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JKP welcomes studies from various study designs (original research, review article, case study, editorial, perspective, and letter to editor) to accommodate nursing research with rigorous methods for international readers. This journal has been publishing peer-review journals since 2013. This journal offers benefits for authors (1) A nursing journal with a high reputation; (2) indexed in major databases such as Science and Technology Index (SINTA) rank 2, and Directory of Open Access Journal (DOAJ); (3) and rapid decision for sustainability editorial process.

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Future trends in instrument development in nursing research: From traditional psychometrics to cross-cultural and digital measurement approaches

Tram Thi Bich Nguyen^{1,2}, Chung-Ying Lin^{3,4,5,6*}

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Abstract

Measurement instruments are fundamental to nursing research, as they are a cost-effective method for nursing personnel to quickly understand various health and behaviors, such as quality of life and functional health outcomes. Although many instruments have been developed using traditional psychometric approaches, conventional measurement practices may need to be reevaluated. Specifically, emerging challenges, including cultural diversity in global research, multidimensional health constructs, and the rapid development of digital health technologies, have revealed limitations in conventional measurement practices. This editorial discusses key issues in instrument development within nursing research and highlights future directions for methodological advancement. For example, future efforts should emphasize rigorous construct validation, cross-cultural adaptation, measurement invariance testing, and the integration of digital and real-time measurement tools. Advancing these approaches will enhance the validity, applicability, and global relevance of measurement instruments, thereby strengthening the evidence base that informs nursing practice, education, and health policy.

Keywords: cross-cultural validation; digital health; instrument development; nursing research; psychometrics.

Measurement is a cornerstone of nursing research, providing the means to capture complex, multidimensional phenomena, such as symptom experiences, health-related quality of life, functional ability, psychological well-being, and patient engagement, that cannot be directly observed (Omolade et al., 2025). Symptom science research, in particular, emphasizes understanding holistic mechanisms, ensuring accurate assessment, and promoting patient-centered management, highlighting the essential role of reliable and valid measurement tools in advancing nursing knowledge. Over the past decades, nursing research has made significant strides in developing and validating instruments to assess clinical symptoms, psychosocial constructs, patient experiences, and health behaviors across diverse populations. Traditional psychometric approaches, including internal consistency, exploratory and confirmatory factor analysis, and basic construct validity testing, have contributed to methodological rigor and produced numerous widely used scales (López-Pina & Veas, 2024).

Nonetheless, the evolving landscape of nursing research presents new challenges for measurement science. Studies increasingly involve global

and cross-cultural populations, interdisciplinary collaborations, and complex theoretical models, while digital health technologies, including mobile applications, wearable sensors, and remote monitoring systems, are reshaping the ways health data are collected and analyzed. These developments underscore the need to move beyond conventional approaches and adopt more sophisticated, adaptable, and technologically informed measurement strategies. The present editorial reviews key methodological issues in current instrument development practices and proposes future directions for nursing research, with particular emphasis on three emerging areas: advanced psychometric methods, cross-cultural validation, and digital measurement approaches.

Current Issues in Instrument Development in Nursing Research

Despite substantial progress in measurement science, several challenges remain in the development and application of research instruments in nursing.

Overreliance on Classical Psychometric Indicators

Many nursing studies rely heavily on a limited set of psychometric indicators, particularly internal consistency measured by Cronbach's alpha, while other reliability indices (e.g., McDonald's omega and test-retest reliability) are rarely reported (Maric et al., 2023). Although important, reliance on alpha alone is insufficient to ensure that an instrument accurately captures the intended construct. Similarly, exploratory and confirmatory factor analyses are widely used to assess structural validity, yet they are often applied with no strong theoretical foundations, inadequate sample sizes, or improper reporting standards (Alavi et al., 2023). As a result, these instruments demonstrate acceptable statistical properties but do not have rigorous evidence to support their use because of a lack of conceptual clarity or theoretical coherence. This overemphasis on a narrow range of psychometric evidence can constrain comprehensive validation and contribute to the proliferation of instruments with overlapping constructs or unclear boundaries, reflecting broader ethical concerns in scale development, including redundancy and inefficient use of research resources (Ayala et al., 2026).

Fragmentation of Measurement Constructs

Another challenge in nursing research is the fragmentation of measurement constructs, as inherently multidimensional and dynamic phenomena (e.g., symptom clusters, self-management behaviors, and health-related quality of life), are often assessed using isolated scales that capture only limited aspects of the construct. This fragmented approach can hinder a comprehensive

understanding of complex relationships among health variables. As nursing research increasingly adopts sophisticated analytical methods, including structural equation modeling (SEM), mediation analysis, and multilevel modeling, the need for more comprehensive and theoretically grounded measurement instruments becomes evident (Henly, 2015).

Limited Cross-Cultural Validation

Nursing research is increasingly global, encompassing diverse cultural, linguistic, and healthcare contexts. However, many measurement instruments were originally developed in Western populations and may not adequately capture health experiences in cultures other than Western people. Notably, most evidence-based practice instruments have been validated in English-speaking countries, with fewer than 20% translated into other languages, limiting their global applicability and posing risks when applied to populations for which they have not been properly validated (Halm, 2024). Although translation and cultural adaptation are commonly undertaken, these efforts often emphasize linguistic conversion rather than comprehensive cross-cultural validation (Nudelman et al., 2024). Without rigorous assessment of cultural equivalence and measurement invariance, such instruments may yield biased or inaccurate results across different populations.

Emerging Trends in Instrument Development

In response to these challenges, several methodological trends are shaping the future of instrument development in nursing research.

Advanced Psychometric Approaches

Advances in psychometric theory have introduced more sophisticated methods for evaluating measurement properties, enabling a deeper and more precise understanding of instrument performance. Item response theory (IRT), for example, allows researchers to examine item-level characteristics, such as difficulty and discrimination, with parameters estimated independently of the sample, thereby enhancing generalizability (Gyamfi & Acquaye, 2023). In addition to IRT, factor analytic approaches, including exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), remain fundamental for examining the underlying structure of instruments and the relationships between latent constructs and observed variables while accounting for measurement error. More advanced extensions, such as extended SEM and bifactor CFA, further enable the evaluation of multidimensional constructs and complex mechanisms, including mediation and moderation, within theoretically driven models.

More recently, network analysis has emerged as a complementary approach to traditional latent variable models, reconceptualizing psychological and

health-related constructs as systems of interacting components rather than reflections of underlying latent factors (Cai et al., 2020). This perspective enables the examination of direct relationships among symptoms or behaviors, providing novel insights into the structure and dynamics of complex health phenomena. Another critical advancement is the assessment of measurement invariance (or differential item functioning; DIF), which determines whether an instrument measures the same construct consistently across different groups or time points (Leitgöb et al., 2023). Establishing invariance is essential for ensuring valid comparisons across populations, especially in increasingly diverse and cross-cultural research contexts. Together, these advanced psychometric approaches provide a more robust and comprehensive framework for instrument development, supporting greater precision, validity, and theoretical alignment in nursing research.

Cross-Cultural Adaptation and Global Measurement

The globalization of nursing research has intensified the need for culturally sensitive measurement instruments, as studies increasingly involve diverse populations across varying cultural and healthcare contexts. In this context, cross-cultural adaptation extends far beyond simple translation, requiring careful consideration of conceptual equivalence, semantic accuracy, and cultural relevance to ensure that instruments meaningfully capture the intended constructs across settings. Established guidelines recommend systematic and rigorous procedures for cross-cultural adaptation, including forward and back translation, expert committee review, synthesis, cognitive interviewing, and pre-testing, with the framework proposed by Beaton et al. remaining a key reference in the field (Beaton et al., 2000). In addition to these qualitative processes, statistical techniques such as multi-group confirmatory factor analysis are widely used to evaluate measurement invariance across cultural groups, ensuring that instruments function equivalently and support valid cross-cultural comparisons.

Developing culturally robust instruments not only enhances the validity and generalizability of research findings but also promotes more inclusive and equitable health research. As global collaborations continue to expand, the importance of culturally adaptable and methodologically rigorous measurement tools will become increasingly central to advancing nursing science.

Integration of Digital and Real-Time Measurement

Digital health technologies are fundamentally transforming how health-related data are collected and analyzed through the integration of information technology and healthcare systems (Pawar et al., 2024). Mobile devices, wearable sensors, and digital health platforms now enable the collection of real-time or near real-time data on individuals'

physiological signals, behaviors, and environmental contexts, offering new opportunities for more dynamic and precise measurement in nursing research. One prominent approach is ecological momentary assessment (EMA), which involves the repeated collection of real-time data on participants' experiences within their natural environments, often using smartphone-based technologies (Businelle et al., 2024). Compared with traditional retrospective self-report measures, EMA captures fluctuations in symptoms, mood, and behaviors as they occur, thereby enhancing ecological validity and reducing recall bias. This approach is particularly valuable for understanding dynamic health processes and patient experiences in everyday contexts.

Similarly, wearable devices have emerged as powerful tools for continuous health monitoring, capable of tracking physical activity, sleep patterns, heart rate, movement, and other physiological indicators in real time (Sieniawska et al., 2024). The integration of these objective data with patient-reported outcomes offers a more comprehensive and multidimensional understanding of health processes, aligning with the holistic perspective central to nursing science. Despite these advantages, the integration of digital measurement approaches presents both opportunities and challenges for nursing researchers. While digital tools can enhance data richness, temporal precision, and contextual relevance, they also require careful consideration of data privacy, technological accessibility, and measurement validity. Addressing these challenges is essential to ensure that digital innovations contribute meaningfully to rigorous and ethical nursing research.

Implications for Nursing Research

Advancing instrument development in nursing research requires a shift toward more rigorous, comprehensive, and innovative measurement practices. To support this transition, several strategic directions should be considered. First, researchers should prioritize comprehensive construct validation rather than relying primarily on internal consistency or basic factor analytic techniques. The use of advanced psychometric approaches, such as IRT, extended SEM, bifactor CFA, and network analysis, can strengthen both the theoretical grounding and statistical robustness of measurement instruments. Second, cross-cultural considerations should be integrated from the earliest stages of instrument development to ensure validity and applicability across diverse populations. Engaging in collaborative international research can provide valuable perspectives that enhance the cultural relevance and generalizability of measurement tools.

Third, nursing researchers should actively explore the integration of digital health technologies into measurement frameworks. Combining patient-reported outcomes with digital health data offers a

more comprehensive and dynamic representation of patients' experiences and health trajectories, aligning with the increasingly complex nature of healthcare. Finally, interdisciplinary collaboration with experts in psychometrics, data science, and digital health is essential for developing innovative and methodologically sound measurement strategies. Such collaboration will enable nursing research to keep pace with evolving scientific and technological advancements while ensuring the continued rigor and relevance of measurement practices.

Conclusion

Measurement instruments are fundamental to advancing nursing science, providing the foundation for understanding complex health phenomena and informing evidence-based practice. As nursing research increasingly operates within global, interdisciplinary, and technology-driven contexts, traditional approaches to instrument development must evolve to address emerging methodological and practical challenges. Future efforts should emphasize rigorous psychometric evaluation, cultural adaptability, and the integration of digital measurement technologies to enhance the validity, precision, and relevance of research instruments. Through continued innovation in measurement science, nursing researchers can more accurately capture the complexity of human health and strengthen the evidence base that supports high-quality, patient-centered care, education, and health policy.

Declaration of Interest

None.

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References

- Alavi, M., Biros, E., & Cleary, M. (2023). Notes to factor analysis techniques for construct validity. *Canadian Journal of Nursing Research*, 56, 164-170. <https://doi.org/10.1177/08445621231204296>
- Ayala, R., Finkler, M., & Pariseau-Legault, P. (2026). Tooling up nursing research: Ethical tensions within psychometric scale development. *Nursing Inquiry*, 33(1), e70065. <https://doi.org/10.1111/nin.70065>
- Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*, 25(24), 3186-3191.
- Businelle, M. S., Hébert, E. T., Shi, D., Benson, L., Kezbers, K. M., Tonkin, S., Piper, M. E., & Qian, T. (2024). Investigating best practices for ecological momentary assessment: Nationwide factorial experiment. *Journal of Medical Internet Research*, 26, e50275. <https://doi.org/10.2196/50275>
- Cai, Y., Dong, S., Yuan, S., & Hu, C.-P. (2020). Network analysis and its applications in psychology. *Advances in Psychological Science*, 28(1), 178. <https://doi.org/10.3724/SP.J.1042.2020.00178>
- Gyamfi, A., & Acquaye, R. (2023). Parameters and models of item response theory (IRT): A review of literature. *Acta Educationis Generalis*, 13(3), 68-78. <https://doi.org/10.2478/atd-2023-0022>
- Halm, M. A. (2024). A compendium of evidence-based practice instruments for nursing education, practice and research. *Worldviews on Evidence-Based Nursing*. <https://doi.org/10.1111/wvn.12703>
- Henly, S. J. (2015). Routledge international handbook of advanced quantitative methods in nursing research.
- Leitgöb, H., Seddig, D., Asparouhov, T., Behr, D., Davidov, E., DeRoover, K., Jak, S., Meitinger, K., Menold, N., & Muthén, B. (2023). Measurement invariance in the social sciences: Historical development, methodological challenges, state of the art, and future perspectives. *Social Science Research*, 110, 102805. <https://doi.org/10.1016/j.ssresearch.2022.102805>
- López-Pina, J.-A., & Veas, A. (2024). Validation of psychometric instruments with classical test theory in social and health sciences: A practical guide. *Anales de Psicología*, 40(1), 163-170. <https://doi.org/10.6018/analesps.583991>
- Maric, D., Fore, G. A., Nyarko, S. C., & Varma-Nelson, P. (2023). Measurement in STEM education research: A systematic literature review of trends in the psychometric evidence of scales. *International Journal of STEM Education*, 10(1), 39. <https://doi.org/10.1186/s40594-023-00430-x>
- Nudelman, C. J., Bottalico, P., van Mersbergen, M., & Nanjundeswaran, C. (2024). Toward enhanced voice-related self-reports: Translation, cross-cultural adaptation, and validity. *Journal of Voice*. <https://doi.org/10.1016/j.jvoice.2024.03.016>
- Omolade, O. K., Stephenson, J., Simkhada, P., & Keely, A. (2025). Is this a good questionnaire? Dimensionality and category functioning of questionnaires used in nursing research. *Nurse Researcher*, 33(2). <https://doi.org/10.7748/nr.2022.e1842>
- Pawar, D., Gujarathi, S., Gupta, R., Khan, A., & Tiwari, A. (2024). A detail review on digital health technologies. *International Journal for Research in Applied Science and Engineering Technology*, 12(2), 621-630. <https://doi.org/10.1016/j.ijraset.2024.02.016>

[org/10.22214/ijraset.2024.58371](https://doi.org/10.22214/ijraset.2024.58371)

Sieniawska, J., Proszowska, P., Madoń, M., Kotowicz, Z., Orzeł, A., Pich-Czekierda, A., & Sieniawska, D. (2024). Measuring health:

Wearables in fitness tracking, stress relief, and sleep management. *Journal of Education, Health and Sport*, 67, 50673-50673. <https://doi.org/10.12775/JEHS.2024.67.003>

Analyzing the relationships between nursing students' academic performance, academic procrastination, burnout, and GPA

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Abstract

Background: The current learning system, which employs hybrid learning methods, requires students to adapt and manage their time effectively. Failure to do so may increase the risk of experiencing academic burnout and procrastination.

Purpose: This study aims to explore the relationship between academic burnout, academic procrastination, self-regulated learning, academic performance, and Grade Point Average (GPA) among students.

Methods: A cross-sectional study was conducted with 310 nursing students selected through purposive sampling. The variables examined were academic burnout, academic procrastination, self-regulated learning, academic performance, and GPA. The instruments used included the Self-Regulated Learning Scales, the Maslach Burnout Inventory Student Survey, the Active Procrastination Scale, and the Academic Performance Scale. Statistical analysis was performed using Structural Equation Modeling (SEM) with Partial Least Squares (PLS).

Results: The confirmatory factor analysis of the scales indicated that SRMR=0.125, NFI=0.620, and RMS theta=0.190, suggesting that the model does not meet the criteria for a good fit. The R-square value was 0.481, indicating that self-regulated learning, academic procrastination, and burnout collectively influence academic performance.

Conclusion: These findings contribute to the literature by highlighting the role of self-regulated learning and procrastination in academic outcomes while calling into question the reliability of GPA as a sole indicator of academic success.

Keywords: academic; burnout; procrastination; self-regulated learning; students

Introduction

Academic performance has garnered significant attention, particularly in higher education institutions that face growing challenges due to shifting learning environments. Since the COVID-19 pandemic, learning methods that were initially conducted offline transitioned to online. After the pandemic ended, these methods evolved into hybrid learning approaches. The hybrid learning, which combines online and offline methods, has introduced new complexities for students. They are expected to manage their time, maintain motivation, and regulate their learning behaviors across different platforms. Among these factors, academic procrastination, academic burnout, and self-regulated learning are particularly significant as they directly impact students' academic experiences and outcomes. (Ragusa et al., 2023)

Academic procrastination involves the voluntary delay of academic tasks despite knowing that such delays could lead to negative consequences

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(Salguero-Pazos & Reyes-de-Cózar, 2023) a research indicates that procrastination disrupts students' ability to manage their time effectively, leading to missed deadlines and reduced academic performance (Rad et al., 2025). Academic burnout, characterized by emotional exhaustion, cynicism, and a sense of reduced personal accomplishment (Liu et al., 2023). Self-regulated learning involves students' ability to effectively plan, monitor, and evaluate their learning processes (Raković et al., 2022). It is a well-documented predictor of academic success, with self-regulated learners typically achieving higher academic performance due to better time and resource management (Panadero, 2017). Despite the strong evidence linking self-regulated learning to academic achievement, there is a gap in understanding how it interacts with procrastination and burnout to influence GPA.

The influence of academic procrastination, burnout, and self-regulated learning on academic performance and GPA (Grade Average Point) is a critical area of research, given its implications for student success and well-being. Understanding these factors is essential for developing effective educational strategies and interventions. This research topic is significant because it addresses the complex interplay between students' psychological states and their academic outcomes, which can inform policies and practices to enhance educational experiences and performance.

Previous research highlights the reciprocal relationship between GPA and burnout, indicating that high academic performance can lead to increased burnout, particularly among high-achieving students (Puah et al., 2024). Additionally, studies have shown that self-regulated learning significantly influences academic procrastination, suggesting that effective time management and motivation are essential for academic success (Goyal et al., 2024). Another studied studies have explored the reciprocal relationship between burnout and GPA, highlighting the role of grit and passion as moderating factors (Puah et al., 2024). However, the dynamic between self-regulated learning and procrastination remains underexplored, particularly in how self-regulation can mitigate procrastination's negative effects (Astuti, 2024).

This research adopts an integrative theoretical framework combining Self-Regulated Learning Theory (Zimmerman, 2002), Maslach's framework of academic burnout (Maslach & Jackson, 1981) and the Temporal Motivation Theory (Steel & König, 2006) to examine the combined effects of academic procrastination, burnout, and self-regulated learning on academic performance and GPA.

Materials and Methods

Design

This is an analytical study with a cross-sectional design, conducted from April to May 2024.

Sample

The sample consisted of 310 students aged between 19 and 22 years, taken by purposive sampling. The participants were nursing students from the Faculty of Nursing and Midwifery at Private University Surabaya. The inclusion criteria are all nursing students in second and third year. The G*Power program was utilized to determine the sample size and assess the statistical power of the study. For all calculations, a significance level (α) of 0.05 and a statistical power ($1 - \beta$) of 0.95 were employed.

Variable and Measurements

Self-Regulated Learning

The Self-Regulated Learning questionnaire used the Zimmerman version, which was modified by Fauziah (Fauziah et al., 2018). It consists of 47 questions using a Likert scale ranging from 1 to 4. For favourable items, 1 point represents "strongly agree," 2 points for "agree," 3 points for "disagree," and 4 points for "strongly disagree." Conversely, for unfavourable items, 1 point represents "strongly disagree," 2 points for "disagree," 3 points for "agree," and 4 points for "strongly agree." Favourable items include questions 1, 2, 7, 8, 9, 11, 13, 15, 18, 19, 21, 23, 25, 26, 29, 30, 33, 35, 36, 37, 40, 41, 44, and 45, while unfavourable items are questions 3, 4, 5, 6, 10, 12, 14, 16, 17, 20, 22, 24, 27, 28, 31, 32, 34, 38, 39, 42, 43, 46, and 47. The questionnaire assesses three domains: academic cognition, academic motivation, and academic behaviour. The reliability test yielded a Cronbach's alpha of 0.923.

Academic Burnout

Academic burnout was measured using the Maslach Burnout Inventory Student Survey (MBI-SS) (Schaufeli et al., 2002), which consists of 15 questions using a Likert scale. For favourable items, 1 point represents "strongly agree," 2 points for "agree," 3 points for "disagree," and 4 points for "strongly disagree." For unfavourable items, the scoring is reversed: 1 point represents "strongly disagree," and so on. Favourable items are numbered 1-9, while unfavourable items are 10-15. The questionnaire is divided into three domains: emotional exhaustion, depersonalization, and personal achievement.

Academic Procrastination

The Academic Procrastination questionnaire used the Active Procrastination Scale (APS) developed by (Chun Chu & Choi, 2005), later modified by (Choi & Moran, 2009), with the Indonesian version validated and tested for reliability by Purwanto (Purwanto & Natalya, 2019). The questionnaire consists of 16 items, with four dimensions: outcome satisfaction, preference for pressure, intentional decision to procrastinate, and ability to meet deadlines. Each dimension comprises four items, and responses are measured on a seven-point Likert scale ranging from 1 ("totally disagree") to 7 ("totally agree").

Table 1. Characteristic of respondents

Variable	N	%
Gender		
Male	27	8.7
Female	283	91.3
Age		
19 years	68	21.9
20 years	70	22.6
21 years	160	51.6
22 years	12	3.9

Table 2. Model fit

	Saturated Model	Estimated Model
SRMR	0.125	0.126
d_ULS	2.969	3.014
d_G	0.574	0.577
Chi-Square	1054.018	1059.264
NFI	0.620	0.619

Table 3. Hypotesis test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Academic Performance -> GPA	0.051	0.052	0.061	0.839	0.402
Academic Procrastination -> Academic Performance	-0.632	-0.636	0.043	14.597	0.000
Burn-out Academic -> Academic Performance	0.051	0.041	0.039	1.308	0.191
Self-Regulated Learning -> Academic Performance	0.508	0.508	0.044	11.493	0.000

For unfavourable items, the scoring is reversed. Unfavourable items include questions 9, 10, 11, and 12.

Academic Performance

The Academic Performance questionnaire was adapted from the instrument developed by Carson Birchmeier, Emily Grattan, Sarah Hornbacher, and Christopher Gregory of Saginaw Valley State University. It consists of 8 items, with responses measured on a five-point Likert scale, where 5 represents "strongly agree" and 1 represents "strongly disagree."

Grade Point Average (GPA)

The maximum GPA is 4. The cumulative GPA of the students was categorized as follows: 3.5-4.0 as excellent, 3.0-3.5 as very good, 2.5-3.0 as fairly good, 2.0-2.5 as poor, and 0.0-2.0 as fail.

Data collection

The research involves collecting primary data

through a self-administered questionnaire. To obtain the necessary data, a request letter was sent to the College Dean for permission to conduct the study. Following approval and ethical clearance, the researchers began gathering data from students. The data collection was carried out using Google Forms, and there was no face-to-face interaction during this process. On the first page of the Google Form, there is a description of the research objectives and the identities of the researchers involved. This is followed by an informed consent section for the respondents. Those who agree to participate can proceed directly to respond to the questionnaire, while those who do not wish to participate may exit the Google Form immediately.

Data analysis

Statistical analysis was conducted using Structural Equation Modeling-Partial Least Square (SEM-PLS). Descriptive statistics were employed to describe the participants' age and gender.

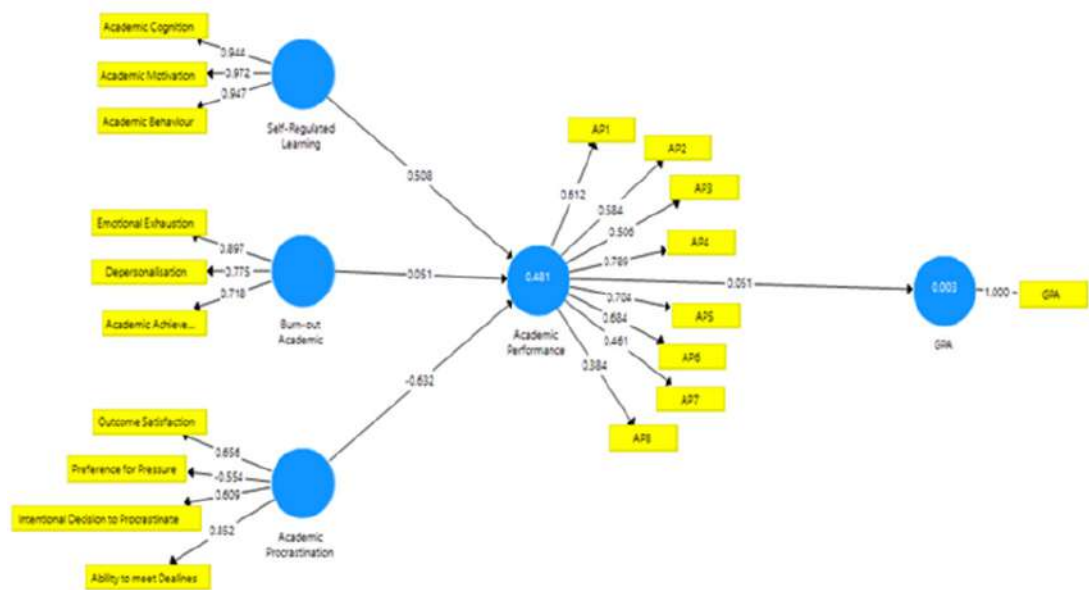


Figure 1. Loading factor analysis

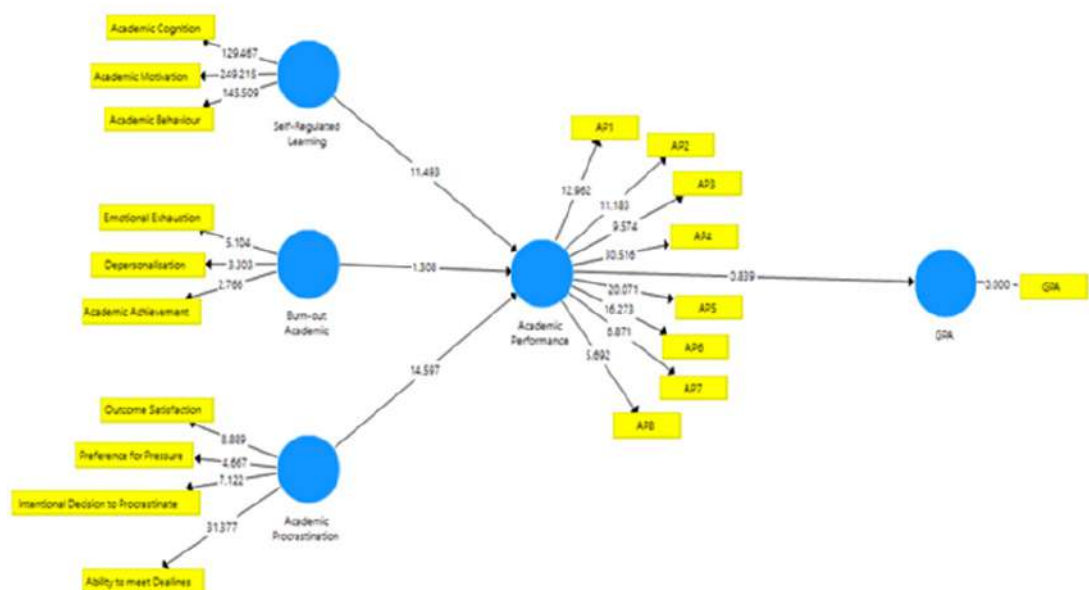


Figure 2. Structure equation model analysis

Ethical consideration

Ethical approval for this study was obtained from the Health Ethics Committee of Universitas Nahdlatul Ulama Surabaya, No. 0151/EC/KEPK/UNUSA/2024

Results

The data revealed that 91.3% of the respondents were female, with the most common age being 21 years (Table 1). The variable self-regulated learning generated high factor loadings, exceeding 0.9, as

did academic burnout. Conversely, the variable academic procrastination showed low factor loadings, particularly for the item "Preference for Pressure," indicating that this item contributes minimally to the latent variable of academic procrastination. Similarly, the variable academic performance displayed low loading factor for items No. 2 ("I pay attention and listen during every discussion"), No. 7 ("I exert more effort when I do difficult assignments"), and No. 8 ("Solving problems is a useful hobby for me") (Figure 1).

