate, so we do our HIV education online....". Also, announcements regarding HIV activities are made online, with the HIV clinics and CBOs utilizing their own social media pages. Also, the volunteers continued their awareness drives through follower networks on social media and internal announcement systems of partner private companies. Then these campaigns are circularly shared on various platforms. Participant 10 mentioned: "We have a social media component that includes different information about offline or on-the-ground tasks ... depending on whether the post was shared by the school or an organization, we also re-share it on our page." (P10)

Videoconferencing applications for HIV-related seminars was the second category. The pandemic-induced restrictions related to social distancing and in-person trainings prompted the volunteers to transition their lectures and seminars to online platforms; as said by P8, "...during the height of COVID and social distancing, we transitioned our face-to-face trainings to Zoom."

For HIV-related awareness events and training programs, videoconferencing applications such as Zoom had been used. One participant reported, “We [case managers and doctors] explain HIV, how someone could get it, what they should avoid, and what they need to do. It is an orientation conducted via Zoom” (P3). The participants have positive attitudes towards the affordances provided by these applications and the ability of the webinars to accommodate audiences who are distant from them. P16 mentioned, “I think these webinars are OK. They make remote teaching easy. The process is simple. They really helped during the pandemic.”

Maximizing the use of private messaging applications was the third category. The use of private messaging was already utilized even before the COVID-19 pandemic started. Online platforms are more utilized as all communications are done remotely. One participant (P10) verbalized, “On the line of prevention, we kind of intensified our campaign ... We have people working and answering queries on our social media pages and then scheduling them for consultation—that is our adaptation.” Some private messaging applications used, according to P8, were those that were embedded in “Facebook” and “Grindr.” Some participants noticed that certain queries would be brought up more often than others. To address this, some of the volunteers employed chatbots on private messaging on social media pages. P10 explained, “If a specific keyword appears in the chat, the chatbots automatically answer the client’s queries.”

3.2.1.2 ICT-facilitated HIV testing promotion

Facebook for HIV testing promotion was one category of this sub-themes. According to P14, “during COVID-19, HIV testing became constrained.” One solution for this issue was to use social media. P6 explained, “Our best solution was to utilize social media. Wherein Facebook is the medium... to invite people who want to test whether they have HIV or not.” Some participants used their social media presence to encourage people to take HIV tests, as reported: “...on my personal Facebook account, I joined different groups so I can invite and encourage people in LGBTQ+ groups.” (P11)

Dating sites for HIV testing promotion was another category. Dating sites, such as Grindr, were also used to find clients who would like to get tested for HIV. Some volunteers noted that they were active in HIV testing campaigns in Grindr because they had observed high sexual risk behaviors among users of the said application; “...we really reach out to the LGBT community online through dating apps because they may be exposed to more risk” (P2). Participants further claim that this gay dating site had been the source of many individuals who eventually became HIV seropositive after getting tested. P2 added, “most of our clients who turn out to be positive come from Grindr.” The volunteers created an account on Grindr and indicated the HIV services they could provide for potential clients who might reach them via the application. A participant illustrated “... for my Grindr profile... I also put there that I offer free HIV testing and counseling.” (P5)

3.2.1.3 ICT-facilitated treatment support for PLHIVs

Online-based courier services for drug delivery was the first category. Aside from the fact that mobility during the pandemic was constrained, the volunteers were concerned about making PLHIVs travel on their own to get their ARTs. At the same time, there was a threat of getting infected by the novel coronavirus, as said by a participant “Treatment and drug dispensing facilities had to hold their services, especially since these facilities also care for COVID patients” (P2). To address this, the volunteers used online courier and delivery applications (such as Lalamove and Grab in the Philippines) to send the medications to the clients to reduce the risk of infection. One participant (P9) explained, “One of the transitions that happened in treatment services is that the antiretroviral drugs are now being delivered ... so they get their ARV drugs by using ‘Lalamove’ or any other delivery services.” (P9)

ICTs for treatment service coordination was the second category. Along with the limited face-to-face interaction, service coordination done by volunteers for doctors and PLHIVs also became problematic. P7 disclosed, “...hospitals and doctors are very busy... sometimes the line is so long... it sometimes takes one to two days before I can contact hospital personnel....” This prompted the rise of telemedicine and remote consultations. A range of ICTs were used for this purpose; as P10 enumerated, “...for clients who need these services, they can reach out to us through text, through call, through direct messaging, through Twitter, through wherever... they’re all in these platforms.” For instance, two participants shared, “we used text messaging to link clients with

hospitals or treatment hubs.” (P7) and “...[analog] calls are still relevant in coordinating the care of PLHIVs... especially when in areas with poor exposure to cell sites.” (P14)

ICT tools for psychological support was the third category. Some volunteers say that during COVID-19, they maintained their communication and social media lines open so that their clients could contact them for any mental health and wellbeing needs. A participant shared, “...for our e-consultations, our patients send their problems to our official FB page... They inform us of their problems and send photographs to describe their concerns....” (P6). P11 added that online group chats could be an avenue for volunteers and other clients to look after the mental health of one another. One participant confirmed that these strategies helped, claiming, “...these communication lines help to lessen their negative feelings and worries.” (P9)

3.2.2 Challenges in using ICT solutions for HIV services during the COVID-19

There were three challenges in using the ICT solution for HIV services during the COVID 19 namely, limited accessibility, increased work demand, and lack of human connection.

3.2.2.1 Limited accessibility

Despite the perceived utility of ICT-facilitated solutions for HIV service delivery, the volunteers noted that for some of the clients and providers, accessibility to the tools and resources needed to use ICT may be constrained. For instance, participant 6 (P6) explained that some clients may be financially disadvantaged, “Our patients come from all walks of life. We have patients who are garbage collectors who don't have the means. They don't have cellphones; they don't have internet connection for e-consultation.”

Moreover, the volunteers lamented the limited coverage and reliability of internet services, especially in remote areas. P3 stated, “...sometimes the connection will just suddenly be interrupted while we are in the middle of an activity. If you are outside, away from Internet connection, you will not be able to attend to needs urgently.”

3.2.2.2 Increased work demands

The creation and implementation of these ICT-facilitated services were additional tasks that come on top of their usual workloads as volunteers. P1 explained, “...there are so many queries coming in... If you are going to create a page, you have to ensure that there is someone assigned to a certain time slot... to monitor this and that.” Some volunteers lamented that managing these ICT solutions and dealing with clients infringed on their personal and family time. P6 shared, “...sometimes they contact you during midnight and wee hours in the morning... unlike during face-to-face services, they know that our office hours are only from 8 to 5.”

3.2.2.3 Lack of human connection

Some volunteers expressed that they are not satisfied with their ICT-mediated interactions with clients, claiming that they lack the “human touch” to make these interventions more effective. P12 disclosed, “...I really prefer face-to-face, because I can explain more clearly and you can make them feel that you empathize with them, compared to just sending them the paraphernalia....”

P6 explained that it was harder to physically assess the patient in an online consultation. P10 says that in face-to-face interactions, he could “...see their reactions... their gestures.” P14 also added that “teaching new HIV counselors online is harder...” than in-person training.

4. Discussion

This study examined how volunteers use ICT to deliver HIV services during the COVID-19 pandemic using a qualitative research approach. In summary, our findings reveal ICT solutions in providing HIV services in the time of COVID-19, which included the use of social media, mobile technologies, and other common and emerging digital tools for prevention, testing and support for treatment. However, with the use of these technologies, there were some challenges and difficulties that volunteers experience in delivering care. To our knowledge, this is the first ASEAN-based study that explored pandemic-induced, ICT-facilitated HIV social services from volunteers' perspectives. In further discussing insights from our findings, this section was divided into two parts: one part per major theme.

4.1 *ICT solutions for HIV services among volunteers*

The present study demonstrates how the HIV volunteers were able to implement a diverse range of ICT-facilitated solutions to ensure that the various aspects of HIV services are available and the care needed by PLHIVs is maintained despite the difficulties posed by the pandemic. In this current study, the solutions were conceptualized based on the general types of HIV services provided by volunteers: prevention, testing, and treatment support. Thematic insights reveal many ICT-based strategies that had been already useful pre-pandemic but intensified during quarantine periods. For instance, the use of social media, messaging applications, and dating sites for HIV awareness campaigns, testing promotion, and treatment coordination had been proven efficient and effective by studies done before (Simoni et al., 2015; Sianturi, 2015; Young & Chiu, 2014) and during the time of COVID-19 (Quiao et al., 2020; Smith & Badowski, 2021) in the Philippines and elsewhere.

Furthermore, volunteers also shared new ICTs that gained prominence during the pandemic. This included the rise of videoconferencing applications for webinars instead of in-person seminars. Prior research has demonstrated the utility and ubiquity of videoconferencing for educational purposes and telemedicine has become in the time of COVID-19 (Sidpra et al., 2020; Włodarczyk et al., 2020), and its usefulness extends to HIV education, as evidenced by our results.

Another emerging ICT solution for HIV is using online-based courier services for medicine distribution, which replaced the usual practice of the client traveling to the treatment hubs to receive the pharmaceutical supplies. Despite the added costs of delivery services, it ensures the continuity of ART for PLHIV experiencing transportation restrictions, while still being served by their official treatment hub. Many of these ICT solutions demonstrate some of the recommendations of the scholarly work of Quilantang et al. (2020), who proposed using online tools and courier services for HIV care amid the pandemic.

4.2 *Challenges in using ICT tools for HIV services among volunteers*

Finally, another novel finding in the context of pandemic-related ICT-based HIV services that we gleaned from the insights of the volunteers is the challenges they experienced during provision of services. These include reliability of Internet technologies, the tiring nature of online-mediated services and the decreased sense of human touch in these services.

As mentioned, the first of these issues was the accessibility of the Internet and gadgets for volunteers and clients. Evidence in the field of education and telemedicine also notes this as a major hurdle in providing optimal services (Cleofas, 2021; Cruz-Lim et al., 2021). This is unsurprising in the Philippines, which has the worst Internet quality in the ASEAN region (Barreiro, 2017). Second issue was the increased job demands among volunteers who must manage these ICT solutions and deal with the “always-on” nature of these technologies. There was a blurring boundary versus their personal time since the clients had easier contact with them. This confirms earlier evidence, which indicates the prevalence of technostress among health and caregivers from different professions during the time of COVID-19 (Camacho & Barrios, 2022). The last issue was the volunteers’ dissatisfaction with the lacking human aspect of ICT-mediated interventions. Participants felt that they were not providing optimal personal care in digitally mediated encounters with their clients. This thematic finding is corroborated by previous research that notes the importance of close contact during counseling as seen in a study in Indonesia (Hasanah et al., 2019). The lack of warmth and sense of social connection in various forms of telehealth care has also been noted by recent pandemic evidence (Smith & Badowski, 2021).

5. **Implications and limitations**

As the Philippines and the rest of the world enter a post-pandemic world, Community-based HIV nurses, CBOs, and other HIV organizations must take advantage of the lessons learned using ICT innovations during the pandemic. The use of online and digital resources to accommodate clients affected by travel restrictions can be sustained even after the pandemic to reach PLHIVs and other priority populations found in remote areas of the country. Community-based HIV nurses at CBOs are encouraged to document the practices that emerged during the pandemic and codify these processes through guidelines and manuals so that these innovations can become part of organizational culture. Monitoring and evaluation mechanisms on using these ICT-based solutions can help ensure that the strategies used remain relevant to the clientele's needs. On top

of HIV-related knowledge and skills, community-based nurses and HIV volunteers may also need to be capacitated on using ICTs. In line with the issues regarding increased task demands with the use of ICTs for HIV services, formal norms on official service hours of volunteers for non-emergency concerns must be communicated to the clients during the first contact. Managers of CBOs should also be mindful of the workload of nurses and volunteers, strategize the distribution of tasks and promote regular periods of rest. Government, private and civil society organizations can be tapped for support for subscription to reliable Internet services and gadgets to improve the ICT-facilitated health services of volunteers. When COVID-19-related restrictions become fully lifted, hybrid (online and offline) forms of tele-education, telemedicine, and tele-counseling services can be designed and implemented to take advantage of the greater reach afforded by digital technology while also ensuring the humanistic aspects of healthcare, social services, and HIV education are also addressed. Nursing informatics courses may include these findings in the syllabus so nursing students can appreciate how ICT facilitates the innovation of health care of nurses and other allied health professionals and advocates.

The findings of the study must be viewed considering its limitations. First, due to time constraints and the ethics review advice to limit exposure of participants who may be dealing with sensitive issues, prolonged engagement, and member checking were not done. Second, given the mobility restrictions of the pandemic, triangulation was not implemented.

6. Conclusion

Based on the findings, we concluded that HIV volunteers have used various tools and implementations of ICTs to ensure the continuity of care during the COVID-19 pandemic. Notwithstanding the challenges of integrating ICT in health services, the dynamic and multifunctional nature of currently available information and communication technologies can help fill multifaceted gaps in HIV service provision. The present study contributes to the broader literature on HIV volunteerism and nursing informatics during crisis situations and technology-facilitated HIV care by highlighting the importance of various ICT-based solutions that can augment the delivery of HIV services and ensure the continuity of care for clients during the critical period of the COVID-19 pandemic. Future researchers can conduct formal evaluations of these ICT strategies using quantitative methods. Future researchers can also replicate the study in other geographical locations in the Philippines (such as Visayas and Mindanao, Central and Southern island groups in the country, respectively) and employ multiple data collections such as participant observations in the use of ICT tools. Online ethnographies can also be used to analyze archival data generated by these ICT-mediated services.

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Author contribution

MCSC, FIUDC, LZSDC, AFQM: Initial protocol development, ethics processing, interviews and data processing, initial consensual qualitative analyses, initial manuscript writing. JVC: Finalization of protocol, finalization of consensual qualitative analyses, final manuscript writing.

Conflict of interest

There are no conflicts of interest to declare.

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REVIEW

An Evaluation of Psychometric Properties of Needs Assessment Instruments in Patients with Coronary Artery Disease Undergoing Cardiac Rehabilitation Programs: A Systematic Review



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Article Info	Abstract
<p>Article History: Received: 1 January 2022 Revised: 10 August 2022 Accepted: 18 August 2022 Online: 31 August 2022</p> <p>Keywords: Cardiovascular rehabilitation; coronary artery disease; COSMIN checklist; instrument needs assessment</p> <p>Corresponding Author: Neda Sayadi Nursing Department, Nursing Care Research Centre in Chronic Disease, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Email: sayadi_neda@yahoo.com</p>	<p>Background: Coronary Artery Disease (CAD) is the foremost reason of illnesses and death in the world. Assessment of the needs is a priority in these patients. However, there is a paucity of tools for the evaluation of needs, with the controversy surrounding their validity.</p> <p>Purpose: This review aimed to evaluate the psychometric properties of tools used to assess needs of patients with CAD undergoing cardiac rehabilitation (CR) plans.</p> <p>Methods: An online literature search combined with manual search was carried out on 11 databases to identify relevant articles. The terms used in the search were: cardiac rehabilitation AND coronary artery disease, cardiac rehabilitation AND acute coronary syndrome, and questionnaires OR need assessment OR tool OR scale. Articles from 1989 to 2021 were selected using some inclusion criteria and no validation studies were excluded. The quality of the questionnaires was evaluated by researchers using consensus-based standards for the selection of health status measurement instruments (COSMIN) list. Data analysis had been done by calculating overall methodological quality scores per study on a measurement property using COSMIN checklist. A methodological quality score per box was obtained by taking the lowest rating of any item in a box ('worse score counts').</p> <p>Results: Of 653 articles, 15 papers were involved in the study. Six studies reported cross-cultural validity, nine studies for criterion validity, and none reported measurement error, hypothesis testing, and responsiveness. There is no vigorous and valid single scale for the measurement of needs in CAD patients. Overall, the CADE-Q questionnaire was good and a patient self-assessment tool for cardiac rehabilitation was poor based on psychometric properties.</p> <p>Conclusions: The findings of this study disclosed that even though it has been more than 32 years, from 1989 to 2021, of the development in need assessment instruments, each instrument has as a minimum of one "poor" psychometric property according to the COSMIN checklist. So, it is recommended for the next studies to design and develop instruments with better psychometric validities for clinical environment.</p>

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1. Introduction

Cardiovascular illness is the principal reason for death in the world (Vasan et al., 2016). Patients with Coronary Artery Disease (CAD) are at high risk of recurring cardiovascular events. In spite of the progress in pharmacological and invasive cure approaches, risk factors remain independent forecasters of cardiac death in patients with CAD (De Bacquer et al., 2013).