Confirmatory Factor Analysis for model fit are SRMR of 0.125, and NFI of 0.620, with an RMS Theta of 0.190, suggesting that the model does not meet the fit criteria. The R-square value of 0.481 implies that self-regulated learning, academic procrastination, and academic burnout collectively influence academic performance (Table 2). The T statistic value for self-regulated learning is 11.493, for academic procrastination it is 14.597 in relation to academic performance, while the T statistic value for academic burnout is 1.308 and for academic performance in relation to GPA it is 0.829 (figure. 2)

Meanwhile, Self-Regulated Learning (SRL): SRL shows a strong positive relationship with Academic Performance (coefficient: 11.493). This suggests that students with higher levels of self-regulated learning tend to perform better academically, Burn-out Academic shows a weak negative relationship with Academic Performance (coefficient: -1.308). Academic Procrastination: Academic Procrastination demonstrates a significant negative relationship with Academic Performance (coefficient: -14.597). Academic Performance is measured through eight indicators (AP1 to AP8), all showing significant loadings, surprisingly, the relationship between Academic Performance and GPA is very weak (coefficient: 0.839) (Figure.2)

The final results indicate that academic procrastination is significantly related to academic performance (p -value < 0.001), as is self-regulated learning (p -value < 0.001). However, academic burnout does not significantly affect academic performance (p -value > 0.005) and academic performance shows no significant impact on GPA (Table 3)

Discussion

The purpose of this study is to analyse the relationships between academic procrastination, academic burnout, self-regulated learning, academic performance, and GPA. The results show that academic procrastination is related to academic performance. This is in line with previous research that states that academic procrastination negatively impacts academic performance, which is detrimental to students (Bahl et al., 2024). It is very clear that the intention to procrastinate and the increasing pressure of deadlines can negatively impact low academic performance. (Kim & Seo, 2015). The online learning system tends to make

students more prone to procrastination compared to offline learning (Sun et al., 2023) (Budury et al., 2022) Other research findings also indicate that Students who tend to procrastinate academically may find it difficult to achieve a state of flow, which can lead to lower academic life satisfaction (Öztekin et al., 2025).

The main reasons for this procrastination behavior are a lack of interest in completing tasks, low self-control (Shi, 2023) and also dependence on peers, and even a dislike for academic assignments (Budury et al., 2022). Recent studies also mention that factors influencing procrastination include stress, health issues, and insufficient self-regulation processes (Araya-Castillo et al., 2023). In the context of online and offline learning, students tend to procrastinate more when using online methods. Students express that offline learning can enhance self-perception and self-efficacy in studying due to direct interaction with peers and lecturers (Muhson et al., 2024).

Academic burnout was found to be uncorrelated with academic performance. It is a complex phenomenon that sometimes does not relate to academic success. This finding is supported by previous research indicating no relationship between academic burnout and performance (Garden, 1991) Other studies suggest that academic burnout is more closely related to poor sleep quality (Figueiredo & Ferreira, 2024) and that emotional intelligence might mediate the relationship between academic burnout and performance (Jurado et al., 2021) These results contrast with other research indicating that academic burnout correlates with poor GPA and academic achievement (Madigan & Curran, 2021) Academic burnout may not affect performance if students possess effective learning regulation strategies and a supportive network like family and friends, allowing them to manage burnout while maintaining good academic performance.

Self-Regulated Learning (SRL): There is a significant relationship between self-regulated learning and academic performance, as supported by previous research (Gorbunova et al., 2024) that the role of SRL in arranging student motivation and behavior allows students to plan and evaluate their learning processes. Previous studies have shown that SRL involves goal setting, applying learning techniques, self-monitoring, and self-adjustment, significantly impacting academic performance (Bahir & Wang, 2023). Effective time management, a critical component of SRL, positively influences academic outcomes. Students who effectively plan their time, both short and long-term, tend to achieve higher academic results (Lourengo & Paiva, 2024). In blended learning environments, mastering digital strategies through SRL is essential for high academic performance. Students proficient in SRL demonstrate better management of cognitive, organizational, and motivational resources, crucial for success in technologically integrated learning contexts (Vargas-Mendoza & Gallardo, 2023)

Academic performance demonstrates no correlation with GPA. Despite its predictive power, GPA alone does not capture all aspects of academic performance, as it primarily reflects grades rather than the full spectrum of student learning and development (Nurudeen et al., 2024). Academic performance and GPA are related but distinct concepts. Academic performance encompasses a broader range of student achievements, including skills, knowledge, and competencies acquired during their education, while GPA is a numerical representation of a student's average performance across courses.

Conclusions

The findings reveal that both academic procrastination and self-regulated learning significantly influence academic performance. However, academic burnout showed no significant relationship with academic performance, and academic performance itself was not directly linked to GPA. The study contributes to the understanding of factors that affect students' academic outcomes, highlighting the importance of managing procrastination and promoting self-regulated learning to enhance performance. Surprisingly, the lack of connection between academic performance and GPA suggests that GPA may not fully capture students' learning or capabilities. Future research should explore additional variables that might influence GPA and assess alternative measures of academic success. Educational institutions are encouraged to implement interventions focused on improving self-regulated learning and reducing procrastination to support better academic outcomes.

Limitation of study, the sample size and demographic characteristics of the participants, which could affect the generalizability of the results to a broader population of students. The results may be specific to the particular academic environment or cultural context in which the study was conducted. Educational systems, grading policies, and student support structures vary across regions, potentially influencing the relationships between the variables studied.

Declaration of Interest

There is no conflict of interest among authors

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Data Availability

Data are available from the corresponding author upon a reasonable request.

References

- Araya-Castillo, L., Burgos, M., González, P., Rivera, Y., Barrientos, N., Yáñez Jara, V., Ganga-Contreras, F., & Sáez, W. (2023). Procrastination in university students: a proposal of a theoretical Model. *Behavioral Sciences*, 13(2), 128. <https://doi.org/10.3390/bs13020128>
- Astuti, A. D. (2024). The effect of self-regulated learning on student academic procrastination. *Tunas: Jurnal Pendidikan Guru Sekolah Dasar*, 9(2), 108–112. <https://doi.org/10.33084/tunas.v9i2.6149>
- Bahir, H., & Wang, X. (2023). Correlation effects of self-regulation on academic performance and self-efficacy in college physical education MOOC learning. *Scientific Journal of Sport and Performance*, 2(3), 395–401. <https://doi.org/10.55860/KGHP5564>
- Bahl, R., Gupta, S., Tanwar, K., Khan, Z., Hakak, I. A., & Amin, F. (2024). Locus of control, academic procrastination and academic performance amongst university students: Moderating role of parental involvement. *Journal of Applied Research in Higher Education*, 17(5), 1881–1897. <https://doi.org/10.1108/JARHE-04-2024-0181>
- Budury, S., Sari, D. J. E., Widiharti, W., Pramesti, T. A., & Hasina, S. N. (2022). Academic procrastination of undergraduate nursing student: A cross-sectional study. *Open Access Macedonian Journal of Medical Sciences*, 10(E), 592–595. <https://doi.org/10.3889/oamjms.2022.8996>
- Budury, S., Setiawan, A. H., Masrurroh, N., & Nero, F. D. L. (2022). Exploring academic procrastination among nursing students during pandemic COVID-19. *Bali Medical Journal*, 11(2), 757–760. <https://doi.org/10.15562/bmj.v11i2.3408>
- Choi, J. N., & Moran, S. V. (2009). Why not procrastinate? development and validation of a new active procrastination scale. *The Journal of Social Psychology*, 149(2), 195–212. <https://doi.org/10.3200/SOCP.149.2.195-212>
- Chun Chu, A. H., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination behavior on attitudes and performance. *The Journal of Social Psychology*, 145(3), 245–264. <https://doi.org/10.3200/SOCP.145.3.245-264>
- Fauziah, I., Maarif, S., & Pradipta, T. R. (2018). Improving students' mathematical communication skills and self-regulated learning through the problem-based learning model. *Jurnal Analisa*, 4(2), 90–98. <https://doi.org/10.15575/ja.v4i2.3916>
- Figueiredo, S., & Ferreira, S. (2024). Vulnerability and academic burnout in the university context: Interaction events, social exchanges, and resilience behaviours. *Higher Education*

- Quarterly*, 17(1), e12562. <https://doi.org/10.1111/hequ.12562>
- Garden, A.-M. (1991). Relationship between burnout and performance. *Psychological Reports*, 68(3), 963–977. <https://doi.org/10.2466/pr0.1991.68.3.963>
- Gorbunova, A., Lange, C., Savelyev, A., Adamovich, K., & Costley, J. (2024). The interplay of self-regulated learning, cognitive load, and performance in learner-controlled environments. *Education Sciences*, 14(8), 860. <https://doi.org/10.3390/educsci14080860>
- Goyal, Y., Mittal, V., & Kapoor, P. (2024). Understanding academic procrastination: causes, correlates, and gender nuances for enhanced self-regulated learning. *International Journal For Multidisciplinary Research*, 6(1). <https://doi.org/10.36948/ijfmr.2024.v06i01.11673>
- Jurado, M. del M. M., Pérez-Fuentes, M. del C., Martos Martínez, Á., Barragán Martín, A. B., Simón Márquez, M. del M., & Gázquez Linares, J. J. (2021). Emotional intelligence as a mediator in the relationship between academic performance and burnout in high school students. *PLOS ONE*, 16(6), e0253552. <https://doi.org/10.1371/journal.pone.0253552>
- Kim, K. R., & Seo, E. H. (2015). The relationship between procrastination and academic performance: A meta-analysis. *Personality and Individual Differences*, 82, 26–33. <https://doi.org/10.1016/j.paid.2015.02.038>
- Liu, Z., Xie, Y., Sun, Z., Liu, D., Yin, H., & Shi, L. (2023). Factors associated with academic burnout and its prevalence among university students: a cross-sectional study. *BMC Medical Education*, 23(1), 317. <https://doi.org/10.1186/s12909-023-04316-y>
- Loureño, A. A., & Paiva, M. O. (2024). Academic performance of excellence: the impact of self-regulated learning and academic time management planning. *Knowledge*, 4(2), 289–301. <https://doi.org/10.3390/knowledge4020016>
- Madigan, D. J., & Curran, T. (2021). Does burnout affect academic achievement? a meta-analysis of over 100,000 students. *Educational Psychology Review*, 33(2), 387–405. <https://doi.org/10.1007/s10648-020-09533-1>
- Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior*, 2(2), 99–113. <https://doi.org/10.1002/job.4030020205>
- Muhson, A., Mulyani, E., Susilowati, N., Alwi, A. C., & Prilanita, Y. N. (2024). Student academic procrastination in online and offline learning. *Technium Social Sciences Journal*, 53, 182–191. <https://doi.org/10.47577/tssj.v53i1.10309>
- Nurudeen, A. H., Fakhrou, A., Lawal, N., & Ghareeb, S. (2024). Academic performance of engineering students: A predictive validity study of first-year GPA and final-year CGPA. *Engineering Reports*, 6(5). <https://doi.org/10.1002/eng2.12766>
- Öztekin, G. G., Rizzo, A., Alkhulayfi, A. M. A., & Yıldırım, M. (2025). The mediating role of flow experiences in the relationship between academic procrastination and academic life satisfaction among undergraduate students. *Discover Psychology*, 5(1), 1. <https://doi.org/10.1007/s44202-025-00323-w>
- Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology*, 8. <https://doi.org/10.3389/fpsyg.2017.00422>
- Puah, S., Lim, S. M., Kok, X.-F. K., & Devilly, O. (2024). The longitudinal study on the reciprocal effects between GPA and burnout in university students: exploring grit, self-efficacy, and resilience as moderators. *Frontiers in Education*, 9. <https://doi.org/10.3389/educ.2024.1408058>
- Purwanto, C. V., & Natalya, L. (2019). Tomorrow will always come, i am a last-minute person: Validation of the active procrastination scale-bahasa Indonesia. *Makara Human Behavior Studies in Asia*, 23(1), 46. <https://doi.org/10.7454/hubs.asia.1130118>
- Rad, H. F., Bordbar, S., Bahmaei, J., Vejdani, M., & Yusefi, A. R. (2025). Predicting academic procrastination of students based on academic self-efficacy and emotional regulation difficulties. *Scientific Reports*, 15(1). <https://doi.org/10.1038/s41598-025-87664-7>
- Ragusa, A., González-Bernal, J., Trigueros, R., Caggiano, V., Navarro, N., Minguez-Minguez, L. A., Obregón, A. I., & Fernandez-Ortega, C. (2023). Effects of academic self-regulation on procrastination, academic stress and anxiety, resilience and academic performance in a sample of Spanish secondary school students. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1073529>
- Raković, M., Bernacki, M. L., Greene, J. A., Plumley, R. D., Hogan, K. A., Gates, K. M., & Panter, A. T. (2022). Examining the critical role of evaluation and adaptation in self-regulated learning. *Contemporary Educational Psychology*, 68, 102027. <https://doi.org/10.1016/j.cedpsych.2021.102027>
- Salguero-Pazos, M. R., & Reyes-de-Cózar, S. (2023). Interventions to reduce academic procrastination: A systematic review. *International Journal of Educational Research*, 121, 102228. <https://doi.org/10.1016/j.ijer.2023.102228>
- Schaufeli, W. B., Martínez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B. (2002). Burnout and engagement in university students. *Journal of Cross-Cultural Psychology*, 33(5), 464–481. <https://doi.org/10.1177/0022022102033005003>
- Shi, X. (2023). College students academic procrastination behavior and its impact on

- academic performance. *Lecture Notes in Education Psychology and Public Media*, 12(1), 234–244. <https://doi.org/10.54254/2753-7048/12/20230816>
- Steel, P., & König, C. J. (2006). Integrating theories of motivation. *Academy of Management Review*, 31(4), 889–913. <https://doi.org/10.5465/amr.2006.22527462>
- Sun, T., Huynh, R., & Kim, J.-E. (2023). Academic procrastination as a mediator between learning environment and academic performance. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 67(1), 1578–1582. <https://doi.org/10.1177/21695067231192638>
- Vargas-Mendoza, L., & Gallardo, K. (2023). Influence of self-regulated learning on the academic performance of engineering students in a blended-learning environment. *International Journal of Engineering Pedagogy (IJEP)*, 13(8), 84–99. <https://doi.org/10.3991/ijep.v13i8.38481>
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, 41(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

Translation and validation of the maternal fetal attachment scale in bahasa Indonesia version

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Abstract

Background: Maternal–fetal attachment (MFA) refers to the emotional bond between a pregnant woman and her unborn child, influencing maternal behaviors and fetal outcomes. The Maternal Fetal Attachment Scale (MFAS) is widely used to assess MFA; however, cultural adaptation is necessary to ensure its validity across different populations.

Purpose: This study aimed to translate, culturally adapt, and validate the MFAS for use in Bahasa Indonesia with adequate psychometric properties.

Methods: A cross-sectional study was conducted among 250 pregnant women attending antenatal clinics in West Java, Indonesia. The MFAS was translated following Beaton et al.'s cross-cultural adaptation guidelines. Content validity was evaluated using the Content Validity Index (CVI) and expert review. Construct validity was assessed through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Reliability was examined using Cronbach's alpha and the Intraclass Correlation Coefficient (ICC).

Results: The Bahasa Indonesia MFAS showed excellent content validity (S-CVI = 1.00). EFA revealed a unidimensional structure explaining 40.76% of the variance, with factor loadings ranging from 0.43 to 0.88. CFA demonstrated good model fit (CFI > 0.90; RMSEA ≤ 0.08). The scale showed high internal consistency (Cronbach's alpha = 0.899) and good test–retest reliability (ICC = 0.779).

Conclusion: The Bahasa Indonesia version of the MFAS is a valid and reliable instrument for assessing maternal–fetal attachment and can be effectively used in maternal health research and clinical practice.

Keywords: maternal fetal attachment scale; maternal health; maternal-fetal attachment; prenatal care; psychometric validation

Introduction

Maternal-fetal attachment (MFA) refers to the emotional bond that develops between a mother and her unborn child during pregnancy. This bond plays a critical role in fostering maternal behaviors that positively impact both maternal and infant well-being (Trombetta et al., 2021). Research highlights that strong MFA is associated with healthier prenatal behaviors, including adherence to medical advice, optimal nutrition, regular physical activity, and reduced substance use, all of which contribute to better pregnancy outcomes (Gobel, 2020; McNamara et al., 2019). These behaviors collectively enhance fetal development, reduce the risk of complications, and improve maternal mental health. Conversely, low maternal-fetal attachment has been linked to adverse outcomes, such as increased maternal stress, suboptimal prenatal care, and postpartum depression (Lima et al., 2024). Maternal stress during pregnancy has been identified as a significant predictor of low birth weight and preterm delivery, often mediated by elevated cortisol levels (Hudson et al., 2020). Furthermore, low MFA is associated with diminished maternal responsiveness postpartum, which can negatively affect early infant development and attachment patterns (Rossen et al., 2017). Therefore,

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understanding and addressing factors influencing MFA are critical for improving maternal and neonatal health outcomes.

Cultural and psychosocial factors significantly influence the development of maternal–fetal attachment (MFA). For example, studies suggest that cultural norms related to pregnancy, maternal roles, and social support systems shape how mothers perceive and bond with their unborn child (Sacchi et al., 2021). In collectivist societies, where extended family support is emphasized, maternal stress levels may be lower, positively influencing MFA, whereas in more individualistic contexts, limited community support may contribute to higher stress and weaker attachment (da Rosa et al., 2021). Recognizing these cultural nuances is essential for developing culturally sensitive interventions to promote MFA.

Accurate measurement of MFA is therefore critical in maternal health research. Instruments such as the Maternal-Fetal Attachment Scale (MFAS) and the Prenatal Attachment Inventory (PAI) are widely used to assess the strength of maternal bonding during pregnancy and have been applied in several Indonesian studies to examine MFA in relation to maternal psychological well-being, prenatal adaptation, and health-related behaviors. Despite their growing use in Indonesia, these instruments require rigorous cultural adaptation and psychometric validation to ensure their relevance and accuracy within local contexts (Branjerdporn et al., 2017). For instance, the MFAS emphasizes behaviors such as talking or singing to the fetus, which may not be culturally normative or consistently practiced in some Indonesian settings, highlighting the need for culturally appropriate validation.

The Maternal Fetal Attachment Scale (MFAS), developed by Cranley (1981), is a widely used instrument for assessing maternal–fetal attachment (MFA) across five behavioral dimensions. The scale has been validated in various languages and cultural settings, supporting its usefulness in cross-cultural research (McNamara et al., 2019; Trombetta et al., 2021). However, a culturally adapted and psychometrically validated Bahasa Indonesia version of the MFAS is not yet available. This gap is critical given that maternal attachment behaviors are shaped by sociocultural norms, family structures, and beliefs that differ from the Western contexts in which the MFAS was originally developed. Without cultural adaptation, MFAS items may not fully capture attachment expressions among Indonesian women, potentially resulting in measurement bias. Therefore, translation and validation of the MFAS into Bahasa Indonesia are essential to ensure accurate assessment and to support maternal health research and practice in Indonesia.

In Indonesia, maternal health remains a public health priority due to persistently high maternal and neonatal mortality rates. The World Health Organization reported that Indonesia has one of the highest maternal mortality ratios in Southeast Asia, with a substantial proportion of deaths attributable to

preventable factors, including inadequate antenatal care utilization. The World Health Organization (WHO, 2020). Addressing this challenge requires a holistic approach that integrates not only physical health but also psychological and emotional dimensions of pregnancy.

Maternal–fetal attachment (MFA) has been identified as a key psychosocial factor influencing maternal health behaviors and pregnancy outcomes. Previous studies have shown that stronger MFA is associated with improved adherence to antenatal care, healthier lifestyle behaviors during pregnancy, and better maternal mental health (Suryaningsih et al., 2020; Posada et al., 2018). These findings underscore the importance of accurately assessing MFA within maternal health programs. However, the absence of a culturally validated MFA measurement tool in Indonesia limits the ability to systematically evaluate this construct and to design evidence-based interventions. Therefore, validating the MFAS in the Indonesian context is essential to support research, clinical assessment, and policy efforts aimed at improving maternal and neonatal outcomes.

Although tools like the MFAS have the potential to provide critical insights into maternal mental health and attachment, directly applying instruments developed in different cultural contexts may lead to inaccuracies. This is primarily due to linguistic nuances and cultural differences that could affect how items are understood and interpreted (Beaton et al., 2000; Sousa & Rojjanasrirat, 2011). For instance, cultural norms in Indonesia, such as the emphasis on family involvement during pregnancy and the role of traditional beliefs in maternal care, may shape maternal behaviors and attitudes in ways not captured by instruments developed in Western contexts (Herwansyah et al., 2022). Translation and validation processes are therefore essential to adapt instruments like the MFAS for use in Indonesia, ensuring they maintain both reliability and validity within the local population (Clark & Watson, 2016).

The lack of standardized and culturally relevant tools to assess maternal-fetal attachment in Indonesia represents a significant gap in maternal health research. While some studies have explored maternal mental health and attachment in the Indonesian context, the absence of validated instruments limits the ability of researchers and healthcare providers to accurately measure and address these constructs (Kamarudin et al., 2024). Translation and validation of the MFAS into Bahasa Indonesia would address this gap by providing a psychometrically sound tool for assessing maternal-fetal attachment in Indonesian women. This process involves rigorous methodology, including forward and backward translation, content validation, pilot testing, and psychometric evaluation, to ensure cultural appropriateness and statistical reliability (Connelly, 2022).

By developing a culturally adapted version of the MFAS, healthcare providers and researchers in

Table 1. Content Validity Index for Parent Attachment Scale Based on Aiken's Value Formula

Item	Ex- am- in-er 1 Value (R)	S = R - Lo	Ex- am- in-er 2 Value (R)	S = R - Lo	Ex- am- in-er 3 Value (R)	S = R - Lo	Ex- amin- er 4 Value (R)	S = R - Lo	Ex- amin- er 5 Value (R)	S = R - Lo	ΣS	V
1	4	3	4	3	4	3	4	3	4	3	15	1.00
2	3	2	4	3	4	3	4	3	4	3	14	0.93
3	4	3	4	3	4	3	4	3	4	3	14	0.93
4	3	2	4	3	4	3	4	3	4	3	14	0.93
5	4	3	4	3	4	3	4	3	4	3	14	0.93
6	4	3	4	3	4	3	3	2	4	3	14	0.93
7	4	3	4	3	4	3	4	3	3	2	14	0.93
8	3	2	4	3	4	3	4	3	4	3	14	0.93
9	3	2	4	3	4	3	4	3	4	3	14	0.93
10	4	3	4	3	4	3	4	3	4	3	15	1.00
11	3	2	4	3	4	3	4	3	4	3	14	0.93
12	4	3	4	3	4	3	4	3	4	3	14	0.93
13	3	2	4	3	4	3	4	3	4	3	14	0.93
14	4	3	4	3	4	3	4	3	4	3	14	0.93
15	4	3	4	3	4	3	4	3	4	3	15	1.00
16	4	3	4	3	4	3	4	3	4	3	15	1.00
17	3	2	4	3	4	3	4	3	4	3	14	0.93
18	4	3	4	3	4	3	4	3	4	3	15	1.00
19	3	2	4	3	4	3	4	3	4	3	14	0.93
20	4	3	4	3	4	3	4	3	4	3	15	1.00
21	3	2	4	3	4	3	4	3	4	3	14	0.93
22	4	3	4	3	4	3	4	3	4	3	15	1.00
23	3	2	4	3	4	3	4	3	4	3	14	0.93
24	4	3	4	3	4	3	4	3	4	3	15	1.00

Note: Items with a CVI ≥ 0.93 were considered valid, indicating excellent content validity.

Indonesia could gain deeper insights into maternal-fetal attachment and its determinants, facilitating the design of targeted interventions to improve maternal and neonatal outcomes. For example, culturally appropriate antenatal education programs that strengthen maternal-fetal attachment could be implemented to address psychological distress and promote healthy behaviors during pregnancy (Gonzales Jr & Barcelo, 2023). This study aims to fill the existing gap by translating the MFAS into Bahasa Indonesia and validating its psychometric properties in a population of pregnant Indonesian women, thus contributing to the development of evidence-based maternal health interventions.

Materials and Methods

Study design

The objective of this investigation was to translate, adapt, and validate the Maternal Fetal Attachment

Scale (MFAS) into the Bahasa Indonesia version through the use of a cross-sectional design. The research endeavored to evaluate the psychometric properties of the translated scale by means of a structured process that included translation, validation, and reliability assessment.

Sample

The participants were pregnant women attending antenatal care clinics in West Java, Indonesia, at the time of data collection. Eligible participants were women aged 18 years or older, able to read and understand Bahasa Indonesia, and willing to provide informed consent. To ensure adequate experience of maternal-fetal attachment, only women in the second and third trimesters of pregnancy (≥ 14 weeks of gestation) were included, as MFA is considered more stable and perceptible after fetal movements are commonly experienced. Women with diagnosed mental disorders or cognitive impairments were excluded from the study.

Table 2. Factors loading of MFAS

Item	Factor Load-ing	Eigenvalue	Variance Explained (%)
1	0.76	0.465	40.54
2	0.88		
3	0.65		
4	0.66		
5	0.58		
6	0.76		
7	0.83		
8	0.65		
9	0.66		
10	0.47		
11	0.51		
12	0.43		
13	0.49		
14	0.63		
15	0.81		
16	0.55		
17	0.72		
18	0.77		
19	0.61		
20	0.67		
21	0.64		
22	0.71		
23	0.73		
24	0.68		

Table 3. CFA results for the MFAS Scale

Domain	χ^2	χ^2/df	RMSEA	SRMR	CFI	NNFI	GFI
Differentiation from the baby	38.87	1.991	0.081	0.062	0.915	0.917	0.918
Interaction with the baby	37.91	1.956	0.075	0.062	0.932	0.919	0.943
Attribution of attributes to the ba-by	39.01	1.912	0.081	0.061	0.927	0.921	0.932
Role-playing	38.76	1.965	0.074	0.060	0.922	0.923	0.933

Table 4. Reliability of MFAS

Domain	Cronbach's Alpha	Item-Total Correla- tion Range(n = 144)	Intraclass Correlation Co- efficient (ICC) (n = 72)
Differentiation from the Baby	0.899	0.456 – 0.687	0.775
Interaction with the Ba-by	0.925	0.533 – 0.728	0.765
Attribution of Attributes to the Baby	0.901	0.516 – 0.730	0.780
Role-Playing	0.913	0.603 – 0.786	0.779

Parity was not used as an inclusion or exclusion criterion, allowing participation of both primigravida and multigravida women. This approach was adopted to capture a broad range of maternal experiences and to enhance the generalizability of the psychometric evaluation of the MFAS across different reproductive histories.

The sample size was determined based on the recommended ratio of 5–10 participants per item for factor analysis (Costello & Osborne, 2005). Given that the MFAS comprises 24 items, a minimum of 120 participants was required for exploratory factor analysis (EFA). A total of 250 participants were recruited, providing an adequate sample size for

both EFA and confirmatory factor analysis (CFA), consistent with recommendations for psychometric validation studies (Worthington & Whittaker, 2006).

Instrument

The Maternal Fetal Attachment Scale (MFAS) was developed by Cranley (1981) to assess the degree of emotional attachment a pregnant woman has toward her unborn fetus. The MFAS consists of 24 items rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), yielding total scores from 24 to 120, with higher scores indicating stronger maternal-fetal attachment. The original instrument demonstrated good internal consistency, with a Cronbach's alpha of 0.85. Since its development, the MFAS has been widely used in academic and clinical research and validated across diverse populations and cultural contexts, supporting its reliability and applicability for research purposes when appropriately cited. Validation studies of the MFAS have involved diverse demographic groups, including variations in age, gestational age, parity, educational level, and cultural background, consistently demonstrating reliable psychometric performance.

Procedure

Translation process

The translation procedure followed the cross-cultural adaptation guidelines proposed by Beaton et al. (2000) to ensure linguistic accuracy and cultural relevance. Initially, two independent multilingual translators translated the MFAS into Bahasa Indonesia. This step aimed to preserve the conceptual meaning of the original items while accommodating linguistic differences. A council of specialists then reviewed and synthesized the two forward translations into a single preliminary version.

The council of specialists consisted of five experts: two senior midwifery lecturers with extensive experience in antenatal care, one obstetrician specializing in maternal health, one clinical psychologist with expertise in perinatal mental health, and one nursing researcher experienced in psychometric instrument development. During this stage, all translation decisions, discrepancies, and cultural considerations were systematically documented in written review notes and item-by-item comparison forms.

Particular attention was given to items referring to behaviors such as verbal interaction with the fetus (e.g., talking or singing) and psychological differentiation of the fetus as an individual, which may be expressed differently in Indonesian cultural and religious contexts. These items were rephrased using culturally familiar expressions that reflect common maternal practices in Indonesia, such as internal communication, prayer, or emotional reflection, while preserving their original conceptual intent. No items were removed or added during this process.

Back-translation was subsequently conducted by two bilingual translators who were independent of the initial translation process and blinded to the original MFAS. This step aimed to identify inconsistencies or conceptual deviations in the synthesized Bahasa Indonesia version.

Validation

Content validity

The content validity of the translated Maternal Fetal Attachment Scale (MFAS) was assessed using the Content Validity Index (CVI) by the same expert panel, consisting of three obstetricians and two psychologists. The CVI is commonly used to assess item and scale validity. Items having a CVI score of ≥ 0.78 met content validity requirements (Polit et al., 2007). This rigorous methodology guarantees that the instrument correctly captures the targeted ideas and is suitable for the target demographic. The expert panel assessed instrument content using Kappa statistics to measure inter-rater agreement. Kappa values evaluate agreement beyond chance, improving comprehension of experts' conclusions. Abstract concept evaluation involves thorough theoretical preparation and systematic expert assessment to improve content validity (Polit et al., 2007). The theoretical framework led domain conceptualization and item generation to fit with research constructs. The first step was a comprehensive literature analysis and theoretical mapping to identify maternal-fetal attachment domains. This stage influenced the instrument's first draft. In the second phase, five nursing healthcare experts and scientific researchers rated each item's relevance and lucidity on a four-point scale from 1 (totally irrelevant) to 4 (extremely appropriate). The experts were notified of instrument modifications and clarifications to offer informed input. Their ratings helped refine the instrument by identifying and correcting content gaps. Expert input improved the content validity of the translated MFAS, making it a trustworthy tool for measuring maternal-fetal attachment in the target demographic. Iterative expert consultation and statistical validation verify the instrument's completeness and relevance.

Construct Validity

For the purpose of determining the underlying factor structure of the Maternal Fetal Attachment Scale (MFAS), an exploratory factor analysis (EFA) was carried out. For the purpose of identifying hidden factors that have an effect on observable data, EFA is a statistical method. A method known as principal axis factoring was utilized in this investigation for the purpose of component extraction. This method is particularly well-suited for data that might not satisfy the assumption of multivariate normality. The retention of factors was evaluated using both statistical and visual methods. Keeping components that have eigenvalues greater than one was recommended by the Kaiser criterion (Kaiser, 1960).

due to the fact that these components adequately explain a significant portion of the variation in the dataset. Additionally, a scree plot was investigated in order to ascertain the optimal number of components that should be preserved in the event that the slope of the eigenvalue becomes flat (Cattell, 1985). These techniques ensured that the identification of factors was both reliable and significant. The exploratory factor structure was validated through the use of CFA following the EFA. CFA conducts a comparison of the factor structure of the assumed model with the facts that can be observed (da Rosa et al., 2021). The model's fit was evaluated using multiple fit indices in great detail. According to Bentler (1990), a model was considered to have a good fit when both the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) were greater than 0.90. According to Hu and Hu and Bentler (1999), the Root Mean Square Error of Approximation (RMSEA) was calculated, and values that were lower than 0.06 indicated that the match was of a satisfactory quality. According to Kline (2023), a suitable match was also determined by the Standardized Root Mean Square Residual (SRMR), which was found to be within the range of 0.08 to 0. When taken as a whole, these indices provide a complex evaluation of the validity of the factor structure, so ensuring that the model is trustworthy for any future research or practical applications.

Reliability Testing

The internal consistency of the scale was evaluated with the use of Cronbach's alpha, which is a statistical measure that determines how closely linked the items are to one another as a group. High levels of Cronbach's alpha indicate that there is a high degree of internal consistency, which indicates that all of the items evaluate the same notion. According to Tavakol and Dennick (2011), the Cronbach's alpha should be at least 0.70, although this may change depending on the context of the scale and the purpose. For the purpose of determining the dependability of each item, the correlation between each item and the overall score was evaluated. This stage is responsible for identifying components that are not contributing to the build and have poor performance. Because low item-total correlations may indicate duplication or irrelevance, the items in question ought to be modified or removed in order to enhance the reliability of the scale (Field, 2024). The Intraclass Correlation Coefficient (ICC) was utilized in order to evaluate the stability of the scale over a period of two weeks. ICC is used to evaluate test-retest reliability, which refers to the consistency of two measurements that were carried out at different times. A high level of dependability is indicated by an ICC score of 1, which indicates that the results are dependable when the conditions are consistent. According to Koo and Li (2016), this phase is critical because it ensures that the scale accurately represents the construct of interest on a constant basis.

Data Analysis

In order to evaluate the psychometric properties of the instrument, data analysis was conducted using IBM SPSS Statistics Version 25 and IBM SPSS AMOS Version 26 under an institutional licensed software. The CVI values for each item and the scale were computed in order to evaluate the content validity of the scale. It uses expert consensus to determine whether or not the items in question are reflective of the concept that is being investigated (Polit & Beck, 2006). An exploratory factor analysis, also known as EFA, was then utilized in order to ascertain the factor structure of the instrument. According to Tabachnick et al. (2007), principal component analysis with varimax rotation was used to extract components, with the components that had eigenvalues greater than one being retained. CFA is able to validate the factor structure that was identified by EFA. The CFI, TLI, and RMSEA model fit indices were computed by AMOS computer. The model's ability to match the data was quantified by these metrics (Kline, 1999). The Cronbach's alpha statistic, which assesses how effectively different scale items measure the same notion, was utilized in order to evaluate the reliability of the internal consistency. It was determined that values greater than 0.70 were acceptable for reliability (DeVellis & Thorpe, 2021). The Intraclass Correlation Coefficient (ICC) was used to quantify the stability of the instrument over time in order to evaluate the reliability of the test-retest. Koo and Li (2016) found that an ICC greater than 0.75 suggested an excellent level of dependability.

Ethical Considerations

The study was approved by the STIKes Cirebon Institutional Review Board (IRB) (Approval Number: 0189ETIK) for ethical reasons. Before enrolling any participant, we made sure to get their written informed permission. The study maintained strict secrecy and all participants were asked to voluntarily participate. Feedback regarding the research procedure and the instrument was solicited from participants.

Results

Content validity

Content validity of the translated Maternal-Fetal Attachment Scale (MFAS) was assessed using the Content Validity Index (CVI) based on expert ratings calculated with Aiken's V formula. Five experts independently evaluated each item for clarity and relevance using a four-point rating scale. The scale-level CVI (S-CVI) for both clarity and relevance was 1.00, indicating excellent overall content validity.

All 24 original items were retained in the final Bahasa Indonesia version, and no items were removed during the expert review process. Minor wording modifications were made to several items to enhance semantic clarity and cultural appropriateness while preserving their original conceptual meaning. These revisions mainly involved items related to maternal-fetal interaction

and role-taking behaviors, which required contextual adjustment to reflect common maternal practices in Indonesia.

After revision, all items achieved an Aiken's V value of ≥ 0.93 , demonstrating strong item-level content validity (Table 1).

Cultural adaptation incorporated key Indonesian sociocultural values related to motherhood, including spiritual reflection, religious practices such as prayer, collective family orientation, and the perception of pregnancy as a moral and emotional responsibility. In this context, maternal–fetal attachment is often expressed through internal reflection, prayer, and emotional awareness rather than explicit verbal interaction. These cultural considerations were integrated into item wording to ensure experiential and conceptual equivalence without altering the underlying construct of maternal–fetal attachment.

Construct validity

Good construct validity is demonstrated by the Maternal-Fetal Attachment Scale (MFAS), with factor loadings ranging from 0.43 to 0.88. With a Kaiser-Meyer-Olkin (KMO) value of 0.941, which indicates sampling adequacy, the sample was considered suitable for factor analysis. The data were deemed suitable for factor analysis since Bartlett's test of sphericity yielded a significant result ($X^2 = 2136.32$, $P < 0.001$). An eigenvalue greater than 1 was found in one principal component, which accounted for 40.76 percent of the total variance. It follows that the MFAS must be one-dimensional. Table 2 shows that the factor loadings for all items were in the range of 0.43 to 0.88.

The confirmatory factor analysis (CFA) further validated the structure of the MFAS. The model fit indices for the domains were within acceptable thresholds, suggesting good model fit. Table 3 summarizes the CFA results for each domain of the MFAS. All domains achieved a χ^2/df value below 2, indicating an excellent model fit. RMSEA values for all domains were within the acceptable range (≤ 0.08), signifying a close approximation of the model to the observed data. SRMR values were all ≤ 0.062 , indicating low residuals and a good model fit. Both indices exceeded 0.90 for all domains, showing a strong comparative and incremental fit of the model. GFI values for all domains were above 0.90, confirming the adequacy of the model fit.

Reliability

The Cronbach's alpha coefficient of the MFAS scale was 0.899, and the intraclass correlation coefficient (ICC) for test-retest reliability was 0.779. The item-total correlations ranged between 0.456 and 0.687, while the item-total score correlations for the measure were between 0.533 and 0.728 (Table 4).

Discussion

This study aimed to translate, culturally adapt, and validate the Maternal–Fetal Attachment Scale

(MFAS) for use among pregnant women in Indonesia. The findings demonstrate that the Bahasa Indonesia version of the MFAS exhibits strong psychometric properties, including excellent content validity, high internal consistency, acceptable test–retest reliability, and satisfactory construct validity. These results support the suitability of the instrument for assessing maternal–fetal attachment (MFA) within the Indonesian cultural context.

The construct validity analysis revealed a unidimensional factor structure, explaining 40.76% of the total variance, which differs from the original five-factor model proposed by Cranley (1981). The original MFAS conceptualized MFA as a multidimensional construct encompassing differentiation of self from the fetus, interaction with the fetus, attributing characteristics to the fetus, giving of self, and role-taking. In contrast, the Indonesian version suggests that these dimensions converge into a single overarching construct representing a holistic emotional bond between the mother and the fetus. This finding indicates that, within the Indonesian context, MFA may be perceived less as a set of distinct behavioral domains and more as an integrated emotional experience.

Such structural differences are consistent with findings from previous cross-cultural validation studies of the MFAS. For example, the Turkish adaptation identified a three-factor structure, which was attributed to sociocultural perceptions of motherhood and fetal personhood (Golbasi et al., 2015). Similar reductions or modifications in factor structure have been reported in other cultural settings, highlighting that the manifestation and interpretation of maternal–fetal attachment are culturally embedded. In collectivist societies such as Indonesia, maternal roles are strongly influenced by family values, religious beliefs, and social expectations, which may lead women to perceive attachment-related behaviors as inseparable components of a unified emotional connection rather than as distinct actions or cognitions.

The translation and semantic adaptation process may have also contributed to the observed structural differences. Although all original MFAS items were retained, subtle shifts in meaning during translation—particularly in items related to psychological differentiation or attributing individual characteristics to the fetus—may have influenced how participants interpreted and responded to these items. Such semantic nuances are well-documented challenges in cross-cultural instrument adaptation and may affect item clustering in factor analysis. These findings underscore the importance of culturally grounded validation rather than direct adoption (Sacchi et al., 2021), instruments developed in Western contexts.

Despite differences in factor structure, the Bahasa Indonesia MFAS demonstrated excellent reliability, with a Cronbach's alpha of 0.899 and good test–retest stability ($ICC = 0.779$). These values are comparable to, or exceed, those reported

in previous international studies, including the original MFAS ($\alpha = 0.85$) and validations conducted in European populations [Sacchi et al. \(2021\)](#). The strong reliability indicators suggest that the scale consistently measures the MFA construct among Indonesian women.

The availability of a valid and reliable MFAS is particularly important given the established role of maternal–fetal attachment in influencing maternal behaviors and pregnancy outcomes. Previous studies have shown that higher MFA is associated with better adherence to antenatal care, healthier lifestyle behaviors, reduced pregnancy-related anxiety, and improved neonatal outcomes, including optimal birth weight and reduced risk of preterm birth ([Posada et al., 2018](#); [Trombetta et al., 2021](#)). Conversely, low MFA has been linked to adverse outcomes such as postpartum depression and difficulties in early mother–infant bonding. Therefore, the validated Indonesian MFAS provides a valuable tool for identifying women at risk of low attachment and for informing early psychosocial interventions.

Furthermore, the findings reinforce the adaptability of the MFAS across linguistic and cultural contexts. Similar to adaptations conducted in Brazil and other countries [Lima et al. \(2022\)](#) the Indonesian version maintains the conceptual integrity of MFA while reflecting local cultural meanings. This adaptability is essential for maternal health research, where culturally sensitive measurement tools are needed to guide evidence-based clinical practice and policy development.

Overall, the Bahasa Indonesia version of the MFAS represents a psychometrically sound instrument that captures the emotional bond between pregnant women and their unborn children within the Indonesian sociocultural framework. Its use can facilitate more accurate assessment of maternal–fetal attachment in both research and clinical settings, supporting the development of target ([Shieh et al., 2021](#); [Kołomańska-Bogucka et al., 2022](#)).

Implications for Clinical Practice

The findings underscore the importance of integrating MFAS assessments into routine prenatal care, as they provide valuable insights into the emotional connection between expectant mothers and their unborn children. Early identification of mothers with low attachment scores allows healthcare professionals to tailor interventions that address specific emotional or psychological challenges. These targeted interventions, such as individualized counselling sessions or structured educational programs, are designed to enhance MFA by promoting maternal awareness, emotional bonding, and positive perceptions of the pregnancy. Such improvements in MFA have a cascading effect on overall maternal well-being, reducing stress, anxiety, and depression, which are often associated with poor attachment. Additionally, strengthened maternal–fetal bonds are linked to better neonatal

outcomes, including healthier birth weights, more consistent breastfeeding practices, and improved infant emotional development. By fostering secure attachment bonds during pregnancy, these interventions also set the stage for stronger mother–infant relationships post-birth, supporting the infant's psychological and emotional resilience in the long term. Therefore, routine MFA assessments serve as a proactive tool in prenatal care, bridging gaps in maternal and child health and contributing to more holistic and effective perinatal care strategies.

Limitations

Despite its strengths, this study acknowledges limitations, including potential self-report biases in MFAS responses, where participants may answer in socially desirable ways. Future research could address this limitation by integrating complementary methods, such as observational or physiological assessments, for a more holistic understanding of MFA ([Røhder et al., 2020](#)). Additionally, validating the MFAS in specific subpopulations, such as high-risk pregnancies, would confirm its generalizability ([da Rosa et al., 2021](#)). Longitudinal studies examining the impact of MFA on child development outcomes could further elucidate the importance of early attachment interventions.

Conclusion

The Maternal-Fetal Attachment Scale (MFAS) is a critical tool for advancing maternal and fetal health research and practice. Its applications extend beyond clinical use, serving as a valuable resource in understanding the complexities of maternal behaviors and emotional connections during pregnancy. The MFAS facilitates the exploration of attachment processes, providing insights into how maternal attitudes, feelings, and actions towards the fetus can impact maternal health outcomes and fetal development. In academic research, the MFAS contributes to broader inquiries into psychological and physiological factors influencing pregnancy, including stress, anxiety, and maternal well-being. It enables researchers to evaluate the effectiveness of interventions aimed at enhancing maternal–fetal bonding and mitigating risks associated with poor attachment. Moreover, the MFAS supports cross-disciplinary studies, bridging fields such as psychology, obstetrics, and pediatrics, to explore how maternal–fetal attachment predicts postnatal parenting behaviors and child development. Clinically, the MFAS informs healthcare providers in tailoring prenatal care plans to address attachment-related concerns. By identifying mothers with lower attachment scores, clinicians can implement targeted strategies, such as counseling or educational programs, to strengthen the mother–fetus relationship. Overall, the MFAS is an indispensable instrument that not only enhances individual care but also contributes to advancing evidence-based practices and policies in maternal

and child health.

Declaration of Interest

All authors declare no conflict of interest.

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Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

References

- Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*, 25(24), 3186.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), <https://escholarship.org/content/qt2mk8r49v/qt2mk8r49v.pdf>.
- Branjerdporn, G., Meredith, P., Strong, J., & Garcia, J. (2017). Associations between maternal-fetal attachment and infant developmental outcomes: A systematic review. *Maternal and Child Health Journal*, 21, 540–549. <https://doi.org/10.1007/s10995-016-2138-2>.
- Cattell, R. B. (1985). Intelligence and g: An imaginative treatment of unimagined data. *Behavioral and Brain Sciences*, 8(2), 227. <https://doi.org/10.1017/S0140525X00020471>
- Clark, L. A., & Watson, D. (2016). Constructing validity: Basic issues in objective scale development. In A. E. Kazdin (Ed.), *Methodological issues and strategies in clinical research* (4th ed., pp. 187–203). American Psychological Association. <https://doi.org/10.1037/14805-012>.
- Connelly, L. M. (2022). Measurement instrument validity. *Medsurg Nursing*, 31(1), 63–64.
- Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical assessment, research, and evaluation*, 10(1). <https://doi.org/10.7275/jyj1-4868>
- Cranley, M. S. (1981). Development of a tool for the measurement of maternal attachment during pregnancy. *Nursing Research*, 30(5), 281–284, September 1981.
- da Rosa, K. M., Scholl, C. C., Ferreira, L. A., Trettim, J. P., da Cunha, G. K., Rubin, B. B., da Luz Martins, R., dos Santos Motta, J. V., Fogaça, T. B., & Ghisleni, G. (2021). Maternal-fetal attachment and perceived parental bonds of pregnant women. *Early Human Development*, 154, <https://doi.org/10.1016/j.earlhumdev.2021.105310>.
- DeVellis, R. F., & Thorpe, C. T. (2021). *Scale development: Theory and applications*. Sage publications. https://www.columbusstate.edu/academic-affairs/_docs/eduf_syllabus.pdf
- Field, A. (2024). *Discovering statistics using IBM SPSS statistics*. Sage publications limited. <https://vlb-content.vorarlberg.at/fhbscan1/330900091084.pdf>
- Gobel, F. A. (2020). Effect of video and lecture methods on personal hygiene and dental health status of primary school students in West Sinjai District, Sinjai Regency, 2019. *Jurnal Mitrasehat*, 74–85.
- Golbasi, Z., Ucar, T., & Tugut, N. (2015). Validity and reliability of the Turkish version of the Maternal Antenatal Attachment Scale. *Japan Journal of Nursing Science*, 12(2), 154–161. <https://doi.org/10.1111/jjns.12052>
- Gonzales Jr, A. M., & Barcelo, T. I. (2023). Quality of prenatal care and maternal fetal attachment among primigravid mothers in the Philippines: A cross sectional study. *Midwifery*, 127, <https://doi.org/10.1016/j.midw.2023.103842>
- Herwansyah, H., Czabanowska, K., Kalaitzi, S., & Schröder-Bäck, P. (2022). The utilization of maternal health services at primary healthcare setting in Southeast Asian Countries: A systematic review of the literature. *Sexual & Reproductive Healthcare*, 32, <https://doi.org/10.1016/j.srhc.2022.100726>
- Hudson, P., Hagedoorn, L., & Bubeck, P. (2020). Potential linkages between social capital, flood risk perceptions, and self-efficacy. *International Journal of Disaster Risk Science*, 11(3), 251–262. <https://doi.org/10.1007/s13753-020-00259-w>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20(1), 141–151. <https://doi.org/10.1177/001316446002000116>
- Kamarudin, S. S., Idris, I. B., Ahmad, N., & Sharip, S. (2024). Exploring Asian maternal experiences and mHealth needs for postpartum mental health care. *Digital Health*, 10, <https://doi.org/10.1177/20552076241292679>
- Kline, R. B. (1999). Book review: Psychometric theory. *Journal of Psychoeducational Assessment*, 17(3), 275–280. <https://doi.org/10.1177/073428299901700307>
- Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford publications. <https://journals.library.ualberta.ca/csp/index.php/csp/article/download/29418/21439>
- Kołomańska-Bogucka, D., Micek, A., & Mazur-Bialy,

- A. I. (2022). The COVID-19 pandemic and levels of physical activity in the last trimester, life satisfaction and perceived stress in late pregnancy and in the early puerperium. *International journal of environmental research and public health*, 19(5), 3066. <https://doi.org/10.3390/ijerph19053066>
- Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine*, 15(2), 155–163. <https://doi.org/10.1016/j.jcm.2016.02.012>
- Lima, C. de A., Brito, M. F. S. F., Pinho, L. de, Andrade, J. S., Santos, V. M., Marôco, J., & Silveira, M. F. (2024). Psychometric evaluation of the Brazilian version of the Maternal-Fetal Attachment Scale. *Estudos de Psicologia (Campinas)*, 41, e210144. <https://doi.org/10.1590/1982-0275202441e210144>
- Lima, C. de A., Brito, M. F. S. F., Pinho, L. de, Leão, G. M. M. S., Ruas, S. J. S., & Silveira, M. F. (2022). Abbreviated version of the Maternal-Fetal Attachment Scale: Evidence of validity and reliability. *Paidéia (Ribeirão Preto)*, 32, e3233. <https://doi.org/10.1590/1982-4327e3233>
- McNamara, J., Townsend, M. L., & Herbert, J. S. (2019a). A systemic review of maternal wellbeing and its relationship with maternal fetal attachment and early postpartum bonding. *PloS One*, 14(7), <https://doi.org/10.1371/journal.pone.0220032>
- World Health Organization. (2020). Ending childhood dental caries: WHO implementation manual. World Health Organization.
- Polit, D. F., & Beck, C. T. (2006). The content validity index: are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health*, 29(5), 489–497. <https://doi.org/10.1002/nur.20147>
- Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health*, 30(4), 459–467. <https://doi.org/10.1002/nur.20199>
- Posada, G. E., Trumbell, J. M., Lu, T., & Kaloustian, G. (2018). III. The organization of attachment behavior in early childhood: Links with maternal sensitivity and child attachment representations. *Monographs of the Society for Research in Child Development*, 83(4), 35–59. <https://doi.org/10.1111/mono.12390>
- Røhder, K., Væver, M. S., Aarestrup, A. K., Jacobsen, R. K., Smith-Nielsen, J., & Schiøtz, M. L. (2020). Maternal-fetal bonding among pregnant women at psychosocial risk: The roles of adult attachment style, prenatal parental reflective functioning, and depressive symptoms. *PloS One*, 15(9), <https://doi.org/10.1371/journal.pone.0239208>
- Rossen, L., Hutchinson, D., Wilson, J., Burns, L., Allsop, S., Elliott, E. J., Jacobs, S., Macdonald, J. A., Olsson, C., & Mattick, R. P. (2017). Maternal bonding through pregnancy and postnatal: Findings from an Australian longitudinal study. *American Journal of Perinatology*, 34(08), 808–817. <https://doi.org/10.1055/s-0037-1599052>
- Sacchi, C., Miscioscia, M., Visentin, S., & Simonelli, A. (2021a). Maternal–fetal attachment in pregnant Italian women: multidimensional influences and the association with maternal caregiving in the infant's first year of life. *BMC Pregnancy and Childbirth*, 21, 1–8. <https://doi.org/10.1186/s12884-021-03964-6>
- Shieh, D., Li, Q., Shi, J. M., & Tovar, S. (2021). The Shieh Score as a risk assessment tool for hospital-acquired pressure injuries: a retrospective cohort study. *Advances in Skin & Wound Care*, 34(3), 132–138. <https://doi.org/10.1097/01.ASW.0000732736.89356.cb>
- Sousa, V. D., & Rojjanasrirat, W. (2011). Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. *Journal of Evaluation in Clinical Practice*, 17(2), 268–274. <https://doi.org/10.1111/j.1365-2753.2010.01434.x>
- Suryaningsih, E. K., Gau, M.-L., & Wantonoro, W. (2020). Concept analysis of maternal-fetal attachment. *Belitung Nursing Journal*, 6(5), 157–164. <https://doi.org/10.33546/bnj.1194>
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). Using multivariate statistics (Vol. 5, pp. 481–498). Boston, MA: pearson. <https://www.pearsonhighered.com/assets/preface/0/1/3/4/0134790545.pdf>
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53. <https://doi.org/10.5116/ijme.4dfb.8dfd>
- Trombetta, T., Giordano, M., Santoniccolo, F., Vismara, L., Della Vedova, A. M., & Rollè, L. (2021). Pre-natal attachment and parent-to-infant attachment: A systematic review. *Frontiers in Psychology*, 12, <https://doi.org/10.3389/fpsyg.2021.620942>
- Worthington, R. L., & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. *The Counseling Psychologist*, 34(6), 806–838. <https://doi.org/10.1177/0011000006288127>

Social capital and community disaster resilience in a disaster-prone area in Indonesia

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Abstract

Background: Communities in disaster-prone areas face repeated exposure to natural hazards, yet the role of social capital in enhancing disaster resilience is underexplored in Indonesia.

Purpose: This study aimed to examine the relationship between dimensions of social capital—social cohesion, social participation, and reciprocity—and community disaster resilience in Sukabumi, West Java.

Methods: A cross-sectional survey was conducted among 700 residents aged ≥18 years using an online questionnaire. Disaster resilience was measured with the Brief Resilience Scale, and social capital with validated subscales. Multiple linear regression analyzed associations between social capital and resilience.