Consequently, secondary prevention constitutes a crucial part of the current care of patients by cardiovascular illness. The expression "Cardiac Rehabilitation" (CR) refers to coordinated complex interventions planned to enhance a cardiac patient's physical, mental, and social performance, as well as steadying, reducing, or even reversing the development of the causal atherosclerotic progressions, thus decreasing morbidity and mortality (Anderson et al., 2016). As such, CR or secondary prevention plans deliver a critical and cost-effective situation to bring applicable preventive care (Balady et al., 2007). Because of the low quality of life in patients with

CAD particularly in patients undergoing surgery (Fayyazi et al., 2012), a participation in CR and education programs has been established to be related to an enhanced lifestyle and an improved diagnosis after an acute coronary occasion (Perk et al., 2012; Ahyana et al., 2013). These programs are aimed at reducing risk factors and maintaining individuals in ideal physical, psychological, social, and functional conditions (Dibben et al., 2021).

The main activities pursued in a CR program include education, a recommendation for lifestyle modification, risk factor management, psychosocial assistance, secondary prevention, and lasting management plans (Fawcett & Desanto-Madeya, 2012). CR contains four main phases that are phase I (the acute phase), phase II (the sub-acute phase), phase III (the intensive outpatient therapy phase), and phase IV (the self-governing continuing conditioning phase). The first phase of nursing care in all phases of CR is to recognize patients' needs. The result of the research by Mohammadi et al. (2019) showed that the care needs of the patients with CAD in phase I CR including physical, psychological, social, and spiritual care needs. Physical care needs included aspects such as providing patients with information regarding the characteristics of CAD, sexual and physical activities after hospital discharge, post-discharge dietary regimen, medications, physical exercise, smoking cessation, wound care, self-care during physical activity, follow-up medical visits, and CAD signs and symptoms. Psychological care needs were mainly related to stress and anxiety management and depression prevention. Social care needs covered aspects such as social relationships after getting discharged from hospital and returning to work and other social activities (Mohammadi et al., 2019).

In particular, the educational supportive role of nurses by Orem in the process of CR has been expressed and the focus of the nurse in this section is to accurately identify the social, emotional, and physical needs of patients and give appropriate training to them since providing these programs is beyond their ability due to the limited time available to nurses. Having a valid and reliable assessment tool in a clinical setting to assess the needs of the patient and his family can compensate the time limit of nurses and increase the effectiveness of the rehabilitation program (Naghdi et al., 2016). Despite the advantages of CR and the major activities carried out in this regard, there is a paucity of tools for the evaluation of needs, with the controversy surrounding their validity which means that sometimes the author did not implement or did not completely report the psychometric properties of the tools (Fawcett & Desanto-Madeya, 2012). Indeed, one of the critical issues today in studies of this field is the selection of appropriate and relevant assessment tools (Naghdi et al., 2016). In addition, before the selection of a tool, it is vitally important that psychometric properties be evaluated based on appropriate criteria (Mokkink, Terwee, Knol et al., 2010).

The consensus-based standards for the selection of health status measurement instruments (COSMIN) checklist, a tool for evaluating the methodological quality of studies on the measurement properties of health status questionnaires, has been developed as the tool of choice in recent years (Mokkink, Terwee, Knol et al., 2010). Utilizing the COSMIN checklist makes it likely to disapprovingly assess and evaluate the quality of these studies (Menezes Costa et al., 2009). This checklist can be used in systematic review studies to examine the features of the scale with the same purpose. Tool choice must be according to high-quality studies, and the COSMIN checklist can be used as a guide for developing tools and reporting features of instrumental scales in studies (Mokkink, Terwee, Knol et al., 2010).

Nonetheless, although the assessment, planning, and implementation of effective interventions in the CR domain call for precise measurement, and evaluation of CR needs appropriate tools, no systematic review on CR questionnaires to date delivers an explained appraisal on the methodological quality of the studies. Therefore, the objective of present review is to recognize scales that investigate needs in patients with CAD undergoing CR and evaluate the psychometric properties of the instruments.

2. Methods

2.1 Research design

This study is a systematic review of studies that assessed the psychometric properties of needs in patients with CAD undergoing CR programs. Also, this review was done in 2021 and in accordance with the Favoured Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) strategies.

2.2 Search methods

An online literature search was carried out by two research members (NS & KZ) on MagIran, IranMedex (Indexing articles published in Iranian biomedical journals), ISC (Islamic World Science Citation), SID (Scientific Information Database – a Persian database), PubMed, MEDLINE, CINAHL (via EBSCO), Scopus, Wiley, EMBASE (via OVID), and Web of Science to identify relevant articles. The terms used in the search were: cardiac rehabilitation AND coronary artery disease, cardiac rehabilitation AND acute coronary syndrome, and questionnaires OR need assessment OR tool OR scale. The words were applied as keywords or free-text words in all databases except for PubMed, in which Mesh terms were used. The search was supplemented with a separate search for the recognized questionnaires in addition to the authors of these questionnaires. The titles of the related references were searched, and the full texts of the articles meeting the inclusion criteria were studied (Figure 1).

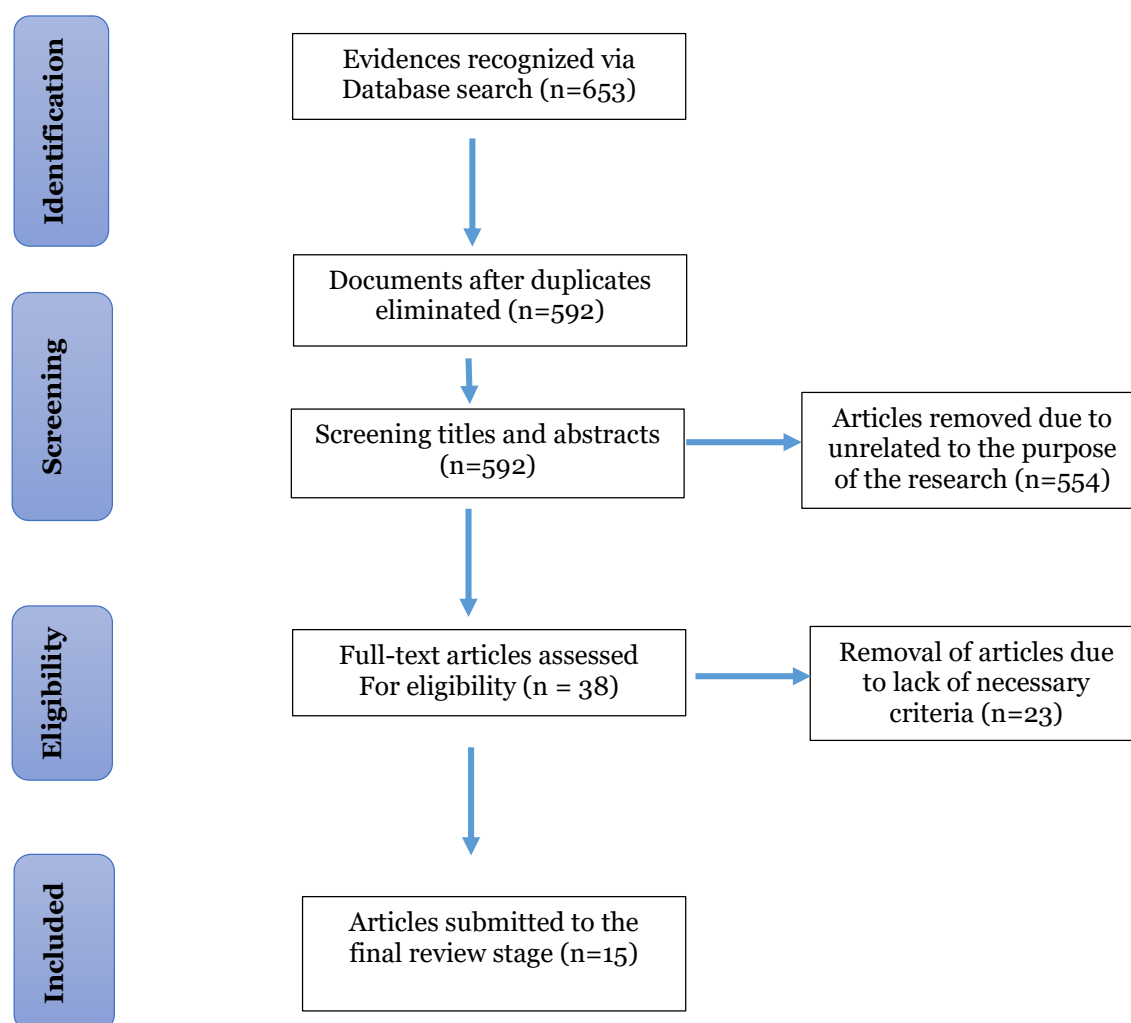


Figure 1. PRISMA flowchart

2.3 Inclusion and exclusion criteria

Articles were included in this study if they were: full-text (original articles), published in English or Persian, published in peer-review journals, and concerned with the development or assessment of the measurement properties of an original form of a need assessment in CR programs questionnaire. Abstracts without full articles, review/systematic review articles, and conference articles were excluded from the study. As per Terwee et al. (2007) standards, publications counted as editorials and case reports were also omitted.

2.4 Screening of articles

Two investigators (NS & KZ) individually assessed titles and abstracts of the recognized records for possible inclusion in the study and evaluated full texts for eligibility by applying the inclusion and exclusion criteria. As can be seen from Figure 1, after screening the titles and abstracts, 554 articles were removed as they were unrelated to the research's purpose. The investigators selected the full-text articles based on the inclusion and exclusion criteria, leaving 15 articles for final review. The investigators determined differences regarding inclusion and exclusion criteria by discussion until they reached an agreement. If agreement could not be reached, the last decision was made by third and fourth investigators (EM & JA).

2.5 Data extraction

Data were extracted from included articles by two research members (NS & KZ) into Table 1 (See Appendix 1). This was carried out in order to summarize the need assessment scales and narrative findings of psychometric characteristics of the scales derived from the included studies.

2.6 Quality appraisal

The methodological quality of articles was assessed using the Consensus-based Standards for the selection of health Measurement Instruments (COSMIN) checklist by NS & KZ. When agreement could not be reached between two investigators, the last decision was made by the third and fourth investigators (EM & JA).

The COSMIN checklist has newly been improved and available by Mokkink, Terwee, Patrick et al. (2010). The COSMIN list is according to a global Delphi study contributed by 57 experts. Delphi technique considered the most appropriate method to develop a checklist on the methodological quality of studies on measurement properties. Within this Delphi study, the authors have had many interesting discussions, and reached consensus on a number of important issues about the assessment of measurement properties. Therefore, this checklist has been verified to have a suitable inter-rater agreement and reliability (Mokkink, Terwee, Knol et al., 2010). The COSMIN checklist involves twelve boxes. Nine of these boxes denote methodological standards for studies on measurement properties: A) internal consistency, B) reliability, C) measurement error, D) content validity, E) structural validity, F) hypotheses testing, G) cross-cultural validity, H) criterion validity, I) responsiveness. Box J) contains two standards for the interpretability of patient-reported outcomes. Besides, the COSMIN checklist delivers assessment criteria for articles that use the Item-Response-Theory (IRT box) and generalizability of the results (Generalizability box). Each of the boxes A) to I) and the IRT box consists of several items regarding design necessities and statistical analyses.

The scoring system of COSMIN checklist indicated in Table 2-7 (See Appendix 2). The items can be scored on a four-point rating scale representing options for poor, fair, good, or excellent quality. The overall score of the quality of each psychometric property is defined as the lowest score of any item within the box, following the "worst score counts" method. For example, for a reliability study, if one item in the box 'Reliability' is scored poor, the methodological quality of that reliability study is esteemed as poor. At the COSMIN website (www.cosmin.nl), the authors indicate that the checklist mainly emphasizes standards for studies that examine psychometric properties of Health-Related Patient-Reported Outcomes (HR-PROs) (Mokkink, Terwee, Patrick et al., 2010). The quality appraisal of the involved articles is presented in Table 8.

2.7 Data analysis

As this study investigated the psychometric properties of the scales from the articles, the data analysis had also been done by using COSMIN checklist (Table 8). After all studies were assessed their psychometric components using nine boxes (box A-I) in the COSMIN checklist, the authors (NS & KZ) analyzed the data according to overall quality of the scales and each box of the COSMIN checklist.

3. Results

3.1 Study characteristics

As presented in the PRISMA flow chart (Figure 1), 653 articles were found in the first search. Afterward omitting doubled and irrelevant studies, 15 studies remained. The search identified 7

different questionnaires relating to need assessment in patients with CAD undergoing the CR program.

Table 8. COSMIN quality assessment

First author (year)	COSMIN BOXES								
	BOX A INTERNAL consistency	BOX B Reliability	BOX C Measurement error	BOX D Content validity	BOX E Structural validity	BOX F Hypothesis testing	BOX G Cross- cultural validity	BOX H Criterion validity	BOX I Respon- siveness
De Melo Ghisi et al. (2010)	Good	Poor	NR	excellent	Good	NR	-	-	NR
De Melo Ghisi, Oh et al. (2013)	Good	Poor	NR	excellent	Good	NR	Good	Poor	NR
Marofi et al. (2020)	Good	Poor	NR	excellent	Good	NR	Good	-	NR
De Melo Ghisi et al. (2015)	Good	Poor	NR	excellent	Good	NR	-	Poor	NR
Chen et al. (2018)	Good	Poor	NR	excellent	Good	NR	Good	Poor	NR
Santos et al. (2019)	Poor	Poor	NR	excellent	Poor	NR	Good	Poor	NR
De Melo Ghisi et al. (2016)	Poor	Poor	NR	excellent	Poor	NR	-	Poor	NR
De Melo Ghisi et al. (2018)	Good	Poor	NR	excellent	Good	NR	Good	Poor	NR
De Melo Ghisi & Oh (2021)	Good	Poor	NR	excellent	Good	NR	Good	Poor	NR
De Melo Ghisi, Grace et al. (2013)	Poor	Poor	NR	excellent	Poor	NR	-	Poor	NR
De Melo Ghisi et al. (2014)	Poor	Poor	NR	excellent	Poor	NR	Good	Poor	NR
Sayadi et al. (2021)	Good	Poor	NR	excellent	Good	NR	-	-	NR
Van Engen-Verheul et al. (2012)	Poor	Poor	NR	excellent	Poor	NR	-	-	NR
Smith et al. (2015)	Poor	Poor	NR	excellent	Poor	NR	-	-	NR
Phelan et al. (1989)	Poor	Poor	NR	excellent	Poor	NR	-	-	NR

Note. NR: not reported

These questionnaire consisted of: (1) A patient self-assessment tool for cardiac rehabilitation, (2) the cardiac rehabilitation needs assessment tool (CRNAT), (3) the information needs in cardiac rehabilitation (INCR) tool, (4) the coronary artery disease education questionnaire (CADE-Q), (5) the second version of the coronary artery disease education questionnaire (CADE-Q II), (6) short version of the coronary artery disease education questionnaire (CADE-Q SV), (7) care needs questionnaire in phase 1 cardiac rehabilitation for patients with coronary artery disease (CNCR-Q). The rest of the articles (n=7) of included studies showed the cross-cultural validation of these questionnaires in other countries and one study was an algorithm about need assessment for the patient in CR.

Involved studies were available from the year 1989 to 2021. All studies were peer-review original articles. Majority of the studies (n=5) were showed in the Canada (De Melo Ghisi et al., 2016; De Melo Ghisi et al., 2015; De Melo Ghisi, Grace et al., 2013; De Melo Ghisi & Oh, 2021; De Melo Ghisi, Oh et al., 2013) followed by Iran (n=2) (Marofi et al., 2020; Sayadi et al., 2021), Brazil (n=4) (De Melo Ghisi et al., 2010; De Melo Ghisi et al., 2018; De Melo Ghisi et al., 2014 Santos et al., 2019), China (n=1) (Chen et al. 2018), Australia (n=1) (Smith et al., 2015), Netherlands (n=1) (Van Engen-Verheul et al., 2012) and USA (n=1) (Phelan et al., 1989).

3.2 Quality evaluation of the studies

The results showed that the concept of need was investigated in all studies. Overall the CADEQ questionnaire was good based on psychometric properties. Respecting to the study design, seven articles were cross-cultural assessment studies (Chen et al., 2018; De Melo Ghisi et al., 2014; De Melo Ghisi et al., 2018; De Melo Ghisi & Oh, 2021; De Melo Ghisi, Oh et al., 2013; Marofi et al., 2020; Santos et al., 2019) and others were studied about design and psychometric properties of questionnaires (De Melo Ghisi et al., 2010; De Melo Ghisi et al., 2015; De Melo Ghisi et al., 2016; De Melo Ghisi, Grace et al., 2013; Phelan et al., 1989; Sayadi et al., 2021; Smith et al., 2015; Van Engen-Verheul et al., 2012).

The number of tool items and factors of involved studies were different. The maximum item number was 60 (De Melo Ghisi, Grace et al., 2013), the minimum number of dimensions were three (Marofi et al., 2020) and the maximum number was 11 dimensions in one study (Phelan et al., 1989).