Results: Older age, higher education, experience of housing damage (22.4%), loss of friends or relatives (44.6%), and higher levels of social cohesion, participation, and reciprocity were significantly associated with greater disaster resilience (all $p < 0.05$). The regression model explained 56% of the variance ($R^2 = 0.56$).

Conclusions: Social capital is a significant predictor of community disaster resilience in high-risk areas. These findings can guide health professionals, especially nurses, to design targeted interventions for disaster preparedness and long-term recovery.

Keywords: community resilience; Indonesia; natural disasters; social capital; social cohesion

Introduction

A disaster disrupts a community, causing widespread losses, societal disruption, and damage that exceeds the community's capacity to manage its resources (World Health Organization, 2019). World Health Organization reports 190 million people affected by natural catastrophes annually (Girardet, 2020). Indonesia experienced 3,350 natural catastrophes in 2022, causing 5,143,027 fatalities, over 1,000 deaths, and a total economic loss of 1,34 trillion Rupiah. These disasters included extreme weather, landslides, fires, earthquakes, and volcano eruptions (Bencana, 2020). However, large-scale disasters often lead to extensive destruction of homes and the migration of populations, resulting in the separation of neighborhoods (Rumpa et al., 2023). Maintaining social relationships after disasters is challenging (Lee et al., 2022).

Social capital is crucial for community disaster recovery and coping (Gallagher et al., 2019; Masud-All-Kamal & Monirul Hassan, 2018; Wei & Han, 2018). The disaster hazards cycle paradigm consists of four phases: mitigation, preparedness, response, and recovery (Tierney, 2019). Social capital plays a crucial role in each phase. At the mitigation stage, communities can take preventative measures like enforcing earthquake-resistant building rules (Lee et al., 2022). Social capital refers to the quantity and quality of social connections in a community, consisting of two dimensions: cognitive (regarding perceived social relations) and structural (regarding actual actions

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in social networks). Cognitive dimensions involve residents' perceptions of social relations, while structural dimensions involve their actual actions in their social networks, such as friends, organizations, and social events (Carrillo Álvarez & Riera Romani, 2017). Social capital is a complex concept with various frameworks defining its measurable parts. Aldrich and Meyer (Saito et al., 2017) propose a framework consisting of bonding, bridging, and linking types of social capital for a comprehensive and grounded theory. However, health outcomes following a disaster may be impacted by a community's amount of social capital. Thus, in order to avert disasters and be ready for them, it is crucial to strengthen social ties within the community.

Resilience is a crucial aspect of human survival after natural disasters, as it helps individuals recover more quickly (Jewett et al., 2021; Laurence & Kim, 2021). Communities with high levels of trust and mutual aid fare better after natural disasters (Saito et al., 2017). Increased cooperative activities, prioritizing group interests over individual interests, are believed to drive this recovery (Ntontis et al., 2008). Resilience is linked to various types of unexpected catastrophes, both natural and man-made (Saito et al., 2017; Rumpa et al., 2023). All humans have the potential for resilience, but their actual degrees are influenced by environmental and personal factors (Vella & Pai, 2019). Protective elements, such as skills and abilities, have been found to bolster resilience (Friedberg & Malefakis, 2022). Resilience, sometimes called psychological resilience or psychological hardiness, is traditionally defined as the capacity to overcome hardship. In the aftermath of a crisis, a resilient community will be one that has established a positive trajectory of functioning and adaptation among its constituent populations through a set of interconnected adaptive skills (Ntontis et al., 2020). A dearth of research on the relationship between social capital and community resilience to disasters has been identified in Indonesia. Community members in Indonesian disaster-prone areas were the focus of this study, which sought to investigate the link between social capital and catastrophe resilience.

Materials and Methods

Study design

A cross-sectional study was conducted in Sukabumi, West Java, Indonesia. Participants were residents aged ≥ 18 years who completed an online questionnaire. Disaster resilience was measured using the Brief Resilience Scale, while social capital was assessed through validated subscales for social cohesion, social participation, and reciprocity. Associations between social capital and resilience were analyzed using multiple linear regression.

Sample

Participants were residents of West Java, Indonesia, aged 18 years or older and fluent in Bahasa

Indonesia. Inclusion criteria required participants to have lived in the community for at least one year and to provide informed consent for participation. Individuals who were unable to complete the online questionnaire independently or lacked internet access were excluded.

A minimum sample size of 664 was calculated to achieve a 95% confidence level and a 5% margin of error based on the total population of West Java. A total of 700 participants were recruited using convenience sampling through social media platforms such as Facebook and Instagram. Although the sample size was statistically sufficient, the convenience sampling method limits the generalizability of the findings. Conducting the survey online introduced selection bias, as only participants with internet access and digital literacy could participate, which may reduce external validity. Additionally, the cross-sectional design allows for identification of associations between social capital and disaster resilience but does not support causal inferences.

Instruments

Sociodemographic variables considered potential confounders included sex, age, monthly income, education, and years of community residence. Participants were also asked about personal disaster experiences, including loss of friends or relatives and housing damage.

Resilience was measured using the Brief Resilience Scale (BRS) developed by Tierney (2019) which assesses the ability to "bounce back" from stress using six items rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The BRS was translated and culturally adapted for the Indonesian context following standard forward-backward translation procedures. In this study, it demonstrated good internal consistency (Cronbach's $\alpha = 0.87$).

Social capital was measured based on three dimensions: social cohesion, social participation, and reciprocity (Saito et al., 2017).

Social cohesion assessed trust, mutual aid, and sense of belonging within the community using three items rated on a 5-point Likert scale (1 = not at all, 5 = strongly agree; Cronbach's $\alpha = 0.81$).

Social participation was measured by three items asking frequency of engagement in sports clubs, hobby groups, and volunteer activities. Each item was scored 0–1 (0 = not participating, 1 = participating regularly), with the total score ranging from 0–3 (Cronbach's $\alpha = 0.83$).

Reciprocity was measured using four yes/no items on mutual support and emotional care. Each "yes" was scored 1, summed to yield a total score of 0–3 (Cronbach's $\alpha = 0.81$).

Individual-level social capital scores were aggregated to the community level by averaging participants' scores within the same community. Higher scores indicate greater social cohesion, participation, and reciprocity (Nakagomi et al.,

Table 1. Descriptive statistics for variables (n=700)

Variables	Min–Max	Mean (SD)
Demographic factors		
Age	18–45	30.3 (7.45)
Gender		
Male		410 (58.6)
Female		290 (41.4)
Duration of residence (years)	1–32	26.71 (21.98)
Education	1–8	
Below senior high school		380 (54.3)
Senior high school		320 (45.7)
Monthly income (USD)		1.66 (0.88)
Disaster personal experience		
Housing damage		
Yes		157 (22.4)
No		543 (77.6)
Losing friends or relatives		
Yes		312 (44.6)
No		388 (55.4)
Community-level social capital	0–3	2.71 (0.48)
Social capital indicators		
Social cohesion	0–3	2.57 (0.87)
Social participation	0–3	2.01 (1.03)
Reciprocity	0–3	2.71 (0.14)
Resilience	1–5	3.56 (1.15)

2019).

Procedure

The study protocol was approved by the Institutional Review Board of STIKes Sukabumi (Approval No.: 0987/ETIK/2022). Data were collected through an online survey conducted in September and October 2022 using a secure internet survey platform. Participants were recruited via social media networks, including Facebook and Instagram groups. Informed consent was obtained electronically before participants completed the self-administered questionnaire.

Results

Of the 700 respondents who completed the online questionnaire (25 had missing data), 58.6% were male and 41.4% were female. Most participants (54.3%) had education below senior high school. The mean age was 30.3 years (SD = 7.45), the mean duration of residence was 26.71 years (SD = 21.98), and the average monthly income was USD 1.66 (SD = 0.88). Approximately 22.4% of respondents had experienced housing damage due to disasters, and 44.6% had lost friends or relatives.

The mean community-level social capital score was 2.71 (SD = 0.48). Subscale means indicated

moderate levels: social cohesion 2.57 (SD = 0.87), social participation 2.01 (SD = 1.03), and reciprocity 2.71 (SD = 0.14).

Bivariate correlations (Table 2) showed that disaster resilience was positively associated with age ($r = 0.20$), years of education ($r = 0.34$), monthly income ($r = 0.17$), social cohesion ($r = 0.62$), social participation ($r = 0.57$), and reciprocity ($r = 0.61$), all $p < 0.05$. Experience of housing damage ($r = -0.25$) and loss of friends or relatives ($r = -0.31$) were negatively associated with disaster resilience.

Multiple linear regression indicated that older age, higher education, experience of housing damage, loss of friends or relatives, social cohesion, social participation, and reciprocity were significant predictors of disaster resilience (all $p < 0.05$). The model explained 56% of the variance ($R^2 = 0.56$).

Discussion

This study supports existing literature suggesting a positive association between social capital—including social cohesion, social participation, and reciprocity—and community disaster resilience, consistent with previous findings (Lee et al., 2018). Cohesive communities foster trust, mutual aid, and self-organization during disasters, enabling residents to support each other and reducing the

Table 2. Correlations among study variables

	1	2	3	4	5	6	7	8	9	10	11
Age	1										
Gender		1									
Duration of residence (years)	0.01	0.08	1								
Education	0.09	0.03	0.07	1							
monthly income (USD)	0.06	0.10	0.18*	0.13	1						
Housing damage	0.04	0.05	0.01	0.02	0.04	1					
Losing friends or relatives	0.08	0.03	0.04	0.11	0.02	0.01	1				
Social cohesion	0.12	0.11	0.15**	0.06	0.10	0.17*	0.23**	1			
Social participation	0.18*	0.22**	0.31**	0.10	0.07	0.21**	0.32**	0.45***	1		
Reciprocity	0.19*	0.17*	0.26**	0.12	0.02	0.25**	0.29**	0.53**	0.58***	1	
Resilience	0.20*	0.11	0.34***	0.17*	0.03	-0.25**	-0.31***	0.62***	0.57***	0.61***	1

Note: *p < .05. **p < .01. ***p < .001.

Table 3. Factors associated with disaster resilience (n = 700)

Significant Factors	Unstandardized Beta (SE)	p value	Adjusted R2
Age	0.24 (0.03)	0.011	0.56
Duration of residence (years)	0.27 (0.11)	0.015	
Education	0.31 (0.09)	0.021	
Housing damage	0.21 (0.04)	0.001	
Losing friends or relatives	0.32 (0.15)	0.002	
Social cohesion	0.41 (0.17)	0.001	
Social participation	0.44 (0.10)	0.001	
Reciprocity	0.24 (0.13)	0.011	

burden on government services (Reicher & Stott, 2020; Boyd & Davis, 2021; Drury et al., 2021). Communities with higher social cohesion also distribute coping resources, both monetary and emotional, more effectively, which can reduce negative health outcomes during crises (Reicher & Stott, 2020).

The present study demonstrated that individuals' perceptions of social cohesion and access to social capital strengthened resilience after experiencing disaster-related losses. While disaster damage increased the risk of functional decline, pre-existing community social capital mitigated these effects. Local factors such as small group size, past collaboration, shared livelihood resources, and engagement in recovery activities—like clearing debris, providing medical care, securing relief,

and offering psychological support—contributed to the recovery of normal life in Sukabumi, West Jav (Casas-Quiroga & Crujeiras-Pérez, 2020).

Consistent with Graves's classic study (Graves, 2010), is placement and loss of community ties can exacerbate collective trauma, highlighting the importance of maintaining social networks in post-disaster recovery. Disaster experiences, such as housing damage or loss of loved ones, also shaped resilience, possibly by reinforcing social participation and reciprocity within affected communities.

These findings indicate that social capital plays a critical role in both individual and community resilience, facilitating cooperation beyond self-interested survival behaviors. Future research should examine how local contexts influence the mechanisms through which social capital supports

disaster recovery (Aldrich & Meyer, 2015).

Study limitation

Several limitations should be considered when interpreting these findings. First, the cross-sectional design precludes causal inferences, and the observed associations may reflect reverse or reciprocal relationships. Longitudinal studies are needed to clarify the mechanisms linking social capital and disaster resilience.

Second, this study focused on structural social capital (social cohesion, social participation, and reciprocity) and did not examine cognitive aspects, such as shared norms and trust. Future research should include both structural and cognitive components to provide a more comprehensive understanding of how social capital contributes to community resilience.

Finally, the measure of disaster resilience may not fully capture its complex psychological dimensions. Future studies should employ instruments that more accurately reflect the multidimensional nature of resilience in disaster-affected populations.

Implications for Practice

The findings highlight the importance of social capital in supporting community disaster resilience and long-term recovery from repeated catastrophes. Nurses and other health professionals can use insights from the relationships between social capital and resilience to assess and support individuals in disaster-prone communities.

The Brief Resilience Scale (BRS) and social capital measures used in this study were translated, culturally adapted, and validated for the Indonesian context, ensuring their reliability and construct validity. Incorporating these instruments into practice may allow practitioners to systematically evaluate resilience and social capital among affected populations.

Furthermore, nurses may benefit from targeted training on resilience and social capital to develop interventions that strengthen community networks and coping capacities. Enhancing these factors can help reduce stress, depression, and other adverse mental health outcomes, ultimately fostering more resilient communities.

Conclusion

This study demonstrated a significant positive association between social capital—comprising social cohesion, social participation, and reciprocity—and community disaster resilience in West Java, Indonesia. Individuals and communities with higher social capital were better able to cope with the adverse effects of disasters, while experiences of housing damage or loss of relatives negatively affected resilience. These findings underscore the theoretical importance of social capital as a protective factor in disaster contexts and highlight the need to consider both structural and cognitive

dimensions in resilience research.

From a practical perspective, enhancing social capital within disaster-prone communities can strengthen collective coping mechanisms and reduce long-term psychological and social impacts. Health professionals, especially nurses, can integrate assessments of resilience and social capital into community-based interventions to foster preparedness and recovery. Future research should employ longitudinal designs and culturally adapted measures to further clarify the mechanisms through which social capital influences resilience over time.

Declaration of Interest

The authors declare no conflict of interest.

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Data Availability

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

References

- Aldrich, D. P., & Meyer, M. A. (2015). Social capital and community resilience. *American Behavioral Scientist*, 59(2), 254–269. <https://doi.org/10.1177/0002764214550299>
- Bencana, B. N. P. (2020). Annual report. BNPB.
- Boyd, N., & Davis, M. (2021). Neighbors help in a pandemic. *Erasmus Journal for Philosophy and Economics*, 14(1), 33–46. <https://doi.org/10.23941/ejpe.v14i1.558>
- Carrillo Álvarez, E., & Riera Romani, J. (2017). Measuring social capital: further insights. *Gaceta Sanitaria*, 31, 57–61. <https://doi.org/10.1016/j.gaceta.2016.09.002>
- Casas-Quiroga, L., & Crujeiras-Pérez, B. (2020). Epistemic operations performed by high school students in an argumentation and decision-making context: Setrocia's alimentary emergency. *International Journal of Science Education*, 42(16), 2653–2673. <https://doi.org/10.1080/09500693.2020.1824300>
- Drury, J., Carter, H., Ntontis, E., & Guven, S. T. (2021). Public behaviour in response to the COVID-19 pandemic: understanding the role of group processes. *BJPsych Open*, 7(1), e11. <https://doi.org/10.1192/bjo.2020.139>
- Erikson, K. (1976). Everything in its path. Simon and Schuster.
- Friedberg, A., & Malefakis, D. (2022). Resilience, trauma, and coping. *Psychodynamic Psychiatry*, 50(2), 382–409. <https://doi.org/10.1521/pdps.2022.50.2.382>
- Gallagher, H. C., Block, K., Gibbs, L., Forbes, D.,

- Lusher, D., Molyneaux, R., Richardson, J., Pattison, P., MacDougall, C., & Bryant, R. A. (2019). The effect of group involvement on post-disaster mental health: A longitudinal multilevel analysis. *Social Science & Medicine*, 220, 167–175. <https://doi.org/10.1016/j.socscimed.2018.11.006>
- Girardet, L. H. (2020). United nations office for disaster risk reduction (undrr).
- Graves, J. B. (2010). Cultural democracy: The arts, community, and the public purpose. University of Illinois Press.
- Jewett, R. L., Mah, S. M., Howell, N., & Larsen, M. M. (2021). Social cohesion and community resilience during COVID-19 and pandemics: A rapid scoping review to inform the United Nations research roadmap for COVID-19 recovery. *International Journal of Health Services*, 51(3), 325–336. <https://doi.org/10.1177/0020731421997092>
- Laurence, J., & Kim, H. H. (2021). Individual and community social capital, mobility restrictions, and psychological distress during the COVID-19 pandemic: A multilevel analysis of a representative US survey. *Social Science & Medicine*, 287, 114361. <https://doi.org/10.1016/j.socscimed.2021.114361>
- Lee, J., Aldrich, D. P., Kiyota, E., Yasuhiro, T., & Sawada, Y. (2022). Social capital building interventions and self-reported post-disaster recovery in Ofunato, Japan. *Scientific Reports*, 12(1), 10274. <https://doi.org/10.1038/s41598-022-14537-8>
- Masud-Ali-Kamal, M., & Monirul Hassan, S. M. (2018). The link between social capital and disaster recovery: evidence from coastal communities in Bangladesh. *Natural Hazards*, 93, 1547–1564. <https://doi.org/10.1007/s11069-018-3367-z>
- Nakagomi, A., Tsuji, T., Hanazato, M., Kobayashi, Y., & Kondo, K. (2019). Association between community-level social participation and self-reported hypertension in older Japanese: a JAGES multilevel cross-sectional study. *American Journal of Hypertension*, 32(5), 503–514. <https://doi.org/10.1093/ajh/hpz028>
- Ntontis, E., Drury, J., Amlôt, R., Rubin, G. J., & Williams, R. (2020). What lies beyond social capital? The role of social psychology in building community resilience to climate change. *Traumatology*, 26(3), 253. <https://psycnet.apa.org/doi/10.1037/trm0000221>
- Reicher, S., & Stott, C. (2020). On order and disorder during the COVID-19 pandemic. *British Journal of Social Psychology*, 59(3), 694–702. <https://doi.org/10.1111/bjso.12398>
- Rumpa, N. T., Real, H. R. K., & Razi, M. A. (2023). Disaster risk reduction in Bangladesh: A comparison of three major floods for assessing progress towards resilience. *International Journal of Disaster Risk Reduction*, 97, <https://doi.org/10.1016/j.ijdrr.2023.104047>
- Saito, M., Kondo, N., Aida, J., Kawachi, I., Koyama, S., Ojima, T., & Kondo, K. (2017). Development of an instrument for community-level health related social capital among Japanese older people: The JAGES Project. *Journal of Epidemiology*, 27(5), 221–227. <https://doi.org/10.1016/j.je.2016.06.005>
- Tierney, K. (2025). Disasters: A sociological approach. John Wiley & Sons.
- Vella, S.-L. C., & Pai, N. B. (2019). A theoretical review of psychological resilience: Defining resilience and resilience research over the decades. *Archives of Medicine and Health Sciences*, 7(2), 233–239. https://doi.org/10.4103/amhs.amhs_119_19
- Wei, J., & Han, Y. (2018). Pre-disaster social capital and disaster recovery in Wenchuan earthquake-stricken rural communities. *Sustainability*, 10(6), <https://doi.org/10.3390/su10062046>
- WHO. (2019). Health emergency and disaster risk management framework.

The influence of family function and resilience to self-efficacy and self-esteem mediating by family role in breast cancer patients: A PLS-SEM

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Abstract

Background: Breast cancer is known as one of the most dangerous types of cancer in the world. Managing self-efficacy and self-esteem in breast cancer patients presents a major challenge.

Purpose: This study aims to analyze the influence of family function and family resilience on self-efficacy and self-esteem in breast cancer patients by positioning family role as a mediator variable in a structural model based on the Family Centered Empowerment Model.

Methods: This study used a cross-sectional design. The population consists of breast cancer patients, with a sample size of 102 respondents using total sampling. The independent variables are family functioning and resilience, while the dependent variables are self-efficacy and self-esteem, with family role as the intervening variable. The inferential analysis used was Structural Equation Modelling Partial Least Squares by evaluating the measurement model (outer model), evaluating the structural model (inner model), and testing hypotheses.

Results: Family function and family resilience significantly predicted family role ($p = 0.007$) and ($p = 0.012$), respectively. Family role, in turn, significantly predicted self-efficacy ($p < 0.001$) and self-esteem ($p < 0.001$). The model explained 30.8% of the variance in family role, 52.6% in self-efficacy, and 29.2% in self-esteem.

Conclusion: Family function and family resilience significantly influence family role, which subsequently predicts self-efficacy and self-esteem among breast cancer patients. Longitudinal studies are warranted to further clarify causal pathways and validate the stability of this structural model.

Keywords: breast cancer; family centered empowerment model; family role; self-efficacy; self-esteem

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Introduction

Since ancient times, breast cancer has been known as one of the most dangerous types of cancer in the world. This is in line with the data attached by the Breast Cancer Research Foundation in 2022, which reached 2.2 million, more than 670,000 of those cases resulting in death (BCRF, 2023). The World Cancer Research Fund also reported that China ranks first in new cancer cases among women with 357,161 cases, followed by the United States with 274,375 cases, India with 192,020 cases, and Brazil and Japan with 94,728 and 91,916 cases, respectively (WCRF, 2022). Breast cancer in Indonesia is also the most common new cancer case among women, with 66,271 cases and 22,598 deaths in 2022. This figure places Indonesia eighth in the world.

Breast cancer, or Carcinoma Mammariae, is a malignant tumor in the form of an abnormal lump that grows in breast tissue. Tumor growth can occur in the mammary glands, glandular ducts, and supporting breast tissue such as fatty tissue and connective tissue (Iqmy et al., 2021). The exact cause of breast cancer is unknown, but a number of risk factors have been identified, namely modifiable and non-modifiable factors. Non-modifiable factors include age, genetics, reproductive history, and exposure to ionizing

radiation at a young age. Modifiable factors include poor diet, obesity, hormonal contraceptive use, alcohol consumption, and hormone replacement therapy (Smolarz et al., 2022).

Breast cancer generally does not show symptoms in the early stages, but lumps are the most common physical symptom. Other less common symptoms may include discomfort or heaviness in the breast, permanent changes in the nipple, such as the nipple becoming detached (especially if it bleeds), scaly skin, or inward pulling (retraction) of the nipple (Alkareem et al., 2023). Breast cancer management is carried out in a multidisciplinary manner by combining locoregional therapies such as surgery and radiotherapy, as well as systemic therapies. Systemic therapies include hormone administration in cases with positive hormone receptors, chemotherapy, anti-HER2 targeted therapy in cancers with positive HER2 expression, and in recent developments also include the use of immunotherapy (Smolarz et al., 2022).

Given the dangerous nature of this disease and the complexity of the treatment required, including chemotherapy, breast cancer patients often exhibit negative psychological responses in their daily lives and in the long term, including decreased self-efficacy and self-esteem (Dewi et al., 2023; Haris et al., 2024). Breast cancer patients tend to have low self-efficacy and self-esteem due to poor mental adjustment caused by the effects of treatment, uncertainty regarding the healing process, and physical changes resulting from breast cancer. As a result, breast cancer patients often experience obstacles in achieving self-care goals and difficulty adapting to their illness (Ali et al., 2020; Dewi et al., 2022; Tsai et al., 2021; Wulandari et al., 2024).

Managing self-esteem and self-efficacy in breast cancer patients presents a major challenge. To date, there is no universal therapy that is effective in addressing the long-term effects. Therefore, the role of the family becomes an alternative option for addressing this issue (Shi & Wu, 2023).

In the context of collective cultures such as families in Indonesia, the role of the family is a major source of support and has the potential to strengthen patients' adaptive mechanisms. The Family Centered Empowerment Model (FCEM) framework emphasizes that the components of family function and family resilience together form the operational role of the family in providing educational support, supervision, motivation, role modeling, friendship, and counseling to patients. This role is expected to increase patients' self-efficacy and self-esteem (Abedini et al., 2020; Shoghi et al., 2019). Preliminary empirical evidence indicates a relationship between family function, family resilience, and patients' psychosocial outcomes, but studies modeling the latent relationships between these three constructs and psychological outcomes in breast cancer patients are still limited (Alhani et al., 2022; Alzawahreh & Ozturk, 2024).

The role of the family can increase self-esteem

and self-efficacy through improved physical and mental functioning and self-capacity. The main thing in enhancing the role of the family is to pay attention to the role of family functioning and family resilience, so that it can help optimize the role of the family in dealing with difficult situations (Shoghi et al., 2019). Family function and resilience are determining factors in maximizing the roles played by family members as a foundation that strengthens relationships between family members. Family roles based on family function and strong family resilience can provide more active and appropriate support. This increases the chances of resolving self-esteem and self-efficacy issues in breast cancer patients (Cui et al., 2024).

Although various studies have identified the relationship between family outcome (such as family role, function or relationship) and psychological outcomes in breast cancer patients (Chang et al., 2022; Niveau et al., 2021; Seifyfard et al., 2025), few studies have simultaneously modeled family functioning and family resilience as exogenous constructs that influence self-efficacy and self-esteem through the role of family as a mediator in a theory-based structural framework. The novelty of this study lies in the development of a structural model that simultaneously positions family function and family resilience as exogenous constructs that influence self-efficacy and self-esteem through family role as a mediator in a Structural Equation Modeling-based analytical framework. Furthermore, this study expands the application of the Family Centered Empowerment Model by using it as a conceptual foundation to map the psychosocial mechanisms of families of adult breast cancer patients, which have previously been studied more in the context of caregiver interventions or pediatric populations.

This study aims to analyze the influence of family function and family resilience on self-efficacy and self-esteem in breast cancer patients by positioning family role as a mediator variable in a structural model based on the Family Centered Empowerment Model.

Materials and Methods

Design

This study employed a cross-sectional design to examine the structural relationships among family function, family resilience, family role, self-efficacy, and self-esteem in breast cancer patients. The Family Centered Empowerment Model (FCEM) was used as a conceptual framework to formulate the hypothesized structural relationships among the constructs, rather than as a measurement instrument.

Sample and setting

This study was conducted at a hospital in Sukabumi Regency, West Java, Indonesia. The inclusion criteria for this study were patients who could

Table 1. Distribution of characteristics breast cancer patient

Characteristics	Frequency	Percentage (%)
Age (Years)		
18-40	15	14.7
41-60	70	68.6
> 60	17	16.7
Education		
Elementary School	34	33.3
Junior High School	24	23.5
Senior High School	33	32.4
Higher Education	11	10.8
Marital Status		
Married	81	79.4
Widow or Widower	21	20.6
Employment Status		
Working	13	12.7
Not Working	89	87.3
Long-term Breast Cancer Sufferer		
< 6 months	22	21.6
6 months – 2 years	53	52.0
3-5 years	16	15.6
>5 years	11	10.8
Long-term Chemotherapy		
< 6 months	67	65.7
6 months – 2 years	30	29.4
3-5 years	4	3.9
>5 years	1	1.0

communicate verbally, patients who were willing to participate as respondents, and breast cancer patients undergoing their first cycle of chemotherapy. The population consists of breast cancer patients, with a sample size of 102 respondents using total sampling.

Variable

In this study, there are three independent variables, namely Family Functioning and Family Resilience with Family Role Factors as intervening variable which act as causes or influencing factors. The dependent variables are Self-Efficacy and Self-Esteem, which are the outcomes or effects of these independent variables. SEM allows researchers to understand and measure the cause-and-effect relationships among these variables in one model, including both direct and indirect effects, while accounting for measurement errors in the data.