Internal consistency was directed with estimating Cronbach's alpha and Kuder- Richardson-20 test. Intra-Class Correlation (ICC) and Spearman's rank correlation coefficient were used for stability in reliability. Educational level, family income, CR duration, and time of diagnosis were used as a criterion for criterion validity. Majority of studies had construct validity; exploratory factor analysis (n=6) (De Melo Ghisi et al., 2015; De Melo Ghisi et al., 2010; De Melo Ghisi et al., 2018; De Melo Ghisi & Oh, 2021; De Melo Ghisi, Oh et al., 2013; Sayadi et al., 2021), confirmatory factor analysis (n=1) (Chen et al., 2018), and exploratory and confirmatory factor analysis (n=1) (Marofi et al., 2020) while other studies did not report it. Other psychometric characteristics of involved studies are reviewed in Table 1. The results of the COSMIN quality assessment of 15 involved articles are provided in Table 8. None of these articles had "Excellent" quality in all psychometric properties.

3.3 BOX A – Internal consistency

Internal consistency is the extent to which items in a (sub)scale are intercorrelated, so assessing the equal construct (Terwee et al., 2012). In twelve studies, internal consistency calculated based on Cronbach alpha or Kuder-Richardson-20, (Chen et al., 2018; De Melo Ghisi et al., 2014; De Melo Ghisi et al., 2016; De Melo Ghisi et al., 2015; De Melo Ghisi et al., 2010; De Melo Ghisi et al., 2018; De Melo Ghisi, Grace et al., 2013; De Melo Ghisi & Oh, 2021; De Melo Ghisi, Oh et al., 2013; Marofi et al., 2020; Santos et al., 2019; Sayadi et al., 2021). The COSMIN checklist scores for four studies were "poor" because they did not calculate the factor analysis also the author did not reference to other studies (De Melo Ghisi et al., 2014; De Melo Ghisi et al., 2016; De Melo Ghisi, Grace et al., 2013; Santos et al., 2019) and eight studies were evaluated as "Good" because percentage of missing items were not explained. (Chen et al., 2018; De Melo Ghisi et al., 2015; De Melo Ghisi et al., 2010; De Melo Ghisi et al., 2018; De Melo Ghisi & Oh, 2021; De Melo Ghisi, Oh et al., 2013; Marofi et al., 2020; Sayadi et al., 2021). Three studies had not calculated internal consistency so the COSMIN score were "poor" (Phelan et al., 1989; Smith et al., 2015; Van Engen-Verheul et al., 2012).

3.4 BOX B – Reliability

Reliability is the degree to which patients can be discriminated from each other, despite measurement errors (relative measurement error) (Terwee et al., 2012). Ten studies had not calculated reliability so the COSMIN score was "poor" (Chen et al., 2018; De Melo Ghisi et al., 2016; De Melo Ghisi et al., 2015; De Melo Ghisi et al., 2014; De Melo Ghisi & Oh, 2021; De Melo Ghisi, Oh et al., 2013; Phelan et al., 1989; Sayadi et al., 2021; Smith et al., 2015; Van Engen-Verheul et al., 2012). The rest studies described reliability criteria and were estimated as "poor," because all of them used only one measurement (De Melo Ghisi et al., 2010; De Melo Ghisi et al., 2018; De Melo Ghisi, Grace et al., 2013; Santos et al., 2019).

3.5 BOX C – Measurement error

The systematic and random error of a score that is not attributed to true variations in the construct is measured as measurement error. Measurement errors of all studies were not stated.

3.6 BOX D – Content validity

The content validity is described as “the extent to which the domain of interest is comprehensively sampled by the items in the questionnaire”. Content validity of all studies were “excellent” because the content of questionnaire was evaluated by expert panels.

3.7 BOX E – Structural validity

According to the COSMIN checklist, structural validity is the degree to which the scores of scales are a sufficient indication of the dimensionality of the construct. In this regard, seven articles did not describe factor analysis and were appraised as “poor.” (De Melo Ghisi et al., 2016; De Melo Ghisi, Grace et al., 2013; Santos et al., 2019; De Melo Ghisi et al., 2014; Smith et al., 2015; Van Engen-Verheul et al., 2012; Phelan et al., 1989) and eight studies were evaluated exploratory or confirmatory factor analysis but proportion of missing items NOT defined, so COSMIN score were “good” (Chen et al., 2018; De Melo Ghisi et al., 2015; De Melo Ghisi et al., 2010; De Melo Ghisi et al., 2018; De Melo Ghisi, Oh et al., 2013; De Melo Ghisi, Oh et al., 2013; Marofi et al., 2020; Sayadi et al., 2021).

3.8 BOX F – Hypothesis testing

Hypothesis testing of all studies were not reported.

3.9 BOX G – Cross cultural

In this study, seven questionnaires were used. Cross-cultural adaptation was performed only for four questionnaires (De Melo Ghisi et al., 2010; De Melo Ghisi et al., 2015; De Melo Ghisi et al., 2016; De Melo Ghisi, Grace et al., 2013). Cross-cultural adaptation of INCR was done to the Portuguese language (De Melo Ghisi et al., 2014). Cross-cultural adaptation of CADE-Q were done to Persian and English language (De Melo Ghisi, Oh et al., 2013; Marofi et al., 2020). Cross-cultural adaptation of CADE-Q SV were done to French-Canadian and Brazilian-Portuguese language (De Melo Ghisi et al., 2018; De Melo Ghisi & Oh, 2021). Cross-cultural adaptations of CADE-Q II were done to Chinese and Brazilian language (Chen et al., 2018; Santos et al., 2019). The COSMIN score for all studies were “good” because the percentage of missing items is NOT defined.

3.10 BOX H – Criterion validity

Criterion validity is “the degree to which scores on a specific questionnaire relate to a gold standard” (Terwee et al., 2007). Nine studies were performed criterion validity. They used criteria such as duration of CR, monthly family income, and educational level of patients. The COSMIN score was poor because the criterion used could not be respected a sufficient gold standard (Chen et al., 2018; De Melo Ghisi et al., 2016; De Melo Ghisi et al., 2015; De Melo Ghisi et al., 2018; De Melo Ghisi et al., 2014; De Melo Ghisi, Grace et al., 2013; De Melo Ghisi & Oh, 2021; De Melo Ghisi, Oh et al., 2013; Santos et al., 2019).

3.11 BOX I- Responsiveness

Responsiveness is the ability of a questionnaire to distinguish clinically critical changes over time. Responsiveness of all studies was not reported.

4. Discussion

The aim of this study was to evaluate and recognize the best questionnaire according to psychometric properties. This review covered fifteen articles that used seven different questionnaires, namely the CRNAT, INCR, CADE-Q, CADE-Q SV, CADE-Q II, CNCR-Q, and the patient self-assessment tool for cardiac rehabilitation. According to the COSMIN checklist, these tools did not score “excellent” quality in all psychometric properties. In other words, there was no vigorous and valid single scale for the measurement of needs in CAD patients.

The findings showed that while the first article published in 1989 (Phelan et al., 1989) yet the psychometric properties of these publications have not significantly increased to the year of 2021. The reason for this problem might be related to the nature of the concept of need which is a subjective concept and each of patients defined this concept based on attitude, social and cultural background. Concerning the country of publication, the majority of studies were performed in

Canada (De Melo Ghisi et al., 2015; De Melo Ghisi et al., 2016; De Melo Ghisi, Grace et al., 2013; De Melo Ghisi & Oh, 2021; De Melo Ghisi, Oh et al., 2013).

The INCR was developed to evaluate information needs in CR. This scale assesses information need and is culturally adapted to Brazil. This tool includes 11 dimensions. After the validation process of Brazilian version of INCR questionnaire, one dimension of questionnaire including barriers/goal setting was deleted. As the validation process was not performed with adequate sample, the author recommended future research was needed to assess whether the scale was sensitive to change, such as following participation in the education components of CR, or to test implementation of new education materials. Finally, whether the INCR is a valuable and valid tool to identify information needs in individual patients should be further explored (De Melo Ghisi et al., 2014).

The CADE-Q is another questionnaire that was developed by Ghisi et al. (2010), to calculate and describe coronary patients' awareness of CR programs. Most of the psychometric properties of this questionnaire had been previously reported, and it had been adapted to English and Persian language (De Melo Ghisi, Oh et al., 2013; Marofi et al., 2020). Due to the limitations of CADE-Q including the lack of attention to all aspects of CR such as the psychosocial dimension, the author designed and validated CADE-Q II (De Melo Ghisi et al., 2015). This questionnaire was culturally adapted to Brazilian and Chinese patients (Chen et al., 2018; Santos et al., 2019). Because CADE-Q II was long, there was little willingness to fill in the questionnaire so the CADE-Q SV was developed (De Melo Ghisi et al., 2016). The CADE-Q SV was cross-culturally adapted to Brazilian-Portuguese and French-Canadian (De Melo Ghisi et al., 2018; De Melo Ghisi & Oh, 2021). When a new version of a CADE-Q questionnaire was developed, it should not only be updated, and have better theoretical basis, but it must also be shown to be at least as good as the original instrument in terms of validity and reliability. In this context, results of the CADE-Q SV were consistent with those presented in previous versions of this instrument, particularly in relation to criterion validity (correlation to educational level) and all areas being considered internally consisted ($\alpha > 0.70$). The overall mean, as well as the means of the areas were high, reinforcing the idea that CR patients are knowledgeable of the information that is important for them. It may also suggest that individuals with low socioeconomic levels or low literacy are not participating in these programs and strategies to eliminate barriers to access CR should be implemented (De Melo Ghisi et al., 2016).

The patient self-assessment tool for cardiac rehabilitation and CRNAT are other tools for the assessment of CR needs. None of the psychometric properties of these questionnaires had been reported except content validity (Phelan et al., 1989; Smith et al., 2015). The newest questionnaire for need assessment is CNCR-Q that is designed by Sayadi et al. (2021). This questionnaire is developed based on a definition of care needs in patients with CAD undergoing CR according to Islamic culture. Sayadi et al. (2021) added spiritual care needs for CAD patients. This feature has not been mentioned in previous studies. The questionnaire is a tool with 40 items. After conducting face validity qualitatively, all tool items were considered important and were retained for the next steps. After completing the steps for determining the content validity ratio (CVR) and content validity index (CVI) of 40 items, all items were preserved for decision making at a later stage. The results of exploratory factor analysis revealed four factors. Moreover, the factor analysis results in the elimination of three items and the final version of the questionnaire with 37 items remained (Sayadi et al., 2021).

The general quality of the articles examining the measurement properties as rated by the COSMIN list was poor to excellent. Several studies did not state adequate information in the article, thus it was difficult to evaluate their quality. All studies which were reviewed in the study had described internal consistency as reliability, but in several studies, there was no information about other crucial properties. Some tools had a lack of face validity and stability evaluation, so future studies should consider these properties once trying to validate tools. Involved studies did not discuss measurement error, hypothesis testing, and responsiveness, which might be related to the nature of the concept of need, and because these criteria were more applicable for concepts which measured objective changes such as blood pressure in patients. The highest methodological quality was the CADE-Q (De Melo Ghisi et al., 2010), CADE-Q II (De Melo Ghisi et al., 2015) and CNCR-Q (Sayadi et al., 2021) that in one box of COSMIN checklist scored as "Excellent," two boxes "Good," and one box "poor."

5. Implications and limitations

The strength of this review could be attributed to the fact that two investigators individually measured all records in full text, and concurrently with the third and fourth reviewer qualities whom were certified by double or triple evaluation of several studies. The implication of this review includes, according to the aim of this study, to assist nurses in choosing valid tools in the field of CR, to assist nurses in selecting credible tools to more quickly identify the care needs of patients undergoing CR, and to reduce the readmission of heart patients by correctly identifying care needs. It appears that the CADE-Q questionnaire can be recommended to nurses for using in need assessment. However, this review had a limitation that required to be addressed. Our search was limited to studies published in Persian or English. So, studies published in other languages were not involved.

6. Conclusion

This systematic review delivers a summary of 7 tools assessing needs in CAD patients undergoing CR. Although, based on the COSMIN checklist, none of the studies was evaluated excellent in all boxes, the results of this study helped researchers to select the best quality questionnaire among existing questionnaires in this field. In other words, there was no vigorous and valid single scale for the measurement of needs in CAD patients; however, the CADE-Q questionnaire was good based on psychometric properties and a patient self-assessment tool for cardiac rehabilitation was poor based on psychometric properties. This study proposes that future assessment studies on psychometric properties concern standards like the COSMIN checklist to increase the quality of the studies and to enhance the assessment of results. Also, we encourage article's readers to explore how an instrument's psychometric properties might be improved and then re-tested with the result of the tool being of even greater use in clinical practice to decrease the mortality and morbidity of cardiovascular disease.

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Author contribution

NS and EM participated in the definition of intellectual content, literature search and data analysis. JA and KZ were being involved in the manuscript preparation, editing and review.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Appendix 1

Table 1. Data extraction of included studies

Author (year)	Scale	Country	Target popula- tion	Face validity	Content validity	Construct Validity					Reliability	
						Sample size	Factor extraction method (Rotation)	Selection of the number of factors	name of factors	Total variance (%)	Consistency	Stability
De Melo Ghisi et al. (2010)	CADE-Q	Brazil	patient with CAD	patient with CAD(n=30)	19-item4- dimension 4 points Likert expert panel	155	EFA KMO=0.608 Bartlett's Sphericity tests	PCA Eigenvalu es>1 screen plot	f1:General factor f2:Causal factor f3:Risk Factors Factor f4:Other Factors	56.1	Total α :0.068	Overall ICC:0.783
De Melo Ghisi, Oh et al. (2013)	English version of CADE-Q	Canada	patient with CAD	patient with CAD(n=50)	19-item4- dimension 4 points Likert expert panel	200	EFA KMO=0.797Bart lett's Sphericity tests	PCA Eigenvalu es>1	F1:Exercise F2:Risk Factors F3:Diagnosis,treatment and medicines F4:Pathophysiology,signals and symptoms F5: prevention of risk factors	62.23	Total α :0.809	Overall ICC: 0.846 (2- week)
Marofi et al. (2020)	Persian version of CADE-Q	Iran	patient with CAD	patient with CAD(n=10)	19-item3- dimension 4 points Likert expert pane	500	EFA KMO,Bartlett's Sphericity tests,CFA	prom ax rotation screen plot	F1: lifestyle habits& exercise F2: Risk factors F3: Diagnosis and treatment	48.9	Total α :0.844 F1: α = 0.825 F2: α =0.553 F3: α = 0.507	Overall ICC: 0.886 F1: ICC=0.870 F2: ICC=0.782 F3: ICC=0.825
De Melo Ghisi et al. (2015)	CADE-Q II	Canada	patient with CAD	patient with CAD(n=30)	31-item4- dimension 4 points Likert expert pane	307	EFA KMO=0.859Bart lett's Sphericity tests	PCA Eigenvalu es>1	F1: Medical condition F2: Risk factors and exercise F3: nutrition F4: psychosocial risk	62.2	Total α : 0.91 F1: A= 0.71 F2: α = 0.65 F3: α =0.66 F4: α =0.67	NR
Chen et al. (2018)	Chines version of CADE-Q II	China	patient with CAD	patient with CAD(n=40)	28-item 5 dimension 4 points Likert expert panel CVI=0.87	316	CFA	-	F1: medication condition F2: Risk factors F3: Exercise F4: Nutrition F5:Psychological risk	NR	Total α : 0.907 F1: α = 0.692 F2: α = 0.687 F3: α =0.714 F4: α =0.705 F5: α =0.701	NR
Santos et al. (2019)	Brazilian version of CADE-Q II	Brazil	patient with CAD	patient with CAD(n=23)	27-item 5 dimension 4 points Likert expert panel CVI=0.87	307	NR	NR	F1: medical condition F2: Risk factors F3: Exercise F4: Nutrition F5:Psychological risk	NR	Total α : 0.78	Overall ICC:0.77 (2- week)
De Melo Ghisi et al. (2016)	CADE-Q SV	Canada	Patient with CAD	patient with CAD(n=20)	20-item 5 dimension 3 points expert panel	200	NR	NR	F1: medical condition F2: Risk factors F3: Exercise F4: Nutrition F5:Psychological risk	NR	Total α : NR F1: α = 0.94 F2: α = 0.79 F3: α =0.76 F4: α =0.84 F5: α =0.91	NR