Instruments

The tools used in this study included questionnaires adapted from various validated sources. The family function questionnaire was adapted from

Indonesian National Population and Family Planning Agency (BKKBN), the validity and reliability test results showed that all item loadings were > 0.70, AVE = 0.783, composite reliability = 0.947, and Cronbach's α = 0.93 (BKKBN, 2017). Meanwhile the family resilience questionnaire was adapted from Indonesian Ministry of Education and Culture with validity and reliability test results show that the instrument has adequate internal consistency with a Cronbach's alpha value of 0.659 and an item-total correlation coefficient ranging from 0.531 to 0.864 (Kemendikbud, 2017). Family role questionnaire based on the Parenting Sense of Competency Scale (PSOC) which demonstrated acceptable internal consistency reliability, as indicated by Cronbach's alpha coefficients of α = .85 exceeding the recommended threshold of 0.70, supporting its adequacy for measuring the intended construct (Uchiara, 2018), so that all indicators are considered sufficiently reliable and valid to measure the construct under study.

The self-efficacy questionnaire used the Symptom-Management Self-Efficacy Scale-Breast Cancer (SMSES-BC). The reliability of the SMSES-BC was indicated by a Cronbach's alpha value of

Table 2. Distribution of research variable

Variables	Indicators	Very Poor (%)		Poor (%)	Fair (%)	Good (%)	Very Good (%)
Family Function	Social Culture					81.13	
	Love and Compassion						82.72
	Protection						81.74
	Economy					78.06	
	Religion						81.86
Family Resilience	Physical					78.43	
	Social					81.13	
	Psychological					80.80	
The Role of the Family	Education						81.74
	Supervision						91.67
	Motivator						94.24
	Role Model						92.65
	Friend						89.83
	Counselor						90.56
Self-Esteem	Self-Acceptance					85.97	
	Self-Respect					77.27	
Variables	Indicators	Very Poor (%)	Poor (%)	Fair (%)	Good (%)	Very Good (%)	
Self-Efficacy	Problem Solving						85.29
	Managing Chemotherapy Symptoms					83.97	
	Managing Emotional and Interpersonal Disturbances						85.44

0.96, while each subscale ranged from 0.88 to 0.95, and content validity ranged from 0.75 to 1.00 (Semiz & Sağlam Aksüt, 2022). Meanwhile, the self-esteem questionnaire used was the Rosenberg Self-Esteem Scale (RSE). Reliability test results showed that the RSE had excellent internal consistency, with a Guttman scale reproducibility coefficient of 0.92 and a retest within two weeks yielding a correlation of 0.85-0.88. In terms of validity, the RSE has been proven to have convergent, predictive, and construct validity, and is significantly correlated with other self-esteem instruments such as the Coopersmith Self-Esteem Inventory (Rosenberg, 1979).

Data collection

Data collection was conducted quantitatively using a survey approach with total sampling of breast cancer patients undergoing their first cycle of chemotherapy at the research hospital and meeting the inclusion criteria, namely being able to communicate verbally and willing to be respondents. After obtaining ethical approval and written informed consent, respondents completed a structured questionnaire covering variables of family function, family resilience, family role, self-efficacy, and self-esteem based on patient perceptions. The questionnaire was completed in

person in the chemotherapy unit with the assistance of researchers or trained enumerators to ensure the completeness and consistency of responses.

Data analysis

The data analysis in this study utilized both descriptive and inferential analysis. Descriptive analysis was employed to examine the characteristics of the respondents and each variable. Meanwhile, inferential analysis used Structural Equation Modelling Partial Least Square, involving the evaluation of the measurement model (outer model), the structural model (inner model), and hypothesis testing.

Ethical consideration

The Ethics Committee of the Sukabumi College of Health Sciences, with number: 004082/KEP STIKES SUKABUMI/2025, has approved the ethical considerations for this study. Potential respondents first received a thorough explanation of the objectives and procedures of the study, including notification that their participation was voluntary. After understanding this information, participants who were willing to participate in the research were given a written consent form and asked to sign it as proof of their willingness without coercion.

Table 3. Factor loading of the variables

	Family Function (X1)	Family Resilience (X2)	The Role of the Family (Y1)	Self-Efficacy (Y2)	Self-Esteem (Y3)
X1.1 Social Culture	0.878				
X1.2 Love and Compassion	0.915				
X1.3 Protection	0.899				
X1.4 Economy	0.839				
X1.5 Religion	0.893				
X2.1 Physical		0.842			
X2.2 Social		0.892			
X2.3 Psychological		0.885			
Y1.1 Education			0.714		
Y1.2 Supervision			0.874		
Y1.3 Motivator			0.891		
Y1.4 Role Model			0.872		
Y1.5 Friend			0.749		
Y1.6 Counselor			0.864		
Y2.1 Problem Solving				0.742	
Y2.2 Managing Chemotherapy Symptoms				0.858	
Y2.3 Managing Emotional and Interpersonal Disturbances				0.825	
Y3.1 Self-Acceptance					0.943
Y3.2 Self-Respect					0.815

Table 4. Convergent validity, composite reliability, and cronbach alpha of the variables

Variables	AVE	Composite Reliability	Cronbach Alpha
Family Function (X1)	0.783	0.947	0.931
Family Resilience (X2)	0.762	0.906	0.844
The Role of the Family (Y1)	0.667	0.922	0.896
Self-Efficacy (Y2)	0.656	0.851	0.736
Self-Esteem (Y3)	0.776	0.873	0.729

Table 5. R² of variable

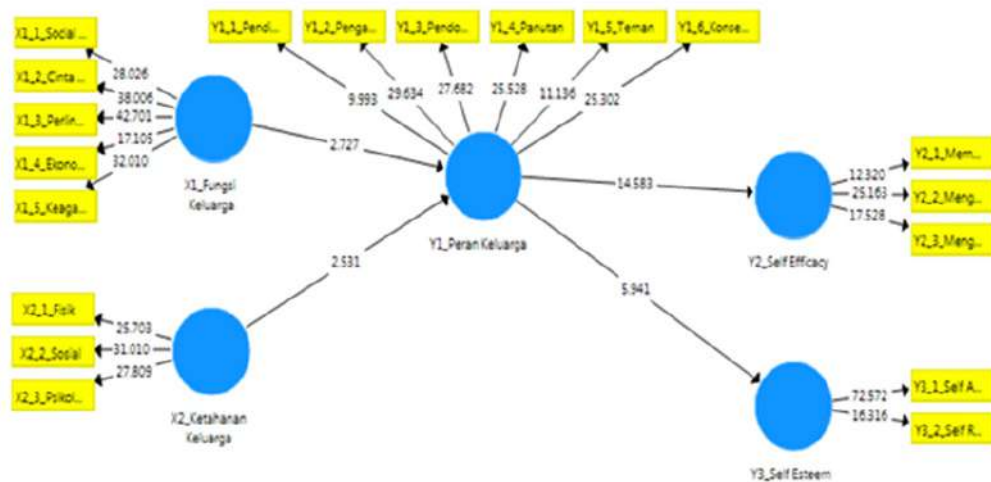
Variables	R-Square
The Role of the Family (Y1)	0.308
Self-Efficacy (Y2)	0.526
Self-Esteem (Y3)	0.292

Table 6. F² of variable

Variables	The Role of the Family (Y1)	Self-Efficacy (Y2)	Self-Esteem (Y3)
Family Function (X1)	0.081		
Family Resilience (X2)	0.055		
The Role of the Family (Y1)		1.110	0.412

Table 7. Hypothesis test results

No.	Path	Original Sample (O)	T Statistics (O/STDEV)	p
H1	Family Function → The Role of the Family	0.330	2.727	0.007
H2	Family Resilience → The Role of the Family	0.272	2.531	0.012
H3	The Role of the Family → Self-Efficacy	0.725	14.583	0.0001
H4	The Role of the Family → Self-Esteem	0.540	5.941	0.0001

**Figure 1. Determinants of Self-Efficacy and Self-Esteem in Breast Cancer Patients**

Results

Table 1 shows that most respondents were aged 41-60 years, namely 70 people (68.6%), had a high school education, namely 33 people (32.4%), were married, namely 81 people (79.4%), were unemployed, namely 89 people (87.3%), had breast cancer for 6 months – 2 years, totaling 53 people (52.0%), and undergoing chemotherapy for < 6 months, totaling 67 people (65.7%).

Table 2 shows indicators of family function dimensions, including socio-cultural (81.13%), love and affection (82.72%), protection (81.74%), economic (78.06%), and religious (81.86%). Meanwhile, indicators of the family resilience dimension include physical (78.43%), social (81.13%), and psychological (80.80%). Meanwhile, indicators of the family role dimension include education (81.74%), supervision (91.67%), encouragement (94.24%), role model (92.65%), friend (89.83%), and counselor (90.56%). Then, indicators from the self-efficacy dimension include problem solving (85.29%), managing chemotherapy symptoms (83.97%), and managing emotional and interpersonal disorders (85.44%). Furthermore, indicators from the self-esteem dimension include self-acceptance (85.97%) and self-respect (77.27%).

The outer model is analyzed by measuring its

validity and reliability, namely convergent validity and composite reliability. Convergent validity is assessed from the loading factor. This value will be accepted if the loading factor value is above 0.7. Table 3 shows the loading factor values possessed by each indicator.

Table 4 presents the results of convergent validity testing, composite reliability, and Cronbach's alpha values for each variable. Convergent validity was analyzed using the Average Variance Extracted (AVE) value, where the AVE value must be ≥ 0.5 . This means that the construct is able to explain at least 50% of the variance of its indicators (Sarstedt et al., 2021). All variables in this study showed an AVE value above 0.5. In addition, the composite reliability values for all constructs were above 0.70, while the Cronbach's alpha values were above 0.60. Thus, it can be concluded that all constructs used in this study have an adequate level of reliability.

Table 5 shows R² and communalities to evaluate the internal model. R² is also used to measure the contribution of exogenous variables to endogenous variables. The R² for family role is 0.308. This means that 30.8% of family role is influenced by family function (X1) and family resilience (X2). The R² for self-efficacy is 0.526. This means that family role factors influence self-efficacy by 52.6%. The R² value for self-esteem is 0.292, which indicates that family role contributes 29.2% to self-esteem. The

factors of family function and family resilience have a small effect size on family role. Meanwhile, family role significantly influences self-efficacy and self-esteem with a large effect size (Table 6). This model fit test is used to determine whether a model fits the data. In the model fit test, there are three test indices, namely average path coefficient (APC), average R-square (ARS), and average variance factor (AVIF). APC and ARS are accepted if the p-value is <0.05 and AVIF is less than 5. In hypothesis testing, all hypotheses showed a significant effect on the dependent variable (Table 7).

Figure 1 shows that the role of the family is influenced by family function ($t = 2.727$, path coefficient: 0.330) and family resilience ($t = 2.531$, path coefficient: 0.272). In addition, the role of the family influences self-efficacy ($t = 14.583$, path coefficient: 0.725) and self-esteem ($t = 5.941$, path coefficient: 0.540). These findings indicate that the role of the family is a dominant factor in influencing self-efficacy.

Discussion

We examined the factors that influence self-efficacy and self-esteem in breast cancer patients, including family functioning, family resilience, and family role factors. All of these variables influence self-efficacy and self-esteem, except for family functioning and family resilience. However, family functioning and family resilience are predictors of family role.

It should be emphasized that the measurement of family functioning, family resilience, and family role factors in this study was based on the perceptions of breast cancer patients as respondents, not directly from family members. Therefore, the effects found describe the relationship between patients' perceptions of family function and family resilience factors with family role, including the relationship between patients' perceptions of family role with self-efficacy and self-esteem of breast cancer patients, which are conceptually interrelated.

Although family function factors, such as socio-cultural, love and affection, protection, economic, and religious factors, do not directly affect the self-efficacy and self-esteem of breast cancer patients, research findings show a significant influence of family function on the role of the family. This indicates that although family function indicators may not directly affect self-efficacy and self-esteem, these factors are very important for maintaining the role of the family. Family function refers to the way family members work together and interact to support mutual happiness and well-being (Agustin & Kudus, 2023).

Family functions, characterized by indicators such as affection, protection, and social support, play an important role in shaping and influencing the implementation of family roles, such as education, supervision, and encouragement for family members. Optimal family functioning supports the effective implementation of family roles in

maintaining the physical, mental, and social well-being of all family members. This is supported by previous studies that reveal that family functioning enables family members and those around them to carry out their roles in providing life support for breast cancer patients with a significant impact (Lubis et al., 2020). Furthermore, research by Dewi et al. (2024) also states that poor family functioning has a negative impact on overall family well-being, especially in terms of education and care for family members. Families with poor functioning tend to experience disharmony and conflict (Yan et al., 2025), as well as poor communication (Riskika et al., 2020), which directly hinders the family's ability to fulfill its role as protector, educator, and supporter of the mental and physical well-being of its members.

The same thing is shown by family resilience factors that indirectly affect the self-efficacy and self-esteem of breast cancer patients, where research shows a significant influence of family resilience on the role of the family. This shows that even though family resilience indicators do not directly affect self-efficacy and self-esteem, these aspects still play a crucial role in maintaining the continuity and optimization of the family's role. This is in line with the collective findings of Sabah et al. (2025), which emphasize the substantial role of family resilience as a mediator, offering valuable insights into its influence on mental health, behavioral outcomes, and overall well-being, including self-efficacy and self-esteem.

Family resilience is defined as characteristics that help people resist disruption and overcome difficulties, encouraging them to adapt positively, and has been confirmed to be related to the well-being of breast cancer patients (Chang et al., 2022). Physical resilience is reflected in locomotion, vitality, and cognition, which enable the fulfillment of basic daily activity needs (Grigoraş et al., 2025), such as nutrition and comfort, so that families can perform their roles as educators and supervisors more optimally. On the other hand, strong social resilience through social support (Sumarsih et al., 2024), open communication, and harmonious relationships among family members (Zamralita et al., 2024) strengthens the family's role as motivators and friends for patients in facing emotional challenges during the treatment process. Meanwhile, psychological resilience, characterized by problem-solving skills and emotional regulation, can reduce fear and help patients cope with stress related to cancer recurrence, contributing to the maintenance of the family's role as a role model and advisor capable of providing peace of mind, advice, and moral support to patients (Cui et al., 2023; Zamralita et al., 2024). Other studies show that family resilience, defined as the ability of families to recover from stress and adapt flexibly to challenges, is very important in situations where families are able to play a role in providing significant emotional and practical support to breast cancer patients (Melguizo-Garín et al., 2023; Opsomer et al., 2022).

The results of this study indicate that family role factors significantly influence self-efficacy. This study is in line with a previous study by [Charos et al. \(2025\)](#), which states that family roles contribute significantly to the formation of self-efficacy in breast cancer patients, because effective family communication and the family's ability to solve problems can increase the patient's self-efficacy. The family is the main source of emotional and social support during treatment ([Aprilianto et al., 2021](#)).

The family acts as educators who provide understanding ([Yanni & Wijayanti, 2024](#)), supervisors who ensure therapy compliance ([Yaner et al., 2020](#)), motivators who foster motivation ([Lubis et al., 2020](#)), and role models who demonstrate coping strategies in managing illness ([Aprilianto et al., 2021](#)). In addition, families also act as friends who help increase resilience ([Ain et al., 2020](#)), as well as counselors who help patients develop adaptive coping strategies ([Udeze et al., 2025](#)). This combination of roles strengthens patients' confidence in facing the physical and psychological challenges of breast cancer, thereby increasing self-confidence and optimizing the process of adjustment to the disease ([Udeze et al., 2025](#)).

The results of the study indicate that the role of the family has a significant influence on self-esteem. These findings are in line with the statement by [Ding et al. \(2024\)](#) that an empathetic and understanding family role can encourage sufferers to feel valued and meaningful, which has a positive impact on the formation of their self-esteem. The role of the family appears to play an important role in helping patients maintain their self-esteem ([Pardede et al., 2020](#)). Patients can feel valued as individuals regardless of their physical limitations if their families accept their condition without judgment, show empathy, and provide consistent attention ([Mcdonnell et al., 2021](#)). This helps patients build a more positive self-perception and reduce feelings of inferiority or worthlessness.

The assessment of factors influencing self-efficacy and self-esteem in this study was based on the Family Centered Empowerment Model (FCEM) developed by ([Alhani et al., 2022](#)). FCEM is designed to strengthen the capacity of patients and their families by identifying key components that play a role in improving chronic disease care outcomes, in this case breast cancer. This model is based on a family-oriented care approach, which views the family as the core of the capacity building process. FCEM is implemented through four main stages. The first stage focuses on increasing knowledge. The second stage emphasizes strengthening self-efficacy, followed by the third stage, which aims to increase self-esteem. The final stage is a comprehensive evaluation of the entire series ([Alhani et al., 2022](#)). In this study, the implementation of the model was also linked to the strengthening of family functioning, family resilience,

and the role of the family as important components in supporting the process of increasing self-efficacy and self-esteem in breast cancer patients.

This study has several limitations. The use of a cross-sectional design limits the researchers' ability to draw causal conclusions between all variables, although the statistical analysis used is able to describe the direction and strength of the relationship between variables. In addition, data collection was conducted through questionnaires, which had the potential to cause response bias, as respondents may have given answers that they considered most appropriate or socially desirable. This study was also conducted in a limited setting, so the results should be generalized to a wider population with caution. Despite these limitations, this study was still able to identify family factors that contribute to increasing self-efficacy and self-esteem in breast cancer patients.

Conclusion

This study shows that family function and family resilience directly influence the role of the family and indirectly contribute to increased self-efficacy and self-esteem in breast cancer patients through the optimization of the family's role. These findings confirm that the self-efficacy and self-esteem of patients are the result of a multifactorial process, which is influenced not only by individual factors but also by the dynamics and quality of the family system. Therefore, strengthening family function and resilience is an important strategy in enhancing the role of the family so that it can provide effective support for patients. Further research is recommended to use a longitudinal design to clarify the causal relationship between variables, as well as to consider other factors such as the characteristics of individual patients and broader social support in order to enrich our understanding of the determinants of self-efficacy and self-esteem in breast cancer patients.

Declaration of Interest

The authors declare that they have no conflicts of interest.

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Data Availability

No data are associated with this article.

References

- Abedini, F., Zareiyan, A., & Alhani, F. (2020). The effects of the family-centered empowerment model on self-efficacy and self-esteem among the family caregivers of patients with prosthetic heart valve: A controlled clinical trial. *Nursing and Midwifery Studies*, 9(2), 61–67. https://doi.org/10.4103/nms.nms_45_18
- Agustin, W., & Kudus, W. A. (2023). Parental dysfunction in the formation of children's education and independence in the cidunak environment of cilegon city. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, 9(2), 4440–4449. <https://doi.org/10.36989/didaktik.v9i2.1202>
- Ain, M. Q., Triharini, M., & Kusumaningrum, T. (2020). Correlation between family support and emotional regulation with the resilience of breast cancer patients in the city of surabaya: a literature review. *Pedimatern Nursing Journal*, 6(1), 57–65. <https://doi.org/10.20473/pmnj.v6i1.19227>
- Alhani, F., Asghari-Jafarabadi, M., Norouzadeh, R., Rahimi-Bashar, F., Vahedian-Azimi, A., Jamialahmadi, T., & Sahebkar, A. (2022). The effect of family-centered empowerment model on the quality of life of adults with chronic diseases: An updated systematic review and meta-analysis. *Journal of Affective Disorders*, 316, 140–147. <https://doi.org/10.1016/j.jad.2022.07.066>
- Ali, R., Draman, N., Yusoff, S. S. M., & Norsa'adah, B. (2020). Self-efficacy for coping with breast cancer in north-eastern state of peninsular malaysia. *Asian Pacific Journal of Cancer Prevention: APJCP*, 21(10), 29–38. <https://doi.org/10.31557/APJCP.2020.21.10.2971>
- Alkareem, T. A. A., Hassan, S. A., & Abdalhadi, S. M. (2023). Breast cancer: symptoms, causes, and treatment by metal complexes: a review. *Advanced Journal of Chemistry-Section B*, 5(4), 306–319. <https://doi.org/10.48309/ajcb.2023.398122.1174>
- Alzawahreh, S., & Ozturk, C. (2024). Improving self-efficacy, quality of life, and glycemic control in adolescents with type 1 diabetes: randomized controlled trial for the evaluation of the family-centered empowerment model. *JMIR Formative Research*, 8(3). <https://doi.org/10.2196/64463>
- Aprilianto, E., Lumadi, S. A., & Handian, F. I. (2021). Family social support and the self-esteem of breast cancer patients undergoing neoadjuvant chemotherapy. *Journal of Public Health Research*, 10(2), 2234. <https://doi.org/10.4081/jphr.2021.2234>
- BCRF. (2023). Breast cancer statistics and resources. Breast Cancer Research Foundation. <https://www.bcrf.org/breast-cancer-statistics-and-resources/>
- BKKBN. (2017). Instilling and implementing character values through 8 family functions. Indonesian National Population and Family Planning Agency. <https://www.orangtuahebat.id/wp-content/uploads/2022/11/Buku-8-Fungsi-Keluarga.pdf>
- Chang, L., Zhang, S., Yan, Z., Li, C., Zhang, Q., & Li, Y. (2022). Symptom burden, family resilience, and functional exercise adherence among postoperative breast cancer patients. *Asia-Pacific Journal of Oncology Nursing*, 9(11), 100129. <https://doi.org/10.1016/j.apjon.2022.100129>
- Charos, D., Andriopoulou, M., Kyrkou, G., Deltsidou, A., Vaina, G., & Vivilaki, V. (2025). Self-efficacy in breast cancer patients: a pre – post study of a brief digital psychosocial intervention. *Diseases*, 13(7), 199. <https://doi.org/10.3390/diseases13070199>
- Cui, P., Shi, J., Li, S., Getu, M. A., Wang, R., & Chen, C. (2023). Family resilience and its influencing factors among advanced cancer patients and their family caregivers: A multilevel modeling analysis. *BMC Cancer*, 23(1), 623. <https://doi.org/10.1186/s12885-023-11101-z>
- Cui, P., Yang, M., Hu, H., Cheng, C., Chen, X., Shi, J., & Zhang, H. (2024). The impact of caregiver burden on quality of life in family caregivers of patients with advanced cancer: a moderated mediation analysis of the role of psychological distress and family resilience. *BMC Public Health*, 24(1), 817–827. <https://doi.org/10.1186/s12889-024-18321-3>
- Dewi, R., Budhiana, J., Fatmala, S. D., Yulianti, M., & Arsyi, D. N. (2023). Coaching and training on five finger relaxation techniques for breast cancer patients to reduce fatigue, pain and sleep disorders. *Abdimas Galuh*, 5(1), 971–978. <https://doi.org/10.25157/ag.v5i1.10140>
- Dewi, R., Panduragan, S. L., Umar, N. S., Melinda, F., & Budhiana, J. (2022). The effect of religion, self-care, and coping mechanisms on quality of life in diabetes mellitus patients. *Jurnal Keperawatan Padjadjaran*, 10(1), 58–65. <https://doi.org/10.24198/jkp.v10i1.1971>
- Dewi, S. A. T., Herawati, T., & Muflikhati, I. (2024). The influence of family function, social support, and burden of care on the resilience of families living with the elderly. *Jurnal Sosial Humaniora (JSH)*, 17(1), 30–44. <https://doi.org/10.12962%2Fj24433527.v17i1.19922>
- Ding, Z., Fan, Y., Li, E., Ai, F., & Cui, H. (2024). Latent profile analysis of family adaptation in breast cancer patients-cross-sectional study. *Scientific Reports*, 14(1), 1–13. <https://doi.org/10.1038/s41598-024-72410-2>
- Grigoraş, G., Ilie, A. C., Turcu, A.-M., Albişteanu, S.-M., Lungu, I.-D., Ştefăniu, R., Pîslaru, A. I., Gavrilovici, O., & Alexa, I. D. (2025). Resilience and intrinsic capacity in older adults: a review of recent literature. *Journal*

Dewi, R., et al. (2026)

- of *Clinical Medicine*, 14(21), 7729. <https://doi.org/10.3390/jcm14217729>
- Haris, H. H., Royani, I., Yuniati, L., Gani, A. B., & Indarwati, R. P. (2024). Factors influencing self-efficacy among breast cancer patients in the chemotherapy center at Ibnu Sina YW-umi hospital in Makassar during the year 2024. *PREPOTIF: Jurnal Kesehatan Masyarakat*, 8(3), 6395–6409. <https://doi.org/10.31004/prepotif.v8i3.36866>
- Iqmy, L. O., Setiawati, & Yanti, D. E. (2021). Risk factors associated with breast cancer. *Jurnal Kebidanan*, 7(1), 32–36. <https://doi.org/10.33024/jkm.v7i1.3581>
- Kemendikbud. (2017). Parent series book: strengthening family resilience. Indonesian Ministry of Education and Culture. <https://repositori.kemendikdasmen.go.id/18360/1/buku-seri-orang-tua-ketahanan-keluarga.pdf>
- Lubis, N. L., Hasnida, H., & Novitarum, L. (2020). A families functional support for breast cancer survivor at haji adam malik hospital, medan 2020. *Proceeding ISETH (International Summit on Science, Technology, and Humanity)*, 43–49. <https://doi.org/10.23917/iseth.1270>
- Mcdonnell, G. A., Pope, A. W., & Ford, J. S. (2021). Associations among perceived parent and peer support, self-esteem, and cancer-related worry in adolescent and young adult cancer survivors 1. *Journal of Adolescent and Young Adult Oncology*, 10(2), 209–216. <https://doi.org/10.1089/jayao.2020.0111>
- Melguizo-Garín, A., Benítez-Márquez, M. D., Hombrados-Mendieta, I., & Martos-Méndez, M. J. (2023). Importance of social support of parents of children with cancer: a multicomponent model using partial least squares-path modelling. *International Journal of Environmental Research and Public Health*, 20(3), 1757–1765. <https://doi.org/10.3390/ijerph20031757>
- Niveau, N., New, B., & Beaudoin, M. (2021). How should self-esteem be considered in cancer patients? *Perspective*, 12(2), 76–90. <https://doi.org/10.3389/fpsyg.2021.763900>
- Opsomer, S., Joossens, S., De Lepeleire, J., Pype, P., & Lauwerier, E. (2022). Trapped in a double cage: How patients' partners experience the diagnosis of advanced cancer in times of the COVID-19 pandemic: An interpretative phenomenological analysis. *Palliative Medicine*, 36(5), 810–820. <https://doi.org/10.1177/02692163221080660>
- Pardede, J. A., Simamora, M., & Simanjuntak, G. V. (2020). Family support and self-esteem of patient with breast cancer. *EAS Journal of Nursing and Midwifery*, 2(3), 173–177. <https://doi.org/10.36349/EASJNM.2020.v02i03.026>
- Riskika, S., Pertiwi, M. R., Primasari, N. A., & Salamung, N. (2020). The effectiveness of family communication strategies for family members with health problems: A systematic review. *D'Nursing and Health Journal (DNHJ)*, 1(2), 69–78. <https://doi.org/10.23917/iseth.1270>
- Rosenberg, M. (1979). *Conceiving the Self*. Basic Books.
- Sabah, A., Aljaberi, M. A., Martin, J., Lee, K.-H., & Lin, C.-Y. (2025). Family resilience as a mediator in the relationship between family functioning and well-being. *Applied Research in Quality of Life*, 20(5), 1859–1885. <https://doi.org/10.1007/s11482-025-10499-x>
- Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling: in handbook of market research. Springer International Publishing. https://link.springer.com/rwe/10.1007/978-3-319-57413-4_15
- Seifyfard, M., Shohani, M., & Bastami, M. (2025). The effect of training based on the family-centered empowerment model on the self-efficacy and self-esteem of patients undergoing chemotherapy: A quasi-experimental study. *Int J Community Based Nurs Midwifery*, 13(4), 286–294. <https://doi.org/10.30476/ijcb>
- Semiz, D., & Sağlam Aksüt, R. (2022). Validity and reliability of the symptom-management self-efficacy scale for breast cancer related to chemotherapy. *Bezmialem Science*, 10(6), 805–813. <https://doi.org/10.14235/bas.galenos.2022.74946>
- Shi, Y., & Wu, W. (2023). Multimodal non-invasive non-pharmacological therapies for chronic pain: mechanisms and progress. *BMC Medicine*, 21(1), 372. <https://doi.org/10.1186/s12916-023-03076-2>
- Shoghi, M., Shahbazi, B., & Seyedfatemi, N. (2019). The effect of the family-centered empowerment model (FECM) on the care burden of the parents of children diagnosed with cancer. *Asian Pacific Journal of Cancer Prevention*, 20(6), 1757–1764. <https://doi.org/10.31557/APJCP.2019.20.6.1757>
- Smolarz, B., Nowak, A. Z., & Romanowicz, H. (2022). Breast cancer—epidemiology, classification, pathogenesis and treatment (review of literature). *Cancers*, 14(1), 1–27. <https://doi.org/10.3390/cancers14102569>
- Sumarsih, G., Freska, W., & Claudia, L. (2024). The relationship between family support and resilience and dengue fever prevention behavior in the elderly. *Jurnal Berkala Epidemiologi*, 12(1), 71–78. <https://doi.org/10.20473/jbe.V12i12024.71-78>
- Tsai, P. L., Kuo, T. T., Ku, C. H., Liao, G. S., Lin, C. K., & Pan, H. H. (2021). Self-esteem as a predictor of mental adjustment in patients with breast cancer. *International Journal of Environmental Research and Public Health*, 18(23), 12–27. <https://doi.org/10.3390/ijerph182312588>
- Uchiara, U. (2018). Nursing model of family role in premarital sexual risk behavior in female adolescents based on family centered nursing