Table 1. Continued

Author (year)	Scale	Country	Target popula- tion	Face validity	Content validity	Sample size	Construct Validity				Reliability	
							Factor extraction method (Rotation)	Selection of the number of factors	name of factors	Total variance (%)	Consistency	Stability
De Melo Ghisi et al. (2018)	Brazilian- Portugues e version of CADE- Q SV	Brazil	patient with CAD	patient with CAD(n=21)	20-item 5 dimension 3 points expert panel	200	EFA KMO=0.87 Bartlett's Sphericity tests	PCA Eigenvalues > 1	F1: medical condition F2: Risk factors F3: Exercise F4: Nutrition F5: Psychological risk	59	Total KR-20= 0.7	Overall ICC>0.7
De Melo Ghisi & Oh (2021)	French- Canadian version of CADE-Q SV	Canada	patient with CAD	NR	20-item 5 dimension 3 points expert panel	115	EFA KMO=0.90 Bartlett's Sphericity tests	PCA Eigenvalues > 1	F1: medical condition F2: Risk factors F3: Exercise F4: Nutrition F5: Psychological risk	69.9	Total KR-20= 0.72	NR
De Melo Ghisi, Grace et al. (2013)	INCR	Canada	patient with CAD	patient with CAD(n=34)	55-item 10 dimension 5 points Likert expert panel	203	NR	NR	F1: The heart(physiology,symptoms, surgical treatments),F2:Nutrition F3:Exercise/physical activity,F4:Medication F5:Work/vocational/social F6:Stress/psychological factors F7:General/social concerns F8:Emergency/safety F9:Diagnosis and treatment F10:Risk factors	NR	Total α : NRF1: α = 0.88 F2: α = 0.87 F3: α = 0.88 F4: α = 0.92 F5: α = 0.85 F6: α = 0.87 F7: α = 0.84 F8: α = 0.90 F9: α = 0.86 F10: α = 0.87	NR
De Melo Ghisi et al. (2014)	Portuguese version of INCR	Brazil	patient with CAD	NR	55-item 10 dimension 5 points Likert expert panel	300	NR	NR	F1: The heart(physiology,symptoms, surgical treatments),F2:Nutrition F3:Exercise/physical activity,F4:Medication F5:Work/vocational/social F6:Stress/psychological factors F7:General/social concerns F8:Emergency/safety F9:Diagnosis and treatment F10:Risk factors	NR	Total α : NRF1: α = 0.83 F2: α = 0.84 F3: α = 0.91 F4: α = 0.83 F5: α = 0.71 F6: α = 0.81 F7: A=NR F8: α = 0.80 F9: α = 0.72 F10: α = 0.93	NR
Sayadi et al. (2021)	CNCR-Q	Iran	patient with CAD	patient with CAD(n=10)	37-item 4 dimension 5 points Likert and 4 points expert panel CVI CVR	200	EFA KMO=0.76 Bartlett's Sphericity tests	PCA Eigenvalues > 1 screen plot	F1:physical care needs F2:Spiritual psychological care needs F3:Social family care needs f4: requirment for discharge plane	40.467	Total α : 0.78 F1: α = 0.85 F2: α = 0.83 F3: α = 0.73 F4: α = 0.39	NR

Table 1. Continued

Author (year)	Scale	Country	Target popula- tion	Face validity	Content validity	Construct Validity					Reliability	
						Sample size	Factor extraction method (Rotation)	Selection of the number of factors	name of factors	Total variance (%)	Consistency	Stability
Enguen et al. (2012)	Dutch clinical algorithm for assessing patient needs in Cardiac Rehabilita- tion	Nether- land	patient with CAD	NR	5 dimension expert panel	NR	NR	NR	F1: Physical functioning F2: Psychological functioning F3: Distruption or treat to social functioning F4: Cardiovascular risk profile F5: Lifestyle	NR	NR	NR
Smith et al. (2015)	CRNAT	Australia	patient with CAD	NR	expert panel	NR	NR	NR	NR	NR	NR	NR
Phelan et al. (1989)	A Patient Self- Assessmen t Tool for Cardiac Rehabilita- tion	USA	patient with CAD	NR	38-item 11 dimension	31	NR	NR	F1: Health perception F2: Nutrition F3: Elimination F4: Activity/exercise F5: Perceptual F6: Sleep/rest patients F7: Self- perception/concept F8: Roles/relationship F9: Sexuality F10: Coping/stress F11: Value/belief F12: Discharge planning F13: Teaching needs	NR	NR	NR

Notes: CADE-Q: Coronary Artery Disease Education-Questionnaire, CAD: Coronary Artery Disease, EFA: Exploratory Factor Analysis, KMO: Kaiser-Meyer-Olkin, PCA: Principal Component Analysis, ICC: Intra- Class Correlation, CFA: Confirmatory Factor Analysis, NR: Not Reported, CADE-Q SV Coronary Artery Disease Education-Questionnaire Short Version, INCR: Information Needs in Cardiac Rehabilitation, CNCR-Q: Care Needs in Cardiac Rehabilitation Questionnaire, CRNAT: Cardiac Rehabilitation Needs Assessment Tool, α : alpha, KR: Kuder Richardson

Appendix 2

Table 2. Scoring system of internal consistency (Box A)

Box A. Internal consistency	Excellent	Good	Fair	Poor
1 Does the scale consist of effect indicators, i.e. is it based on a reflective model? Design requirements				
2 Was the percentage of missing items given?	Percentage of missing items described	Percentage of missing items NOT described		
3 Was there a description of how missing items were handled	Described how missing items were handled	Not described but it can be deduced how missing items were handled	Not clear how missing items were handled	
4 Was the sample size included in the internal consistency analysis adequate?	Adequate sample size (≥ 100)	Good sample size (50-99)	Moderate sample size (30-49)	Small sample size (<30)
5 Was the unidimensionality of the scale checked? i.e. was factor analysis or IRT model applied?	Factor analysis performed in the study population	Authors refer to another study in which factor analysis was performed in a similar study population	Authors refer to another study in which factor analysis was performed, but not in a similar study population	Factor analysis NOT performed and no reference to another stud
6 Was the sample size included in the unidimensionality analysis adequate?	7* #items and ≥ 100	5* #items and ≥ 100 OR 6-7* #items but <100	5* #items but <100	<5#items
7 Was an internal consistency statistic calculated for each (unidimensional) (sub)scale separately?	Internal consistency statistic calculated for each subscale separately			Internal consistency statistic NOT calculated for each subscale separately
8 Were there any important flaws in the design or methods of the study	No other important methodological flaws in the design or execution of the study		Other minor methodological flaws in the design or execution of the study	Other important methodological flaws in the design or execution of the study
Statistical methods				
9 for Classical Test Theory (CTT), continuous scores: Was Cronbach's alpha calculated?	Cronbach's alpha calculated		Only item-total correlations calculated	No Cronbach's alpha and no item-total correlations calculated
10 for CTT, dichotomous scores: Was Cronbach's alpha or KR-20 calculated?	Cronbach's alpha or KR-20 calculated		Only item-total correlations calculated	No Cronbach's alpha or KR-20 and no itemtotal correlations calculated
11 for IRT: Was a goodness of fit statistic at a global level calculated? E.g. χ^2 , reliability coefficient of estimated latent trait value (index of (subject or item) separation)	Goodness of fit statistic at a global level calculated			Goodness of fit statistic at a global level NOT calculated

Table 3. Scoring system of reliability (Box B)

Box B. Reliability: relative measures (including test-retest reliability, inter-rater reliability and intra-rater reliability)	Excellent	Good	Fair	Poor
Design requirements	Percentage of missing items described	Percentage of missing items NOT described		
1 Was the percentage of missing items given?				
2 Was there a description of how missing items were handled?	Described how missing items were handled	Not described but it can be deduced how missing items were handled	Not clear how missing items were handled	
3 Was the sample size included in the analysis adequate?	Adequate sample size (≥ 100)	Good sample size (50-99)	Moderate sample size (30-49)	Small sample size (< 30)
4 Were at least two measurements available?	At least two measurements			Only one measurement
5 Were the administrations independent?	Independent measurements	Assumable that the measurements were independent	Doubtful whether the measurements were independent	measurements NOT independent
6 Was the time interval stated?	Time interval stated		Time interval NOT stated	
7 Were patients stable in the interim period on the construct to be measured?	Patients were stable (evidence provided)	Assumable that patients were stable	Unclear if patients were stable	Patients were NOT stable
8 Was the time interval appropriate?	Time interval appropriate		Doubtful whether time interval was appropriate	Time interval NOT appropriate
9 Were the test conditions similar for both measurements? e.g. type of administration, environment, instructions	Test conditions were similar (evidence provided)	Assumable that test conditions were similar	Unclear if test conditions were similar	Test conditions were NOT similar
10 Were there any important flaws in the design or methods of the study?	No other important methodological flaws in the design or execution of the study		Other minor methodological flaws in the design or execution of the study	Other important methodological flaws in the design or execution of the study
Statistical methods	ICC calculated and model or formula of the ICC is described	ICC calculated but model or formula of the ICC not described or not optimal. Pearson or Spearman correlation coefficient calculated with evidence provided that no systematic change has occurred	Pearson or Spearman correlation coefficient calculated WITHOUT evidence provided that no systematic change has occurred or WITH evidence that systematic change has occurred	No ICC or Pearson or Spearman correlations calculated
11 for continuous scores: Was an intraclass correlation coefficient (ICC) calculated?				
12 for dichotomous/nominal/ordinal scores: Was kappa calculated?	Kappa calculated			Only percentage agreement calculated
13 for ordinal scores: Was a weighted kappa calculated?	Weighted Kappa calculated		Unweighted Kappa calculated	Only percentage agreement calculated
14 for ordinal scores: Was the weighting scheme described? e.g. linear, quadratic	Weighting scheme described	Weighting scheme NOT described		

Table 4. Scoring system of content validity (Box D)

Box D. Content validity (including face validity)	Excellent	Good	Fair	Poor
General requirements	Assessed if all items refer to relevant aspects of the construct to be measured		Aspects of the construct to be measured poorly described AND this was not taken into consideration	NOT assessed if all items refer to relevant aspects of the construct to be measured
1 Was there an assessment of whether all items refer to relevant aspects of the construct to be measured?				
2 Was there an assessment of whether all items are relevant for the study population? (e.g. age, gender, disease characteristics, country, setting)	Assessed if all items are relevant for the study population in adequate sample size (≥ 10)	Assessed if all items are relevant for the study population in moderate sample size (5-9)	Assessed if all items are relevant for the study population in small sample size (NOT assessed if all items are relevant for the study population OR target population not involved
3 Was there an assessment of whether all items are relevant for the purpose of the measurement instrument? (discriminative, evaluative, and/or predictive)	Assessed if all items are relevant for the purpose of the application	Purpose of the instrument was not described but assumed	NOT assessed if all items are relevant for the purpose of the application	
4 Was there an assessment of whether all items together comprehensively reflect the construct to be measured?	Assessed if all items together comprehensively reflect the construct to be measured		No theoretical foundation of the construct and this was not taken into consideration	NOT assessed if all items together comprehensively reflect the construct to be measured
5 Were there any important flaws in the design or methods of the study?	No other important methodological flaws in the design or execution of the study		Other minor methodological flaws in the design or execution of the study	Other important methodological flaws in the design or execution of the study

Table 5. Scoring system of structural validity (Box E)

Box E. Structural validity	Excellent	Good	Fair	Poor
1 Does the scale consist of effect indicators, i.e. is it based on a reflective model?				
Design requirements 2 Was the percentage of missing items given?	Percentage of missing items described	Percentage of missing items NOT described		
3 Was there a description of how missing items were handled?	Described how missing items were handled	Not described but it can be deduced how missing items were handled	Not clear how missing items were handled	
4 Was the sample size included in the analysis adequate?	7* #items and ≥ 100	5* #items and ≥ 100 OR 5-7* #items but < 100	5* #items but < 100	5* #items
5 Were there any important flaws in the design or methods of the study?	No other important methodological flaws in the design or execution of the study		Other minor methodological flaws in the design or execution of the study (e.g. rotation method not described)	Other important methodological flaws in the design or execution of the study (e.g. inappropriate rotation method)
Statistical methods				
6 for CTT: Was exploratory or confirmatory factor analysis performed?	Exploratory or confirmatory factor analysis performed and type of factor analysis appropriate in view of existing information	Exploratory factor analysis performed while confirmatory would have been more appropriate		No exploratory or confirmatory factor analysis performed
7 for IRT: Were IRT tests for determining the (uni-) dimensionality of the items performed?	RT test for determining (uni)dimensionality performed			IRT test for determining (uni)dimensionality NOT performed

Table 6. Scoring system of cross-cultural validity (Box G)

Box G. Cross-cultural validity	Excellent	Good	Fair	Poor
Design requirements	Percentage of missing items described	Percentage of missing items NOT described		
1 Was the percentage of missing items given?				
2 Was there a description of how missing items were handled?	Described how missing items were handled	Not described but it can be deduced how missing items were handled.	Not clear how missing items were handled.	
3 Was the sample size included in the analysis adequate?	CTT: 7* #items and ≥ 100 IRT: ≥ 200 per group	CTT: 5* #items and ≥ 100 OR 5-7* #items but < 100 IRT: > 200 IN 1 group and 100-199 in 1 group	CTT: 5* #items but < 100 IRT: 100-199 per group	CTT: < 5 * #items IRT: (< 100 in 1 or both group)
4 Were both the original language in which the HR-PRO instrument was developed, and the language in which the HR-PRO instrument was translated described?	Both source language and target language described			Source language NOT known
5 Was the expertise of the people involved in the translation process adequately described? e.g. expertise in the disease(s) involved, expertise in the construct to be measured, expertise in both languages	Expertise of the translators described with respect to disease, construct, and language	Expertise of the translators with respect to disease or construct poor or not described	Expertise of the translators with respect to language not described	
6 Did the translators work independently from each other?	Translators worked independent	Assumable that the translators worked independent	Unclear whether translators worked independent	Translators worked NOT independent
7 Were items translated forward and backward?	Multiple forward and multiple backward translations	Multiple forward translations but one backward translation	One forward and one backward translation	Only a forward translation
8 Was there an adequate description of how differences between the original and translated versions were resolved?	Adequate description of how differences between translators were resolved.	Poorly or NOT described how differences between translators were resolved.		
9 Was the translation reviewed by a committee (e.g. original developers)?	Translation reviewed by a committee (involving other people than the translators, e.g. the original developers)	Translation NOT reviewed by (such) a committee		
10 Was the HR-PRO instrument pre-tested (e.g. cognitive interviews) to check interpretation, cultural relevance of the translation, and ease of comprehension	Translated instrument pretested in the target population	Translated instrument pretested, but unclear if this was done in the target population	Translated instrument pretested, but NOT in the target population	Translated instrument NOT pre-tested
11 Was the sample used in the pre-test adequately described?	Sample used in the pre-test adequately described		Sample used in the pre-test NOT (adequately) described	
12 Were the samples similar for all characteristics except language and/or cultural background?	Shown that samples were similar for all characteristics except language /culture	Stated (but not shown) that samples were similar for all characteristics except language /culture	Unclear whether samples were similar for all characteristics except language /culture	Samples were NOT similar for all characteristics except language /culture

Table 6. Continued

Box G. Cross-cultural validity	Excellent	Good	Fair	Poor
13 Were there any important flaws in the design or methods of the study?	No other important methodological flaws in the design or execution of the study		Other minor methodological flaws in the design or execution of the study	Other important methodological flaws in the design or execution of the study
Statistical methods 14 for CTT: Was confirmatory factor analysis performed?	Multiple-group confirmatory factor analysis performed			Multiple-group confirmatory factor analysis NOT performed
15 for IRT: Was differential item function (DIF) between language groups assessed?	DIF between language groups assessed.			DIF between language groups NOT assessed

Table 7. Scoring System of Criterion Validity (Box H)

Box H. Criterion validity	Excellent	Good	Fair	Poor
Design requirements 1 Was the percentage of missing items given? 2 Was there a description of how missing items were handled?	Percentage of missing items described Described how missing items were handled	Percentage of missing items NOT described Not described but it can be deduced how missing items were handled	Not clear how missing items were handled	
3 Was the sample size included in the analysis adequate? 4 Can the criterion used or employed be considered as a reasonable 'gold standard'?	Adequate sample size (≥ 100) Criterion used can be considered an adequate 'gold standard' (evidence provided)	Good sample size (50-99) No evidence provided, but assumable that the criterion used can be considered an adequate 'gold standard'	Moderate sample size (30-49) Unclear whether the criterion used can be considered an adequate 'gold standard'	Small sample size (< 30) Criterion used can NOT be considered an adequate 'gold standard'
5 Were there any important flaws in the design or methods of the study?	No other important methodological flaws in the design or execution of the study		Other minor methodological flaws in the design or execution of the study	Other important methodological flaws in the design or execution of the study
Statistical methods 6 for continuous scores: Were correlations, or the area under the receiver operating curve calculated? 7 for dichotomous scores: Were sensitivity and specificity determined?	Correlations or AUC calculated Sensitivity and specificity calculated			Correlations or AUC NOT calculated Sensitivity and specificity NOT calculated