- and self-efficacy theory [Universitas Airlangga]. https://repository.unair.ac.id/77130/2/TKP33_18_Uch_m.pdf
- Udeze, C. N., Ude, E. N., & Nnadozie, A. O. (2025). Self-efficacy, family support and knowledge of illness as correlates of adaptive coping among breast cancer patients. *International Journal of Research and Scientific Innovation (IJRSI)*, 12(15), 717–734. <https://doi.org/10.51244/IJRSI>
- WCRF. (2022). Breast cancer statistics. World Cancer Research Fund. <https://www.wcrf.org/preventing-cancer/cancer-statistics/breast-cancer-statistics/>
- Wulandari, W. K., Astuti, T., & Udani, G. (2024). The relationship between family support and self-efficacy in preoperative breast cancer patients : implications for healthcare practices. *Majalah Kesehatan Indonesia*, 5(2), 55–62. <https://doi.org/10.47679/makein.2024175>
- Yan, Y., Duan, X., Tan, Y., Wu, T., Yang, B. X., Luo, D., & Liu, L. (2025). The relationship between family functioning and depressive symptoms: Mediating effects of psychological resilience and parent-child interactions. *Journal of Affective Disorders*, 385, 119383. <https://doi.org/10.1016/j.jad.2025.119383>
- Yaner, N. R., Sukartini, T., Kristiawati, K., & Maulana, M. R. (2020). Family support required to increase compliance of medical control of patients with cancers. *Jurnal Ners*, 14(3), 331–335. <https://doi.org/10.20473/jn.v14i3.17177>
- Yanni, D. A. P., & Wijayanti, E. (2024). Impact of family support on breast cancer patient's nutritional status in jakarta. *Journal of Community Health Provision*, 4(3), 165–176. <https://doi.org/10.55885/jchp.v4i3.395>
- Zamralita, Z., Wilis, A. P. L., & Angelina, S. (2024). The role of family resilience on family functioning with family communication as mediator in generation z. *Jurnal Komunikasi*, 16(2), 508–524. <https://doi.org/10.24912/jk.v16i2.30434>

Internet addiction and online impulsive buying among university students: A cross-sectional study with regression and bootstrapped mediation

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Abstract

Background: University students frequently experience psychological distress. With the internet embedded in daily life, online activities, including online shopping may be used as coping strategies, but excessive use can contribute to internet addiction. Mechanism-oriented research also suggests that general online exposure may influence online impulsive buying through proximal processes such as internet addiction.

Purpose: This study aimed to determine factors associated with internet addiction among university students and to test whether internet addiction mediates the association between general online exposure (hours/day) and online impulsive buying.

Methods: A quantitative cross-sectional design was used among 386 university students at a campus in Kasihan, Bantul, Yogyakarta, Indonesia (January-April 2024) using convenience sampling. Internet addiction was measured using the Indonesian Internet Addiction Test (IAT) validated by Siste et al. (2021) (18 items; three-factor structure; Cronbach's $\alpha=0.855$). Online impulsive buying was measured using the Impulse Buying Tendency Scale (IBTS) adapted to online context. Psychological distress was measured using the Depression Anxiety Stress Scale (DASS-42). Spearman correlations were used for bivariate analysis. Multiple linear regression identified predictors of internet addiction. A simple mediation model (PROCESS Model 4; 5,000 bootstrap samples) tested Duration $\rightarrow$ internet addiction $\rightarrow$ online impulsive buying, controlling for age, sex, DASS total, and online loan history.

Results: Mean internet addiction score was 40.57 (SD 13.86) and mean online impulsive buying score was 37.02 (SD 8.91). Internet addiction correlated significantly with online impulsive buying ($p=.369$, $p<.001$), depression ($p=.163$, $p=.001$), anxiety ($p=.131$, $p=.010$), stress ($p=.147$, $p=.004$), and Duration ($p=.131$, $p=.010$). In multivariable regression, online impulsive buying ($B=0.673$, $p<.001$) and stress ($B=0.210$, $p=.002$) were significant predictors of internet addiction ($R^2=.215$). In mediation analysis, the indirect effect of duration on online impulsive buying through internet addiction was significant ($ab=0.1006$, 95% bootstrap CI [0.0085, 0.2154]), consistent with an indirect-only mediation pattern.

Conclusion: Online impulsive buying and stress were significantly associated with internet addiction, with online impulsive buying as the strongest predictor. Internet addiction also mediated the association between general online exposure and online impulsive buying.

Keywords: internet addiction; mediation; online impulsive buying; stress; university students.

Introduction

Students who reported higher academic stress also reported a general decline in their mental well-being (Barbayannis et al., 2022). A significant number of university students experience moderate to severe stress and depression (Kabir et al., 2023). Individuals experiencing significant stress or an inability

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to handle stress may develop mental health issues, including depression and anxiety (NHS, 2023). The mental health of university students is significantly correlated with their level of stress management knowledge (Thaha et al., 2023). During the pandemic, the behavior of college students in terms of online purchasing was substantially influenced by their ability to manage stress. This research also demonstrates that female students are more likely to engage in online purchasing and use it as a stress-relieving activity than their male counterparts (Rahardjo et al., 2023).

The development of technology and the internet, along with the advent of online shopping, has significantly transformed shopping behavior. Buyers do not have to come to shopping places as usual (Abdul, 2022). Several shopping applications provide installment services so that many consumers shop online (Maesen & Ang, 2025). Bank Indonesia recorded that the value of e-commerce transactions reached IDR 44.4 trillion in July 2025, indicating growth of 2.32%. Public knowledge and marketplace promotional strategies drive this (Departemen Komunikasi Bank Indonesia, 2025).

When shopping, people usually do not have a strategy. This can lead to erratic purchasing behavior among consumers, so that impulsive purchases often occur (Setyawaati, 2022). People has made an unplanned purchase (Harahap et al., 2023). Islam prohibits this behavior. Surah al-Isra verse 27 explains that wasteful people are the brothers of Satan, who is deeply ungrateful to his Lord. The consequence of impulsive buying is regret over the purchase made. Some people even sacrifice their financial security to enjoy momentary pleasurable emotions (George & R, 2025). Online loans trap many unemployed students, encouraging them to adopt impulsive lifestyles and behaviors (Pangaribowo & Belarminus, 2023). Online promotions encourage them to make purchases (Hajati, 2023).

Reports indicate that 210 million people in Indonesia used the internet in 2022. This allows internet users to make more online transactions (Asosiasi Penyelenggara Jasa Internet Indonesia, 2022). In 2024, the percentage of internet users in the Special Region of Yogyakarta Province was 88,73%, and it is increasing every year (Sianturi, 2025).

Continuous use of the internet can cause addiction, which results in negative behavior (Brand, 2022). Technology, the internet, and digital impacts have a significant influence on students and college students in terms of their psychological development and health (Abueva et al., 2025). Internet addiction is a condition where someone uses the internet excessively and is unable to control it, resulting in negative tendencies (Gunawan et al., 2021). Internet addiction poses a significant risk to society today and in the future, particularly for the younger generation who heavily rely on technological devices in their daily lives (Mishra et al., 2024). Internet addiction is one

of the factors that causes impulsive behavior. A wide internet connection makes it easier for someone to learn about offers and products. People often make impulsive purchases of items they've viewed online, even without prior planning (Nyrhinen et al., 2024). People who are always online find it easier to obtain information without realizing it, which encourages them to engage in impulsive online buying (Nyrhinen et al., 2023). According to a preliminary study, students frequently make impulsive purchases through e-commerce, fall victim to online loans, borrow other people's accounts or personal data for these loans, and experience increased stress as a result. This study is crucial in understanding the mental health conditions of students affected by impulsive buying behavior and internet addiction, enabling the development of effective strategies to prevent internet addiction in university students.

Materials and Methods

Design

A quantitative cross-sectional design with an associative approach was used to examine the association between the independent variable (independent variable) and the dependent variable (Sugiyono, 2025).

Sample and Setting

Participants were 386 university students recruited using convenience sampling at a campus in Kasihan, Bantul, Yogyakarta, Indonesia, from January to April 2024.

Variables

Internet addiction (IAT total score) was the primary dependent variable for the main regression model. Independent variables included online impulsive buying, depression, anxiety, stress, and Duration (hours/day).

Instruments

Internet Addiction Test (IAT): The Indonesian IAT validated by Siste et al. (2021) was used. The validated version contains 18 items rated 0–5 (0=never to 5=always), total range 0–90. It has three domains (silence/salience, neglect of duty, and loss of control) and good reliability ($\alpha=0.855$) (Siste et al., 2021).

Impulse Buying Tendency Scale (IBTS), online context: The IBTS comprises 20 items across cognitive (10 items) and affective (10 items) dimensions, using a 4-point Likert response format with reverse scoring for unfavorable items. In a pilot validity test ($n=40$; $r\text{-table}=0.312$; $\alpha=0.05$), items 11, 17, and 20 were not valid and were removed for the main analysis. Pilot internal consistency was acceptable (Cronbach's $\alpha=0.720$; 20 items).

Depression Anxiety Stress Scale (DASS-42): DASS-42 includes 42 items across three 14-item subscales (depression, anxiety, and stress). For mediation models, DASS total (0–126) was used

as a covariate to reduce multicollinearity among subscales.

Ethics

Ethical approval was granted by the Health Research Ethics Committee, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta (Approval No. 303/EC-KEPK FKIK UMY/XII/2023; issued December 27, 2023). Written informed consent was obtained from all participants, and data were anonymized.

Data collection

Data was collected using validated questionnaires administered to the respondents. Written informed consent was obtained from all participants after they were informed about the study objectives, procedures, and data management practices, including confidentiality and anonymization. Participants' identities were anonymized in all study reports.

Data Analysis

Univariate statistics (mean, SD) were computed. Spearman correlation was used for bivariate analysis. Multiple linear regression identified predictors of internet addiction. All statistical analyses were deemed statistically significant if the probability of error was less than 5% ($p < 0.05$), and the confidence interval was established at 95% confidence. A simple mediation analysis (PROCESS Model 4; 5,000 bootstrap samples) tested whether internet addiction mediated the association between Duration and online impulsive buying, controlling for

age, sex, DASS total, and online loan history.

Results

Descriptive statistics and bivariate correlations are presented in [Tables 1–4](#). The multivariable regression model predicting internet addiction is presented in [Tables 5–6](#). The bootstrapped mediation model is summarized in [Table 7](#).

[Table 1](#) reveals an average internet addiction score of 40.57, accompanied by a standard deviation of 13.861. Based on gender, men have a higher average addiction score of 40.95, and for >6 hours the average addiction score is 41.05, and the age with the highest addiction score is 19 years with a mean of 44.27.

[Table 2](#) shows that students' average online impulsive buying score is 37.02, with a standard deviation of 8.912. Women are more impulsive than men. Duration >6 hours has a higher mean value than duration <6 hours, which means they are more impulsive.

According to [Table 3](#), the mean of depression, anxiety, and stress is higher in females than in males, and individuals who use the internet for more than six hours have a higher mean score of these conditions than those who use the internet for less than six hours.

Men use the internet more for online gaming activities, while women focus more on online shopping and interpersonal communication, and most associate internet abuse with game addiction ([Xie et al., 2023](#)). Males are more susceptible to experiencing a constant need to play online games,

Table 1. Description of internet addiction

Variable	Mean	Minimum	Maximum	Std.Dev	N
Internet Addiction	40.57	7	90	13.861	386
Sex					
Male	40.95	15	90	15.074	
Female	40.41	7	80	13.353	
Duration					
<6 hours	37.92	16	73	14.189	
>6 hours	41.05	7	90	13.769	

Table 2. Description of Impulsive Buying Online scores

Variable	Mean	Minimum	Maximum	Std.Dev	N
Impulsive buying online	37.02	17	68	8.912	386
Sex					
Male	35.54	17	68	9.613	113
Female	37.51	19	68	8.474	273
Duration					
<6 hours	36.78	19	68	9.651	59
>6 hours	36.96	17	68	8.719	327

Table 3. Description of Depression, Anxiety and stress scores

Variable	Mean	Minimum	Maximum	Std.Dev	N
Depression score	10.51	0	42	9.67	386
Sex					
Male	9.51	0	30	8.41	113
Female	10.93	0	42	10.93	273
Duration					
<6 hours	8.52	0	39	8.32	96
>6 hours	11.17	0	42	10.00	290
Anxiety	11.41	0	42	9.05	386
Sex					
Male	10.53	0	31	7.75	113
Female	11.77	0	42	9.50	273
Duration					
<6 hours	9.83	0	36	8.50	96
>6 hours	11.93	0	42	9.15	290
Stress	12.67	0	42	9.52	386
Sex					
Male	11.38	0	32	8.11	113
Female	13.20	0	42	10.13	273
Duration					
<6 hours	10.98	0	38	9.15	96
>6 hours	13.22	0	42	9.59	290

Table 4. Relationship between stress, anxiety, depression, internet addiction and impulsive online buying behavior in students

Variables	Internet Addiction	Impulsive Buying Online	Depression	Anxiety	Stress	Duration
1	1.000	.369**	.163**	.131**	.147**	.131*
	.	.000	.001	.010	.004	.010
	386	386	386	386	386	386
2		1.000	-.004	-.007	-.018	.072
		.	.934	.899	.730	.160
		386	386	386	386	386
3			1.000	.879**	.847**	.131*
			.	.000	.000	.010
			386	386	386	386
4				1.000	.909**	.114*
				.	.000	.025
				386	386	386
5					1.000	.140**
					.	.006
					386	386
6						1.000
						.
						386

Table 5. Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.464c	.215	.209	12.32814

Table 6. Final model of internet addiction associated factor

Variables	B	SE	Beta	t	p-value
Impulsive Buying Online	0.673	0.071	0.430	9.451	0.000*
Stress	0.210	0.067	0.144	3.150	0.002*
Duration	0.237	0.137	0.080	1.735	0.083

B: parameter estimates, SE: standard error, Beta: standardized estimates, significant at * $p < 0.05$.

Multiple linear regression indicated that online impulsive buying ($B=0.673$, $p<.001$) and stress ($B=0.210$, $p=.002$) were significant predictors of internet addiction ($R^2=.215$).

Table 7. Bootstrapped Mediation (PROCESS Model 4; 5,000 samples)

Effect	Estimate	Inference
a: Duration → Internet addiction	0.3602	$p=.0209$
b: Internet addiction → Online impulsive buying	0.2792	$p<.001$
c: Total effect Duration → Online impulsive buying	0.1357	$p=.1727$
c': Direct effect Duration → Online impulsive buying	0.0352	$p=.6966$
Indirect effect (ab)	0.1006	95% Boot CI [0.0085, 0.2154]

PROCESS mediation (Model 4) indicated a significant indirect effect of Duration on online impulsive buying through internet addiction ($ab=0.1006$, 95% bootstrap CI [0.0085, 0.2154]), while total and direct effects were not significant, consistent with an indirect-only mediation pattern.

spending more time playing than females (Mari et al., 2023). This occurs when exposed to game cues. Men with internet gaming disorder show lower brain activation areas (such as the posterior cingulate cortex (PCC) and higher anterior cingulate cortex/middle Para hippocampal gyrus) effective connectivity compared to women.

Frequent internet use contributes to the fear of missing out (FOMO), in various aspects of technology and cyberspace (Rautela & Sharma, 2022). Meanwhile, women tend to engage in impulsive behavior caused by high fear of missing out, followed by hedonistic and materialistic shopping motivations (Chetioui & El Bouzidi, 2023).

In addition, the lack of self-control in female students and marketing and promotional tactics can also influence online impulsive buying (Ekambareswarar et al., 2021). In the developmental stage, students enter the early adult development stage (19–35 years). Younger people tend to have higher levels of internet addiction compared to older people (Raymond & Kartasasmita, 2022). Internet addiction is thought to be more common in college students than in adults. Neurological and social vulnerabilities can trigger increased addiction.

The internet is widely available to students compared to the general public students can use the internet anywhere and at any time. me. The majority of students have personal gadgets with easy internet access; this risks causing internet addiction (Suhendra et al., 2023). Learning and assignments

on the internet make them connect online more often. Someone who is addicted to the internet has a higher number of hours of use where they spend more than 5 hours playing the internet (Acharya et al., 2023). It is possible that the electromagnetic fields generated by gadgets have an effect on the autonomic nervous system (ANS), which modulates the circulatory system (BijaraniyaKuldeep & Kumar, 2022). In addition, internet addiction rates and stress levels among college students increase with increasing duration of internet use (Nakshine et al., 2022).

Based on Table 4, the bivariate test results reveal a significant correlation between internet addiction and online impulsive buying behavior in students ($p = 0.000$, $r = 0.308$). Additionally, there is a significant correlation between internet addiction and depression scores ($p = 0.001$, $r = 0.163$), anxiety ($p = 0.010$, $r = 0.131$), stress ($p = 0.004$, $r = 0.147$), depression and anxiety ($p = 0.000$, $r = 0.879$), stress and depression ($p = 0.000$, $r = 0.847$), and anxiety and stress ($p = 0.000$, $r = 0.909$).

We can interpret the correlation between internet addiction and online impulsive buying behavior in students as a weak, positive correlation. indicating that higher internet addiction scores are associated with slightly higher levels of impulsive buying. However, the strength of this association is small and should be interpreted cautiously with limited practical significance. The exchange of information via the internet influences interpersonal decision-

making in certain activities, such as purchasing behavior (Ngo et al., 2024).

Online trading tools on shopping platforms and social networking sites allow consumers to communicate with each other, and recommendations from influencers can stimulate unexpected online purchases (Olsen et al., 2022). Previous study stated that the internet significantly influences consumers' impulsive buying behavior (Jie et al., 2022). Additionally, Al-Huda et al., (2022) found that consumers with higher internet usage intensity easily succumb to attractive promotions and find it easier to make purchase transactions. The presence of e-payment and PayPal makes online shopping more attractive (Frihatini et al., 2026). The pay later feature is an alternative payment that makes it easier for consumers to get credit, which can trigger impulsive buying behavior. Convenience, speed, and lower interest rates encourage consumers to make impulsive purchases (Dzul Hilmi & Pratika, 2021).

Table 5

The final model that identifies the factors associated with internet addiction in this study was identified by the results of the multiple linear regression analysis presented in Table 6. The equation for internet addiction is $10.855 + 0.673$ (impulsive buying online) $+ 0.210$ (stress). In the regression analysis, stress and online impulsive buying emerged as the strongest statistical predictors of internet addiction ($p < 0.05$). Backward multiple linear regression was conducted to identify predictors of addiction score ($N=386$). The final model including impulsive buying online score, stress score, and duration was significant, $F(3,382) = 34.897$, $p < .001$, explaining 21.5% of the variance ($R^2=.215$; $Adj.R^2=.209$). Impulsive buying online score ($B=0.673$, $\beta=0.430$, $p<.001$) and stress score ($B=0.210$, $\beta=0.144$, $p=.002$) were significant positive predictors, while duration showed a marginal effect ($B=0.237$, $p=.083$) but was retained under the backward removal criterion ($p \geq .10$). Multicollinearity was not a concern in the final model ($VIF=1.008-1.026$). Visual inspection of residual plots suggested approximately normal residuals and homoscedasticity

Discussion

Cravings are significantly associated with impulse buying online (Rodrigues et al., 2021). Cognitive processes are implicated in the craving response that manifests in impulsive buying online (Müller et al., 2022). Online compulsive consumers devote an extensive amount of time to e-commerce websites in order to decide whether or not to make a purchase (Jameel et al., 2024). Impulsivity is elevated by online purchasing (Xu et al., 2022). Self-control has a negative and significant effect on consumptive behavior (Akmalia & Darmawanti, 2023).

People who have a proclivity for obsessive

online purchasing behavior may have been encouraged to develop addiction (Ardyan et al., 2023). Online purchasing addiction is facilitated by low self-regulation in an online environment, which in turn leads to dissatisfaction with personal money management due to indebtedness (Nyrhinen et al., 2023). In the context of internet addiction and conflict processes, the craving process is associated with the anterior cingulate cortex (ACC), insula, putamen, and caudate (Sun et al., 2025). A group that was addicted to the internet exhibited increased activity in the bilateral dorsolateral prefrontal cortex. Stress influences internet addiction both directly and indirectly (M. Aziz et al., 2024). Mental health is associated with internet addiction (Jaafar et al., 2022). Anxiety partially mediated the impact of stress on Internet Addiction, and self-control moderated the relationship between stress and anxiety (Shen et al., 2023). Social class significantly moderates the association between stress and Internet addiction, as well as between stress and social anxiety. Social anxiety partly moderate the influence of social class on stress and Internet addiction, with the indirect moderating impact being 16.7% of the overall moderating effect (Kavici & Ayaz-Alkaya, 2024).

Despite its contributions, this study has several limitations. First, the use of self-reported questionnaires may have introduced response or social desirability bias. Second, the sample was not representative of the broader population, particularly individuals from diverse cultural backgrounds, which may limit the generalizability of the findings. Third, the cross-sectional design does not allow for the examination of causal relationships among the variables, as associations were assessed at a single point in time.

This study found that online impulsive buying and stress were significant predictors of internet addiction among university students. Bootstrapped mediation results suggest that general online exposure (hours/day) relates to impulsive online buying primarily through internet addiction, supporting a distal-to-proximal conceptualization (exposure $\rightarrow$ addiction $\rightarrow$ impulsive buying). Given the cross-sectional design, causal inference is limited, but the indirect effect provides evidence consistent with the hypothesized mechanism. Internet addiction positively impacts impulse buying (Fatmawati & Vernanda, 2024).

Community mental health nurses are ideally situated to implement these results via early identification, concise psychosocial treatments, and organized referrals and follow-up. Nurses frequently operate as the initial point of contact with student health services, and nurse-led initiatives in campus environments have demonstrated the capacity to enhance mental health outcomes via screening, education, and organized interventions (Russell et al., 2025). The importance of local wisdom in developing a sustainable and context-sensitive mental health framework for Muslim students (A. N. Aziz et al., 2026). Improving digital literacy can contribute to long-term improvements in mental

health (Setyaningrum & Suud, 2025).

Consequently, community mental health nurses can implement a stepped-care model on campus: (1) universal health promotion and “digital wellbeing” literacy, (2) targeted screening for students exhibiting high stress and/or impulsive purchasing behaviors, and (3) brief interventions aimed at enhancing adaptive coping and reinforcing self-regulation. Online and hybrid therapies are pertinent since systematic data indicates that online-based mindfulness effectively mitigates stress, anxiety, and depression among college students, hence correlating with your key predictor (stress) and the self-regulation mechanisms associated with addiction (Gong et al., 2023).

Limitations

Self-reported measures may introduce reporting bias. The cross-sectional design limits causal inference and temporal ordering. The sample was drawn from one campus setting, limiting generalizability.

Conclusion

Online impulsive buying and stress were significantly associated with internet addiction, with online impulsive buying emerging as the strongest predictor. Internet addiction also mediated the association between general online exposure and online impulsive buying.

It is recommended that community mental health nurses implement stepped care on campus: digital wellbeing education, targeted screening, followed by brief intervention and referral if necessary. Interventions should prioritize stress management and self-regulation, including online mindfulness options that have been proven to help reduce stress, anxiety, and depression among students. Nurses also need to coordinate digital mental health support with light monitoring, as well as collaborate with student affairs/finance units to educate students about debt risks and strengthen financial literacy in order to reduce triggers for impulsive purchases.

Declaration of Interest

All author declare no conflict of interest.

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References

Abdul, R. (2022). The moderating role of religiosity in the relationship between internet addiction and

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Abueva, N., Buzelo, A., Wu, Y., Turniyazova, Z., Karakushev, D., & Obrenovic, B. (2025). Digital technologies and student mental health: risks of social media and the promise of virtual reality and autonomous sensory meridian response interventions. *Psychology Research and Behavior Management*, 18, 2179. <https://doi.org/10.2147/PRBM.S540053>

Acharya, S., Adhikari, L., Khadka, S., Paudel, S., & Kaphle, M. (2023). Internet addiction and its associated factors among undergraduate students in Kathmandu, Nepal. *Journal of Addiction*, 2023, 8782527. <https://doi.org/10.1155/2023/8782527>

Akmalia, A., & Darmawanti, S. N. F. (2023). Effect of financial literacy, lifestyle and self-control on consumptive behavior considering students of University of Muhammadiyah Yogyakarta in Indonesia. *Lecture Notes on Data Engineering and Communications Technologies*, 182, 361–371. https://doi.org/10.1007/978-3-031-40971-4_34

Al-Huda, S., Kurnia, R., & Lia, F. (2022). Moderation of religiosity in the relation of internet addiction to impulse online buying (Study on State Islamic University of raden Intan Lampung Z Generation). *Revenue: Jurnal Manajemen Bisnis Islam*, 3(1), 137–156. <https://doi.org/10.24042/revenue.v3i1.11621>

Ardyan, E., Gracela, & Sanapang, M. (2023). Online compulsive buying and brand addiction in Indonesia: The importance of using fear of missing out and social commerce interactivity. *Journal The Winners*, 24(2), 117–126. <https://doi.org/10.21512/TW.V24I2.10817>

Asosiasi Penyelenggara Jasa Internet Indonesia. (2022). APJII di Indonesia Digital Outlook 2022. https://apjii.or.id/berita/d/apjii-di-indonesia-digital-outlook-2022_857

Aziz, A. N., Madjid, A., Khilmiyah, A., Partino, R., & Azhar, M. (2026). Managing academic stress in Islamic boarding schools: Toward a value-based framework rooted in Panca Jiwa Pondok. *Multidisciplinary Reviews*, 9(7), 2026360–2026360. <https://doi.org/10.31893/multirev.2026360>

Aziz, M., Chemnad, K., Al-Harashsheh, S., Abdelmoneium, A. O., Baghdady, A., & Ali, R. (2024). Depression, stress, and anxiety versus internet addiction in early and middle adolescent groups: The mediating roles of family and school environments. *BMC Psychology*, 12(1), 1–16. <https://doi.org/10.1186/S40359-024-01659-Z/FIGURES/6>

Barbayannis, G., Bandari, M., Zheng, X., Baquerizo, H., Pecor, K. W., & Ming, X. (2022). Academic stress and mental well-being in college students: correlations, affected groups, and COVID-19. *Frontiers in Psychology*, 13, 886344. <https://doi.org/10.3389/FPSYG.2022.886344>

- BijaraniyaKuldeep, & Kumar, B. (2022). Effect of electromagnetic fields emitted by mobile phone on cardiovascular autonomic function tests. *International Journal Dental and Medical Sciences Research*, 4(2), 348. <https://doi.org/10.35629/5252-0402348353>
- Brand, M. (2022). Can internet use become addictive? *Science*, 376(6595), 798–799. <https://doi.org/10.1126/SCIENCE.ABN4189>
- Chetioui, Y., & El Bouzidi, L. (2023). An investigation of the nexus between online impulsive buying and cognitive dissonance among Gen Z shoppers: Are female shoppers different? *Young Consumers*, 24(4), 406–426. <https://doi.org/10.1108/YC-06-2022-1548>
- Departemen Komunikasi Bank Indonesia. (2025). Maintaining security amidst the convenience of digital transactions. <https://www.bi.go.id/id/publikasi/ruang-media/cerita-bi/Pages/Menjaga-Keamanan-di-Tengah-Kenyamanan-Transaksi-Digital.aspx>
- Dzul Hilmi, L., & Pratika, Y. (2021). Paylater future: Impulsive buying driver for e-commerce In Indonesia. *Business and Accounting Research (IJEBA)* Peer Reviewed-International Journal, 5.
- Ekambareswarar, N. K., Boomika, D., & Kumar, R. D. (2021). A study about gender differences in impulsive buying decisions among university postgraduate students in Bengaluru, India. *International Journal of Business Forecasting and Marketing Intelligence*, 7(2), 113. <https://doi.org/10.1504/IJBFMI.2021.120129>
- Fatmawati, I., & Vernanda, F. A. (2024). Understanding the impact of internet addiction on impulse buying: Exploring task orientation and self-efficacy. *Lecture Notes in Networks and Systems*, 1012 LNNS, 599–609. https://doi.org/10.1007/978-981-97-3556-3_48
- Frihatini, F., Mila Vernia, D., Haryadi, R. T., Febryana Hutasuhut, A., & Maharani, I. (2026). Digital payment and online promotion effects on buying decisions in digital retail. *Airlangga Journal of Innovation Management*, 7(1), 67–85. <https://doi.org/10.20473/AJIM.V7I1.86488>
- George, A. M., & R, R. (2025). Swipe, click, regret: An opinion on persuasive e-commerce and consumer autonomy. *Frontiers in Artificial Intelligence*, 8. <https://doi.org/https://doi.org/10.3389/frai.2025.1684841>
- Gong, X. G., Wang, L. P., Rong, G., Zhang, D. N., Zhang, A. Y., & Liu, C. (2023). Effects of online mindfulness-based interventions on the mental health of university students: A systematic review and meta-analysis. *Frontiers in Psychology*, 14, 1073647. <https://doi.org/10.3389/fpsyg.2023.1073647>
- Gunawan, R., Aulia, S., Supeno, H., Wijanarko, A., Uwiringiyimana, J. P., & Mahayana, D. (2021). Social media and gadget addiction among internet users in Indonesia. *Techno-Socio Ekonomika*, 14(1), 1. <https://doi.org/10.32897/techno.2021.14.1.544>
- Hajati, D. I. (2023). The influence of internet addiction, materialism, hedonic shopping motivation and promotion on online impulse buying. *ATRABIS: Jurnal Administrasi Bisnis (e-Journal)*, 9(1), 32–43. <https://doi.org/10.38204/atrabis.v9i1.1424>
- Harahap, D. A., Irfani, A., Rachman, H., Harahap, E., & Amanah, D. (2023). Impact of panic purchases on unplanning purchases in retail store. *KnE Social Sciences*, 1055–1065–1055–1065. <https://doi.org/10.18502/KSS.V8I18.14312>
- Jaafar, N. S., Idris, I. B., Ahmad, N., Hod, R., Baddiri, B., & Hod, R. (2022). Internet addiction and its association with depression, anxiety, and stress symptoms among allied health students in Malaysia. *Medical Journal of Indonesia*, 31(1), 56–61. <https://doi.org/10.13181/MJI.OA.225820>
- Jameel, A., Khan, S., Alonazi, W. B., & Khan, A. A. (2024). Exploring the impact of social media sites on compulsive shopping behavior: The mediating role of materialism. *Psychology Research and Behavior Management*, 17, 171–185. <https://doi.org/10.2147/PRBM.S442193>
- Jie, W., Poulouva, P., Haider, S. A., & Sham, R. B. (2022). Impact of internet usage on consumer impulsive buying behavior of agriculture products: Moderating role of personality traits and emotional intelligence. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.951103>
- Kabir, R., Sultana, M. Z., Haque Mondal, M. S., & Kabir, I. (2023). Undergraduate student's stress, anxiety, depression, and their coping styles during COVID-19. *Mental Health: Global Challenges*, 6(1), 67–76. <https://doi.org/10.56508/mhgcj.v6i1.156>
- Kavici, S., & Ayaz-Alkaya, S. (2024). Internet addiction, social anxiety and body mass index in adolescents: A predictive correlational design. *Children and Youth Services Review*, 160, 107590. <https://doi.org/10.1016/J.CHILDYOUTH.2024.107590>
- Maesen, S., & Ang, D. (2025). Buy now, pay later: Impact of installment payments on customer purchases. *Journal of Marketing*, 89(3), 13–35. <https://doi.org/10.1177/00222429241282414>
- Mari, E., Biondi, S., Varchetta, M., Cricenti, C., Frascchetti, A., Pizzo, A., Barchielli, B., Roma, P., Vilar, M. M., Sala, F. G., Giannini, A. M., & Quaglieri, A. (2023). Gender differences in internet addiction: A study on variables related to its possible development. *Computers in Human Behavior Reports*, 9, 100247. <https://doi.org/10.1016/J.CHBR.2022.100247>
- Mishra, J., Behera, M. R., Mitra, R., Samanta, P., Mahapatra, P. K., & Kar, S. (2024). Prevalence and impact of internet addiction disorder among adolescents and young adults. *The*

- Open Public Health Journal*, 17. <https://doi.org/10.2174/0118749445345806241010081642>
- Müller, A., Joshi, M., & Thomas, T. A. (2022). Excessive shopping on the internet: Recent trends in compulsive buying-shopping disorder. *Current Opinion in Behavioral Sciences*, 44, 101116. <https://doi.org/10.1016/J.COBEHA.2022.101116>
- Nakshine, V. S., Thute, P., Khatib, M. N., & Sarkar, B. (2022). Increased screen time as a cause of declining physical, psychological health, and sleep patterns: A literary review. *Cureus*, 14(10), e30051. <https://doi.org/10.7759/CUREUS.30051>
- Ngo, T. T. A., Bui, C. T., Chau, H. K. L., & Tran, N. P. N. (2024). Electronic word-of-mouth (eWOM) on social networking sites (SNS): Roles of information credibility in shaping online purchase intention. *Heliyon*, 10(11), e32168. <https://doi.org/10.1016/J.HELİYON.2024.E32168>
- NHS. (2023). Student stress. <https://www.nhs.uk/mental-health/children-and-young-adults/help-for-teenagers-young-adults-and-students/student-stress-self-help-tips/>
- Nyrhinen, J., Lonka, K., Sirola, A., Ranta, M., & Wilska, T. A. (2023). Young adults' online shopping addiction: The role of self-regulation and smartphone use. *International Journal of Consumer Studies*, 47(5), 1871–1884. <https://doi.org/10.1111/IJCS.12961>
- Nyrhinen, J., Sirola, A., Koskelainen, T., Munnukka, J., & Wilska, T. A. (2024). Online antecedents for young consumers' impulse buying behavior. *Computers in Human Behavior*, 153, 108129. <https://doi.org/10.1016/J.CHB.2023.108129>
- Olsen, S. O., Khoi, N. H., & Tuu, H. H. (2022). The "Well-Being" and "Ill-Being" of online impulsive and compulsive buying on life satisfaction: The role of self-esteem and harmony in life. *Journal of Macromarketing*, 42(1), 128–145. <https://doi.org/10.1177/02761467211048751/FORMAT/EPUB>
- Pangaribowo, W. S., & Belarminus, R. (2023). Dozens of UMY students caught in loan schemes, using the money to replace cell phones and motorcycles. <https://yogyakarta.kompas.com/read/2023/09/12/163221878/puluhan-mahasiswa-umy-terjerat-pinjol-uangnya-buat-ganti-hp-hingga-motor?page=all>
- Rahardjo, W., Pranandari, K., Putri, D. E., Qomariyah, N., Rini, Q. K., & Andriani, I. (2023). Shopping to release stress? Understanding the role of coping stress and gender on online shopping behavior in college students during the COVID-19 pandemic. *Jurnal Psikologi Teori Dan Terapan*, 14(1), 114–123. <https://doi.org/10.26740/JPTT.V14N1.P114-123>
- Rautela, S., & Sharma, S. (2022). Fear of missing out (FOMO) to the joy of missing out (JOMO): shifting dunes of problematic usage of the internet among social media users. *Journal of Information, Communication and Ethics in Society*, 20(4), 461–479. <https://doi.org/10.1108/JICES-06-2021-0057>
- Raymond, A., & Kartasasmita, S. (2022). The relationship between smartphone addiction and psychological well-being in early adulthood.
- Rodrigues, R. I., Lopes, P., & Varela, M. (2021). Factors affecting impulse buying behavior of consumers. *Frontiers in Psychology*, 12, 697080. <https://doi.org/10.3389/FPSYG.2021.697080/TEXT>
- Russell, N. G., Rodney, T., Peterson, J. K., Baker, A., & Francis, L. (2025). Nurse-led mental health interventions for college students: A systematic review. *Preventing Chronic Disease*, 22, 1–20. <https://doi.org/10.5888/pcd22.240200>
- Setyaningrum, N., & Suud, F. M. (2025). Digital literacy as a predictor of mental health understanding among adolescent: Evidence from Yogyakarta, Indonesia. *BIO Web of Conferences*. <https://doi.org/10.1051/bioconf/202520303026>
- Setyawaati, Y. (2022). The influence of internet addiction, materialism, and e-payment on online impulse buying from a sharia business perspective.
- Shen, X., Wang, C., Liu, H., Chen, C., Wang, Y., Wang, Z., & Zheng, Y. (2023). Stress and internet addiction: Mediated by anxiety and moderated by self-control. *Psychology Research and Behavior Management*, 16, 1975. <https://doi.org/10.2147/PRBM.S411412>
- Sianturi, Y. M. (2025). DIY achieves the highest internet penetration in Indonesia. <https://datasatu.com/teknologi-dan-informasi/2819492/10-provinsi-dengan-penetrasi-internet-tertinggi>
- Siste, K., Suwartono, C., Nasrun, M. W., Bardosono, S., Sekartini, R., Pandelaki, J., Sarasvita, R., Murtani, B. J., Damayanti, R., & Wiguna, T. (2021). Validation study of the Indonesian internet addiction test among adolescents. *PLOS ONE*, 16(2), e0245833. <https://doi.org/10.1371/JOURNAL.PONE.0245833>
- Sugiyono. (2025). Quantitative, Qualitative and R&D Research Methodology (7th ed.). Alfabeta.
- Suhendra, I., Hartati, T., Rahman, & Rizkiya, L. M. N. (2023). Trends of smartphone ownership in elementary schools in Java Island: A review of survey results. *Jurnal Teknologi Pendidikan*, 10. <https://doi.org/10.31800/jtp.kw.v11n1.p115--126>
- Sun, Y., Wu, Q., Tang, J., & Liao, Y. (2025). Predicting drug craving among ketamine-dependent users through machine learning based on brain structural measures. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 136, 111216. <https://doi.org/10.1016/J.PNPBP.2024.111216>
- Thaha, R. M., Asram, A., Rahman, M. A., & Lifoia, C. (2023). The correlation of knowledge level on stress management with mental health of Hasanuddin University Students

Fahrizal, Y., et al. (2026)

- | Media Kesehatan Masyarakat Indonesia. *Media Kesehatan Masyarakat Indonesia Universitas Hasanuddin*, 19(1), 39–49. <https://journal.unhas.ac.id/index.php/mkmi/article/view/25435>
- Xie, X., Cheng, H., & Chen, Z. (2023). Anxiety predicts internet addiction, which predicts depression among male college students: A cross-lagged comparison by sex. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.1102066>
- Xu, C., Unger, A., Bi, C., Papastamatelou, J., & Raab, G. (2022). The influence of Internet shopping and use of credit cards on gender differences in compulsive buying. *Journal of Internet and Digital Economics*, 2(1), 27–45. <https://doi.org/10.1108/JIDE-11-2021-0017>

Improving patient safety awareness in nursing students through low-fidelity simulation and clinical practice: Pre-experimental study

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Abstract

Background: The incidence of patient harm is increasing globally, with nursing students contributing to errors during training and clinical practice. However, research on nursing students' awareness of patient safety following simulation-based training and clinical practice remains limited.

Purpose: This study analysed nursing students' awareness of patient safety before and after low-fidelity simulations and clinical practice.

Methods: A one-group pretest–post-test interventional design was used. The study involved 446 first-year nursing students at Universitas Pelita Harapan, Tangerang, Indonesia. The independent variable was participation in structured low-fidelity simulation sessions followed by clinical practice, while the dependent variable was patient safety awareness. Awareness was measured before and after the intervention using the World Health Organization Patient Safety Questionnaire, consisting of 33 items rated on a five-point Likert scale. It contains five domains: knowledge of patient safety, safety of the healthcare system, ability to influence patient safety, personal attitudes toward patient safety, and workplace safety. Data were analysed using descriptive statistics and paired-samples t-tests with a significance level of 0.05.

Results: Total patient safety awareness scores increased significantly after the intervention (118.25 ± 9.90 vs. 120.78 ± 10.76 , $t = -4.90$, $p < 0.001$). Significant improvements were observed in knowledge of patient safety, perception of healthcare system safety, and perceived ability to influence safety. Students with a science background in senior high school demonstrated higher awareness.

Conclusion: Low-fidelity simulation and clinical practice significantly improved nursing students' patient safety awareness, supporting early integration of structured patient safety education in nursing curricula.

Keywords: awareness; clinical practice; nursing students; patient safety; simulation-based training

Introduction

Patient safety is paramount in healthcare and has become a primary objective for hospitals worldwide (World Health Organization, 2023). It is fundamental in providing superior-quality patient care, particularly within the nursing domain (Agency for Healthcare Research and Quality, 2019; World Health Organization, 2023). The attainment of patient safety objectives of healthcare providers will ensure that patients receive safe, and high-quality care (World Health Organization, 2023). Since its introduction in the 1990s, patient safety has evolved and continues to be utilized today (Donaldson, 2020). The World Health Organization (WHO) urged all hospitals to guarantee patient safety throughout service delivery (World Health Organization, 2023). In addition to the WHO, numerous groups advocate for patient safety, including

Joint Commission International, whose standards are extensively implemented in hospitals across Indonesia (Afriani et al., 2022). Failure to adhere to patient safety standards can result in significant harm to patients (Higham & Vincent, 2020).

Globally, approximately 1 in 10 patients experience harm during healthcare delivery (World Health Organization, 2023). This harm may result from various preventable causes, including adverse drug reactions, urinary tract infections, infections associated with intravenous catheters, hospital-acquired pneumonia, venous thromboembolism, patient falls, and pressure ulcers. Additionally, 1 in 20 patients (5%) suffer preventable patient safety incidents, with Southeast Asia and Africa showing some of the highest rates of preventable medication-related harm at 9% (World Health Organization, 2024). Of 108 countries responding to a global patient safety survey, 55% reported that patient safety is a national policy priority, including Sri Lanka, Brunei Darussalam, Ireland, and Myanmar. These findings highlight the need to further strengthen patient safety efforts at the national level in Indonesia (World Health Organization, 2024).

Patients are harmed not only by professional healthcare providers, including nurses, but also by nursing students. A systematic review revealed that nursing students contribute to adverse patient occurrences, particularly medication errors (Triantafyllou et al., 2023). In that review, among 1,904 nursing students, the most commonly reported medication errors were wrong dose (17%), wrong time (13.6%), and omission errors (16.4%) (Triantafyllou et al., 2023). That study concluded that numerous errors may occur among nursing students due to insufficient competencies, inadequate supervision, and deficient critical judgment (Triantafyllou et al., 2023). This study highlights the importance of implementing a program to improve students' competence in medication safety (Park & Yeom, 2025), which may be incorporated into the present study.

Recent studies indicate that nursing students possess enough knowledge and attitudes about patient safety (Bressan et al., 2021; Dimitriadou et al., 2021). However, there is still a report that many nursing students reported lower knowledge of patient safety (Levet-Jones et al., 2020). These studies, however, were conducted in the third year and final year. A study about the awareness of patient safety is required in the first year. Additionally, understanding patient safety among students in Indonesia remains moderate and requires further practice for enhancement (Suryani et al., 2022).

Simulation-based learning is widely recognized for improving patient safety in medical education, including nursing education, as it allows students to encounter and learn from errors in a safe learning environment, thereby reducing the likelihood of such errors occurring in real clinical practice (Elendu et al., 2024; Shahzeydi et al., 2024). As a part of simulation learning, a low-fidelity simulation also

has been widely utilized to enhance patient safety (Graf et al., 2024). Low-fidelity simulation has been shown to be effective in improving students' confidence, knowledge, and skills in performing clinical procedures (Massoth et al., 2019). However, limited research examines the efficacy of low-fidelity simulation in preparing novice nursing students to practice their skills in a hospital setting.

Clinical practice is also one of the methods to increase patient safety in nursing students. A study in Thailand found improved patient safety after clinical practice in second-year nursing students (Bandansin et al., 2022). Limited studies combine low fidelity and clinical service to examine students' patient safety awareness. Moreover, first-year nursing students are less researched, even though they are expected to understand and practice patient safety from the start of their education. Therefore, this study analysed patient safety awareness before and after low-fidelity simulation about patient safety following by clinical practice in first-year nursing students.

Materials and Methods

Design

This study utilized a pre-experimental study with a one-group pre- and post-design. The respondents were assessed before and after intervention to observe any changes over time within the same subjects.

Sample and setting

The population in this study was first-year nursing students at Universitas Pelita Harapan, Tangerang. A total sampling technique was used, in which all students who met the inclusion criteria were invited to participate. The inclusion criteria were being enrolled as a first-year nursing student during the study period and enrolled in the Principle Basic Nursing course. All eligible students were invited to participate in this study; however, those who did not complete the questionnaires, who dropped out, and duplicate response in both pretest and post-test were excluded from the final analysis. Of the 543 eligible students, complete data was obtained from 446 respondents, resulting in a response rate of 82.13 %. The study was conducted from September to December 2024.

Variables

The independent variable in this study was low-fidelity simulation training following clinical practice. The dependent variable was awareness of patient safety, which consists of five sections including error and patient safety, safety of healthcare system, personal influence over safety, personal attitudes to patient safety, and safety at the workplace.

Instruments

Patient safety awareness was assessed using the World Health Organization Medical School

Curricular Guide for Patient Safety questionnaire (World Health Organization, 2011). There are five sections in this questionnaire, including 1) Knowledge of patient safety (7 questions), 2) Safety of the healthcare system (6 questions), 3) Ability to influence patient safety (7 questions), 4) Personal attitudes to patient safety (4 questions), and 5) Safety at the workplace (9 questions). The questionnaire consists of 33 items, with 5 Likert scales with "1" indicating "*strongly disagree/very poor*" and "5" indicating "*strongly agree/very good*". The minimum score was 33, and the maximum score was 165. The higher score indicated a higher awareness of patient safety. This questionnaire was broadly used in measuring the awareness of patient safety in medical students (Al-Nawafleh et al., 2024; Walton et al., 2010). The questionnaire has good validity (Farley et al., 2015) and reliability (Cronbach alpha 0.70) based on previous study (Ghosh et al., 2024).

As the questionnaire was adapted from WHO Medical School Curricular Guide for patient safety, the Indonesian version was not available. The translation process was conducted using a premium language tool, followed by iterative review and discussion within the research team to ensure the conceptual and contextual. This pragmatic approach to translation has been reported in the previous study (Danielsen et al., 2015). This present study was focus on linguistic adaptation of established WHO-based instrument rather than full cross-cultural adaptation.

Intervention Procedure and Data Collection

The study began with a baseline assessment of participants' patient safety awareness. Participants then underwent a low-fidelity simulation focused on patient safety, followed by a one-time clinical practice session. After completing the intervention, patient safety awareness was reassessed using the same questionnaire administered at baseline. Students' baseline awareness of patient safety was measured for the initial assessment. This assessment was carried out after students had learned the concept of patient safety through lecture materials available on learning management systems. Students independently completed the questionnaires via an online form.

The low-fidelity simulation was held two days after the baseline assessment and implemented over one week for all students. They were divided into groups of five people, with each group member assigned a role: nurse, doctor, patient, children, and spouse. Every student was required to take on the nursing role at least once before rotating through the other roles. Every student had similar experience of simulation, with minor variations due to role rotation.

A low-fidelity simulation training consisted of four stages: pre-learning, pre-briefing, simulation activity, and debriefing. During the pre-learning stage, learning material were uploaded to the learning management system one week prior to the

simulation day, and students were expected to do self-study. In pre-briefing stage, facilitator explained about the simulation objectives, scenario context, and expected learning outcomes. Simulation activity lasted approximately 10 minutes and involved in scenario on oral feeding, focusing on patient safety issues like identification, correct treatment, and infection control. The simulation activity focused on situations that students were likely to encounter during clinical practice. A 10-minute of structured debriefing was conducted after the simulation activity to facilitate reflection and reinforce the learning outcomes. Following the simulation, students participated in a one-time, 5-hour clinical practice, assisted by lecturers and nurses in the hospital. The clinical practice was placed in an inpatient ward at a private hospital in Indonesia. In clinical practice setting, the students were expected to perform basic nursing skills, including bed bathing, oral feeding, vital sign measurement, positioning, and perineal hygiene. Through these skills, nursing students were exposed to patient safety issues. After finishing simulation training and clinical practice, the students were given one week to reassess their awareness of patient safety.

Data analysis

The data were analysed using a licensed version of Statistical Package for Social Science (SPSS) version 29. All variables were evaluated using descriptive analysis; categorical data were studied using percentages, and numerical data were analysed using mean and standard deviation. The normal distribution is verified for bivariate analysis to ensure that it meets the assumptions of bivariate analysis parametric. The normality test utilizes the Kolmogorov-Smirnov test, with the p-value total pretest being 0.04 and the post-test being 0.20, indicating the patient' safety awareness data were normally distributed. Based on this result, a paired sample t-test was employed in this study to differentiate the significance of the difference before and after the intervention. The alpha value for the bivariate tests was 0.05.

Ethical consideration

Ethical approval for this study was granted by the Institutional Review Board of Universitas Pelita Harapan (IRB UPH) under approval number 094/IRB-UPH/X/2024 on October 29, 2024. This approval is valid for one year from the date of issuance. Participation in this study was voluntary, and an online consent form was obtained from each participant prior to data collection. Students were informed prior to data collection that their decision to participate or not would not influence their academic grade or evaluation. Respondents were orally explained the study's purpose and the research process during the pre-class period. Participants were also assured they could withdraw from the study without any negative consequences. The questionnaires administered were anonymous.

Table 1. Demographics and nursing interest of respondents (N = 446)

Characteristics	n	%
Gender		
Male	53	11.9
Female	393	88.1
Reason to enter nursing school		
Own choices	373	83.6
Family choices	52	11.7
Other	21	4.7
Interest in study nursing		
Interest	407	91.3
Not interest	4	0.9
Confuse	35	7.8

Table 2. Mean score pre and post every section of WHO Patient Safety Questionnaire

Item	Pre-test		Post-test		[95% CI]	t	p
	Mean	SD	Mean	SD			
Knowledge of Patient Safety	25.09	3.89	26.53	3.91	-1.43 [-1.85, -1.01]	-6.72	<0.001***
Safety of the Health-care System	21.10	2.52	21.42	2.73	-0.32 [-0.05, -2.34]	-2.34	0.02*
Ability to influence patient safety	23.84	2.97	24.55	3.19	-0.70 [-1.00, -0.41]	-4.71	<0.001***
Personal Attitudes to Patient Safety	17.66	1.97	17.48	2.04	0.18 [-0.04, 0.40]	1.61	0.10
Safety at the Workplace	30.55	3.17	30.80	3.33	-0.24 [-0.59, 0.10]	0.08	0.16
Total score	118.25	9.90	120.78	10.76	-2.53 [-3.54, -1.51]	-4.90	<0.001***

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Results

A total of 543 students were invited to complete the pre-test questionnaire. Of these, 521 students responded, and 6 duplicate responses were identified. All 543 students then participated in a low-fidelity simulation, followed by clinical practice. After completing the learning activities, 543 students were invited to fill in the post-test questionnaire. During data cleaning, 101 students were excluded because they completed only the pre-test or only the post-test, meaning their data could not be paired for comparison. Participation was voluntary; therefore, no information was gathered regarding the reasons for incomplete responses. As a result, 446 students with complete pre- and post-test data were included in the final analysis. The study process flow chart is shown in Figure 1.

Table 1 presents the data on student characteristics. Most of the respondents were female (88.1%). They entered nursing school based on their choices (83.6%), and almost all respondents were interested in studying nursing (91.3%).

Table 2 presents the total patient safety scores

and the scores for each questionnaire section. There was a significant difference in the total scores before and after the intervention (118.25 [9.90] vs. 120.78 [10.76], $t = -4.90$, $p < 0.001$). Among the five questionnaire sections, Section 4 (personal attitudes to patient safety) and Section 5 (safety in the workplace) showed no significant differences between pre- and post-intervention scores (17.66 [1.97] vs. 17.48 [2.04], $t = 1.61$, $p = 0.10$; and 30.55 [3.17] vs. 30.80 [3.33], $t = 0.08$, $p = 0.16$, respectively). In contrast, three sections demonstrated significant increases following the intervention: Section 1 (knowledge of patient safety) (25.09 [3.89] vs. 26.53 [3.91], $t = -6.72$, $p < 0.001$), Section 2 (safety of the healthcare system) (21.10 [2.52] vs. 21.42, $t = -2.34$, $p < 0.05$), and Section 3 (ability to influence patient safety) (23.84 [2.97] vs. 24.55 [3.19], $t = -4.71$, $p < 0.001$).

The mean differences for each item are presented in Table 3. All items in Section 1 (knowledge of patient safety) showed significant differences between pre- and post-intervention scores. In Section 2 (safety of the healthcare system), significant differences were found in items related to healthcare workers

Table 3. Mean difference item of WHO Patient Safety Questionnaire (N = 446)

Item	Pretest		Post-test		t	p
	Mean	SD	Mean	SD		
Knowledge of Patient Safety						
Types of human error	3.55	0.73	3.72	0.73	-3.94	<0.001**
Factors contributing to human error	3.44	0.77	3.66	0.74	-4.71	<0.001**
Factors influencing patient safety	3.90	0.76	4.11	0.74	-4.60	<0.001**
Speaking up about error	3.36	0.79	3.57	0.83	-4.41	<0.001**
Things to do if an error happened	3.53	0.77	3.75	0.76	-4.70	<0.001**
Report an error	3.53	0.77	3.81	0.82	-5.76	<0.001**
The role of healthcare organizations	3.78	0.86	3.92	0.79	-2.79	<0.001**
Safety of the Healthcare System						
Healthcare workers make errors.	3.01	0.83	3.28	0.93	-5.63	<0.001**
Availability of safe system in the country	3.76	0.73	3.76	0.75	-0.06	0.95
The commonality of medical error	3.30	0.88	3.48	0.89	-3.92	<0.001**
Unusual given wrong drug	3.21	0.94	3.09	0.90	2.25	0.02*
Training of patient safety	4.38	0.72	4.35	0.72	0.69	0.48
Experience of adverse event	3.43	0.95	3.46	0.96	-0.52	0.59
Ability to influence patient safety						
Telling other about error	2.94	0.96	3.21	0.97	-5.43	<0.001**
Find someone to blame	2.12	1.04	2.21	1.03	-1.75	0.08
Confidence to speak	3.38	0.91	3.55	0.89	-3.28	0.001**
Talk to people about error	3.49	0.68	3.57	0.71	-1.84	0.06
Able to ensure patient safety	3.74	0.93	3.84	0.89	-2.02	0.04*
Filling reporting forms	4.30	0.68	4.28	0.70	0.35	0.72
Filling reporting forms improve patient safety	3.88	0.74	3.90	0.76	-0.32	0.74
Personal Attitudes to Patient Safety						
Contribution to patient safety	4.11	0.63	4.07	0.64	0.93	0.35
Learning from mistake	4.54	0.63	4.46	0.64	2.16	0.03*
Acknowledge and dealing with errors	4.47	0.62	4.45	0.59	0.50	0.61
Learn to acknowledge and dealing with errors	4.55	0.59	4.50	0.61	1.40	0.16
Safety at the Workplace						
Nurses identify and address patient safety	4.52	0.58	4.46	0.60	1.99	0.04*
Nurses will not criticize	2.08	0.94	2.06	0.91	0.38	0.70
Doctors identify and address patient safety	4.28	0.71	4.22	0.69	1.36	0.17
Doctors will not criticize	1.94	0.86	2.01	0.89	-1.57	0.11
Support from healthcare managers	3.52	0.80	3.71	0.81	-3.92	<0.001**
Managerial prioritization of performance targets	2.33	1.02	2.41	1.02	-1.55	0.12
Managerial expectation	4.20	0.69	4.23	0.71	-0.72	0.46
Acceptability of openness and honesty	3.91	0.86	3.92	0.83	-.24	0.80
Just and fair treatment by management	3.78	0.83	3.79	0.82	-0.37	0.71

Note. * p < 0.05, ** p < 0.01, *** p < 0.001

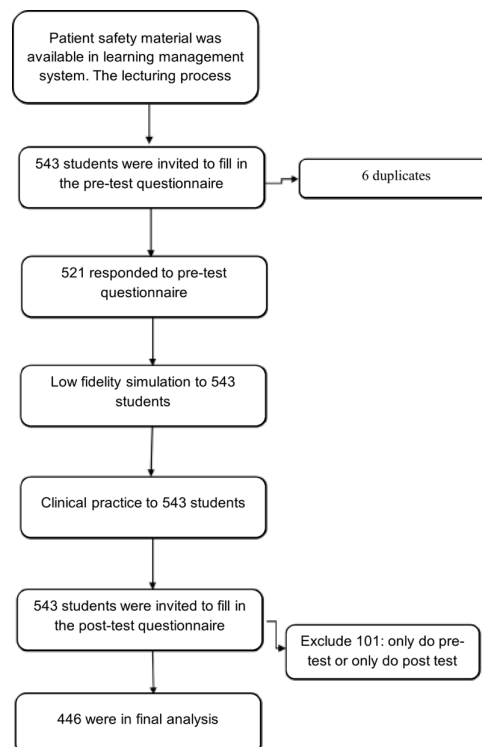


Figure 1. The study process flow chart

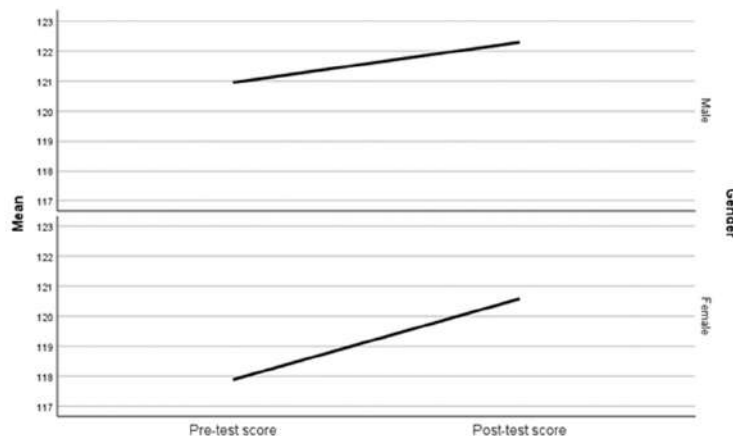


Figure 2. Mean Pre- and Post-Test Scores of WHO Patient Safety Questionnaire by Gender

making errors (3.01 [0.83] vs. 3.28 [0.93], $t = -5.63$, $p < 0.001$), the perception that errors are common in hospitals (3.30 [0.88] vs. 3.48 [0.89], $t = -3.92$, $p < 0.001$), and views regarding being blamed for giving the wrong drug (3.21 [0.94] vs. 3.09 [2.25], $t = 2.25$, $p < 0.05$). In Section 3 (ability to influence patient safety), three items showed significant improvements: willingness to tell others about errors (2.94 [0.96] vs. 3.21 [0.97], $t = -5.43$, $p < 0.001$), confidence in speaking up (3.38 [0.91] vs. 3.55 [0.89], $t = -3.28$, $p = 0.001$), and perceived ability to ensure patient safety (3.74 [0.93] vs. 3.84 [0.89], $t = -2.02$, $p < 0.05$). For Section 4 (personal attitudes to patient safety), only the item related to learning from mistakes showed a significant difference before and after the intervention (4.54 [0.63] vs.

4.46 [0.64], $t = 2.16$, $p < 0.05$). In Section 5 (safety in the workplace), significant differences were found for the items "nurses identify and address patient safety issues" (4.52 [0.58] vs. 4.46 [0.60], $t = 1.99$, $p < 0.05$) and "support from healthcare managers" (3.52 [0.80] vs. 3.71 [0.81], $t = -3.92$, $p < 0.001$).

Overall, most items showed higher mean scores after the intervention, except for the items related to learning from mistakes and nurses identifying and addressing patient safety issues, which showed slightly lower post-intervention scores.

The mean score of patient safety between students' gender and educational background is shown in Figures 2 and 3. After the intervention, the mean score is higher for both females and males. Patient safety awareness scores also increased after

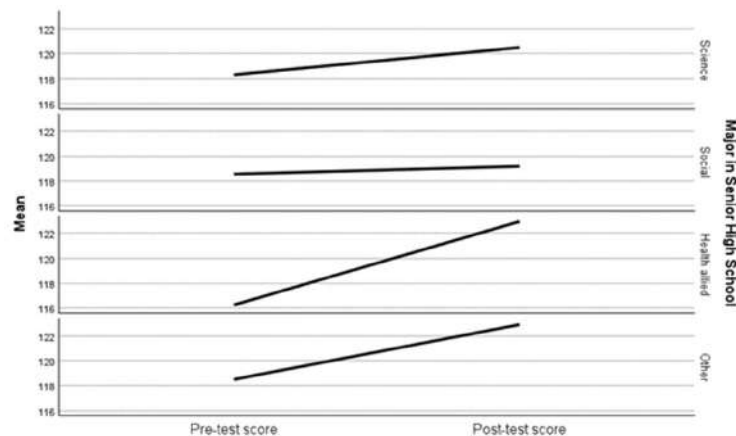


Figure 3. Mean Pre- and Post-Test Scores of WHO Patient Safety Questionnaire by Major in Senior High School

intervention across all educational backgrounds. However, students with a social science as their major in senior high school show only minimal improvement, with their score increasing by one point, from 118 to 119.

Discussion

Our results indicate that the awareness of patient safety is increasing significantly after low-fidelity simulation learning and clinical practice in nursing students. The total scores increased from pretest to post-test. The most notable gains were observed in knowledge of patient safety, understanding of the healthcare system's role in safety, and students perceived ability to influence patient safety. This study contributes to the growing of patient safety research by examining a structured low-fidelity simulation training and clinical practice exposure in first year nursing students, particularly in Indonesian context still limited.

A structured low-fidelity simulation training and clinical practice increases the patient safety awareness in this study. This result was similar to several previous studies about using simulation to enhance patient safety in nursing students (Hauff et al., 2025; Löber et al., 2020). This finding is supported by previous studies about enhancing patient safety using clinical practice (Bandansin et al., 2022). However, none of these studies mix simulation and clinical practice. Through simulation learning and clinical practice, nursing students faced both the realistic scenario and the real world of taking care of patients while also implementing the crucial of patient safety. As Durham and Alden (2008) mentioned, nursing education can use various simulations to enhance patient safety, including low fidelity, simulated patients, etc. However, limited studies have been reported in combination with clinical practice.

The knowledge about patient safety was significantly higher after the intervention in this study. First-year nursing students have limited

understanding and unclear knowledge about patient safety. However, previous research found that first-year students had overconfidence about patient safety (Bressan et al., 2021), which can also be found in this study. The first-year nursing students with high patient safety scores may not reflect actual competence (Bressan et al., 2021). In this study, they choose 3 or 4 out of 5 from the scale in knowledge dimensions. Before joining the intervention, they only received knowledge about patient safety from lectures, handouts, and self-learning. However, from the bivariate analysis, it can be found that the simulation and clinical practice have a positive impact on increasing their knowledge about patient safety (Bressan et al., 2021; Durham & Alden, 2008; Elendu et al., 2024).

The ability to influence patient safety was the second section of the patient safety questionnaire, showing a higher significant difference after intervention in this study. Before the intervention, first-year nursing students have a low ability to influence patient safety due to a lack of confidence. A previous study revealed that sufficient knowledge about patient safety boosts their confidence in talking about patient safety (Shin & Baek, 2023). The significance of the ability score increases as the students follow the simulation and clinical practice, as reported by a recent review (Kohanová et al., 2023).

Safety of the healthcare system was the last dimension to show a significant difference before and after the intervention. Although the score increased slightly, the students improved their perception of this issue following simulation and clinical practice. First-year nursing students lack knowledge of how the healthcare systems, including organizational structure, training, and policy, can affect patient safety. First-year nursing students never see the real world of safety in the healthcare system (Ramírez-Torres et al., 2023), so their score before intervention may reflect their perception of what the healthcare system faces in patient safety. This modest improvement indicates that simulation and

clinical practice learning methods shape students' awareness of patient safety in healthcare systems.

The interesting finding in this study is that item 11, "Unusual given the wrong drug" was significantly lower after the intervention. After simulation and clinical practice, the students became more aware that giving the wrong medication is not rare. Rather than indicating this result as a negative outcome, this shift can actuate how nursing students can be more realistic that giving the wrong medication can happen while caring for patients. As revealed in a previous study, nursing students contribute to the high medication errors in clinical practice (Stolic et al., 2022).

After the intervention, item "learning from mistakes" showed a decrease in score. In this study, nursing students in clinical practice were under the full supervision of clinical educators for every action and contact with patients. Full supervision was carried out to maintain patient safety during care and ensure students made no mistakes. Patient safety violations can severely affect patients and nursing students (Higham & Vincent, 2021). The consequences of mistakes make students less likely to be involved in carrying out patient safety goals during clinical practice because they are afraid of making mistakes. Previous research found that the fear of making mistakes is related to reactions to mistakes. Students who have high self-confidence are more likely to be able to correct their mistakes after getting feedback (Lauzier & Bilodeau Clarke, 2024). However, if students do not get enough feedback, they have difficulty identifying the cause of their mistakes. So, the process of learning from mistakes is hindered. Previous research has found that feedback is crucial in helping students identify errors (Zhang & Fiorella, 2023). Therefore, clinical educators need to understand how to give feedback and what type of feedback to give so that they can create a clinical practice environment that facilitates students to understand their mistakes and make improvements.

In the statement section, nurses identify and address patient safety. Although there is a significant difference, the average score decreases after the intervention. This indicates that students become realistic about nurses' roles in recognizing and addressing patient safety issues after seeing the complexity of practice in the clinic. These findings align with Stolic et al. (2022), who mentioned that students experience disharmony between academic ideals and clinical realities, such as a culture of silence and a lack of courage to report mistakes.

Another interesting finding was the significant increase in perceived support from healthcare managers after the intervention. Students realized the important role of managers in creating an environment that supports patient safety, especially when they saw real interactions between nurses during clinical practice. Support from healthcare managers is an important factor in fostering a culture of patient safety, especially for novice

practitioners such as nursing students (Järvisalo et al., 2024). The involvement of instructors and clinical managers in guiding nursing students through reflective questioning and critical thinking significantly increased students' awareness of patient safety risks and prevention strategies. Managers who provide a culture of transparency and non-punitive behaviour encourage students to report near misses and errors, which promotes learning that is important for patient safety (Park & Yeom, 2025). The support of healthcare managers and full supervision by clinical educators will create a structured and psychologically safe environment where nursing students can confidently engage in patient care while applying patient safety principles.

The nursing students with science and nursing majors in senior high school showed a higher awareness of patient safety than those with social majors. A previous study only found that first-year students entering medical school, including medicine and nursing, had higher sensitivity and motivation about patient safety than non-medical students (Kohara et al., 2024). These findings suggest that students from a science background show initial interest in the nursing profession and patient safety. A more focused approach to interest in nursing study is important to non-science students before entering nursing school.

Implication of the study

The findings of this study highlight important implication for nursing education and practice. The use of low-fidelity simulation combined with clinical practice was shown to enhance first-year nursing student's awareness of patient safety, supporting its integration into nursing curricula, especially in courses with clinical practice components. In addition, early exposure simulation-based learning in the first year enables nursing students to experience situations that closely resemble real word of clinical practice and to apply patient safety principle while performing basic nursing skills, which may help reduce error in future.

Limitation of the study

This study acknowledges several limitations. First, the results can only be generalized to the same characteristics. Even though patient safety is a broad topic in health sciences, students from different majors are limited to generalizing the results. However, the number of respondents who participated in this study was large, strengthens the study by increasing the robustness of the findings within this population. Second, variations in clinical placement across different inpatient wards may affect their responses to the questionnaire. Nonetheless, placement in inpatient ward ensured that students were exposed to relatively similar clinical settings and patient conditions. Lastly, the instrument used in this study was not formally cross-validated in Indonesian context. However, as it adapted from WHO patient safely curriculum, which

designed to compressively address key aspects of patient safety.

Conclusions

This study concludes that low-fidelity simulation and clinical practice significantly improve patient safety awareness in first-year nursing students. The students gained better understanding, confidence, attitudes, and thoughts about patient safety in real hospital situations. However, first-year nursing students may report higher scores that do not reflect their competence in patient safety, as they tend to rely more on theoretical knowledge rather than real clinical experience. Given this study relied on self-reported measures, which may not reflect actual awareness of patient safety, a qualitative study about the perception of patient safety is recommended in future research to gain deeper into nursing students understanding and the application of patient safety principles in clinical setting. This study also highlighted the importance of preparing a non-science education background to enhance patient safety.

Declaration of Interest

The authors declare there are no conflicts of interest related to this study.

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Data Availability

The data was available in request based on consideration.

References

- Afriani, T., Hariyati, S., Tutik, R., Yetti, K., Handiyani, H., & Rahman, L. O. A. (2022). Differences of patient safety goal's implementation between five accredited hospitals in Jakarta, Indonesia. *Malaysian Journal of Medicine & Health Sciences*, 18. https://medic.upm.edu.my/upload/dokumen/202212142228081_0052.pdf
- Agency for Healthcare Research and Quality. (n.d.). Nursing and patient safety. <https://psnet.ahrq.gov/primer/nursing-and-patient-safety>
- Al-Nawafleh, A. H., Musleh, S., & Nawafleh, N. (2024). The patient safety curriculum: An interventional study on the effectiveness of patient safety education for Jordanian nursing students. *PloS One*, 19(5), e0292713. <https://doi.org/10.1371/journal.pone.0292713>
- Bandansin, J., Jamjuree, D., Boonprakob, M., & Chaleoykitti, S. (2022). Development of a clinical learning model to enhance patient safety awareness competency among Thai nursing students. *Belitung Nursing Journal*, 8(2), 153–160. <https://doi.org/10.33546/bnj.1996>
- Bressan, V., Causero, G., Stevanin, S., Cadorin, L., Zanini, A., Bulfone, G., & Palese, A. (2021). Nursing students' knowledge of patient safety and development of competences over their academic years: Findings from a longitudinal study. *Slovenian Journal of Public Health*, 60(2), 114–123. <https://doi.org/10.2478/sjph-2021-0017>
- Danielsen, A. K., Pommergaard, H.-C., Burcharth, J., Angenete, E., & Rosenberg, J. (2015). Translation of questionnaires measuring health related quality of life is not standardized: A literature-based research study. *PLOS ONE*, 10(5), e0127050. <https://doi.org/10.1371/journal.pone.0127050>
- Dimitriadou, M., Merkouris, A., Charalambous, A., Lemonidou, C., & Papastavrou, E. (2021). The knowledge about patient safety among undergraduate nurse students in Cyprus and Greece: A comparative study. *BMC Nursing*, 20(1), 110. <https://doi.org/10.1186/s12912-021-00610-6>
- Donaldson, L. J. (2020). Safer care: Shaping the future. In W. Ricciardi, S. Sheridan, & R. Tartaglia (Eds.), *Textbook of Patient Safety and Clinical Risk Management* (pp. 53–66). Springer. <https://www.ncbi.nlm.nih.gov/books/NBK585622>
- Durham, C. F., & Alden, K. R. (2008). Enhancing patient safety in nursing education through patient simulation. In R. G. Hughes (ed.), *Patient safety and quality: An evidence-based handbook for nurses. Agency for Healthcare Research and Quality*. <https://www.ncbi.nlm.nih.gov/books/NBK2628/>
- Elendu, C., Amaechi, D. C., Okatta, A. U., Amaechi, E. C., Elendu, T. C., Ezech, C. P., & Elendu, I. D. (2024). The impact of simulation-based training in medical education: A review. *Medicine*, 103(27), e38813. <https://doi.org/10.1097/MD.00000000000038813>
- Farley, D., Zheng, H., Rousi, E., & Leotsakos, A. (2015). Field test of the World Health Organization multi-professional patient safety curriculum guide. *PLOS ONE*, 10(9), e0138510. <https://doi.org/10.1371/journal.pone.0138510>
- Ghosh, J., Binti Said, F. Mohd., & Panduragan, S. L. (2024). Impact of online nursing education on nursing students' knowledge, and attitude towards patient safety in India: An interventional study. *Malaysian Journal of Nursing*, 16(Suppl 1), 141–149. <https://doi.org/10.31674/mjn.2024.v16isupp1.014>
- Graf, C., Rüst, C. A., Koppenberg, J., Filipovic, M., Hautz, W., Kaemmer, J., & Pietsch, U.

- (2024). Enhancing patient safety: Detection of in-hospital hazards and effect of training on detection (by training in a low-fidelity simulation room of improvement based on hospital-specific CIRS cases). *BMJ Open Quality*, 13(2), e002608. <https://doi.org/10.1136/bmjopen-2023-002608>
- Hauff, V., Homann, L., & Tannen, A. (2025). Simulative learning in the room of horror—a method to enhance patient safety in undergraduate nursing education. *GMS Journal for Medical Education*, 42(2), Doc19. <https://doi.org/10.3205/zma001743>
- Higham, H., & Vincent, C. (2020). Human error and patient safety. In L. Donaldson, W. Ricciardi, S. Sheridan, & R. Tartaglia (Eds.), *Textbook of Patient Safety and Clinical Risk Management*. Springer. <https://www.ncbi.nlm.nih.gov/books/NBK585626/>
- Higham, H., & Vincent, C. (2021). Human error and patient safety. In L. Donaldson, W. Ricciardi, S. Sheridan, & R. Tartaglia (Eds.), *Textbook of patient safety and clinical risk management*. Springer. https://doi.org/10.1007/978-3-030-59403-9_3
- Järvisalo, P., Haatainen, K., Von Bonsdorff, M., Turunen, H., & Härkänen, M. (2024). Interventions to support nurses as second victims of patient safety incidents: A qualitative study of nurse managers' perceptions. *Journal of Advanced Nursing*, 80(6), 2552–2565. <https://doi.org/10.1111/jan.16013>
- Kohanová, D., Bartoníčková, D., Kurucová, R., & Žiaková, K. (2023). Factors influencing nursing students' perception of patient safety. *Kontakt*, 25(4), 266–275. <https://doi.org/10.32725/kont.2023.040>
- Kohara, S., Miura, K., Sasamori, C., Hase, S., Shu, A., Kasai, K., Yokoshima, A., Fujishiro, N., & Otaki, Y. (2024). A comparative study on patient safety awareness between medical school freshmen and age-matched individuals. *Healthcare*, 12(22), 2270. <https://doi.org/10.3390/healthcare12222270>
- Lauzier, M., & Bilodeau Clarke, A. (2024). Linking learning goal orientation to learning from error: The mediating role of motivation to learn and metacognition. *European Journal of Training and Development*, 48(5/6), 485–500. <https://doi.org/10.1108/EJTD-11-2022-0127>
- Levett-Jones, T., Andersen, P., Bogossian, F., Cooper, S., Guinea, S., Hopmans, R., McKenna, L., Pich, J., Reid-Searl, K., & Seaton, P. (2020). A cross-sectional survey of nursing students' patient safety knowledge. *Nurse Education Today*, 88, 104372. <https://doi.org/10.1016/j.nedt.2020.104372>
- Löber, N., Garske, C., & Rohe, J. (2020). Room of horrors – a low-fidelity simulation training for patient safety–relevant hazards in everyday clinical practice [Room of horrors – ein low-fidelity Simulationstraining für patientensicherheitsrelevante Gefährdungspotentiale im Klinikalltag]. *Zeitschrift Für Evidenz, Fortbildung Und Qualität Im Gesundheitswesen*, 153–154, 104–110. <https://doi.org/10.1016/j.zefq.2020.05.010>
- Massoth, C., Röder, H., Ohlenburg, H., Hessler, M., Zarbock, A., Pöpping, D. M., & Wenk, M. (2019). High-fidelity is not superior to low-fidelity simulation but leads to overconfidence in medical students. *BMC Medical Education*, 19(1), 29. <https://doi.org/10.1186/s12909-019-1464-7>
- Park, H.-Y., & Yeom, I. (2025). Effects of patient safety education programs on nursing students' knowledge, attitude, and competency with patient safety: A systematic review, meta-analysis, and meta-regression. *Nurse Education Today*, 150, 106675. <https://doi.org/10.1016/j.nedt.2025.106675>
- Ramírez-Torres, C. A., Rivera-Sanz, F., Cobos-Rincon, A., Sufrate-Sorzano, T., Juárez-Vela, R., Gea-Caballero, V., Tejada Garrido, C. I., Colado Tello, M. E., Durante, A., & Santolalla-Arnedo, I. (2023). Perception of patient safety culture among nursing students: A cross-sectional study. *Nursing Open*, 10(12), 7596–7602. <https://doi.org/10.1002/nop2.1995>
- Shahzeydi, A., Dianati, M., & Kalhor, F. (2024). Clinical simulation in nursing students' safe medication administration: A systematic review. *Iranian Journal of Nursing and Midwifery Research*, 29(5), 522–529. https://doi.org/10.4103/ijnmr.ijnmr_323_23
- Shin, S.-H., & Baek, O.-J. (2023). Experiences of patient safety education and factors affecting the willingness to participate in patient safety in undergraduate nursing students in South Korea. *Healthcare (Basel, Switzerland)*, 12(1). <https://doi.org/10.3390/healthcare12010054>
- Stolic, S., Ng, L., Southern, J., & Sheridan, G. (2022). Medication errors by nursing students on clinical practice: An integrative review. *Nurse Education Today*, 112, 105325. <https://doi.org/10.1016/j.nedt.2022.105325>
- Suryani, L., Letchmi, S., & Binti Moch Said, F. (2022). Patient safety culture in nurses in karawang, Indonesia: A cross-sectional study. *KnE Life Sciences*. <https://doi.org/10.18502/kls.v7i2.10299>
- Triantafyllou, C., Gamvrouli, M., & Myrianthefs, P. (2023). Frequency of nursing student medication errors: A systematic review. *medRxiv*. <https://doi.org/10.1101/2023.02.26.23286460>
- Walton, M., Woodward, H., Van Staaldunen, S., Lemer, C., Greaves, F., Noble, D., Ellis, B., Donaldson, L., & Barraclough, B. (2010). The WHO patient safety curriculum guide for medical schools. *BMJ Quality & Safety*, 19(6), 542–546. <https://doi.org/10.1136/qshc.2009.036970>
- World Health Organization. (2011). Patient safety

- curriculum guide: Multi-professional edition. <https://creativecommons.org/licenses/by-nc-sa/3.0/igo/>
- World Health Organization. (2023). Patient Safety. <https://www.who.int/news-room/fact-sheets/detail/patient-safety>
- World Health Organization. (2024). Global patient safety report 2024. <https://www.who.int/publications/i/item/9789240095458>
- Zhang, Q., & and Fiorella, L. (2023). An integrated model of learning from errors. *Educational Psychologist*, 58(1), 18–34. <https://doi.org/10.1080/00461520.2022.2149525>

Difference in neonatal hemoglobin levels between delayed and direct umbilical clamping

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Abstract

Background: Anemia is globally considered a public health problem due to its adverse impact on physical, cognitive, motor, and behavioral development during infancy and childhood. The prevalence of anemia in the first year of life reaches 50%.

Purpose: Procedures that can be performed during childbirth to increase the iron stores of newborns and contribute to the prevention of anemia by delaying cord cutting.

Methods: This study was a quantitative study with a quasi-experimental Posttest Only Control Group Design with an uneven control group. The research was conducted in the Lubuk Kambing Health Center Working Area in February-March 2024 with a total sample of 40 full-term babies who were selected using the total sampling technique and divided into intervention groups (delayed cord clamping) and control (immediate clamping). Data analysis used the Mann-Whitney U test with a 95% confidence level ($\alpha = 0.05$).

Results: The average hemoglobin level performed by Delay Cord Clamping was 17.3 g/dl with a minimum value of 12.5 and a maximum value of 21.4 g/dL and that not performed by Delay Cord Clamping was 15.3 g/dl with a minimum value of 13.5 and a maximum of 19.2 g/dL. The results of the statistical test showed a p value of 0.007 < 0.05 which means that there is a significant difference in hemoglobin between Delay Cord Clamping and no Delay Cord Clamping.

Conclusion: Delayed cord clamping has a significant effect on increased neonatal hemoglobin levels. These findings confirm that delayed cord clamping practices can be integrated as part of obstetric and nursing care standards in normal childbirth to support the prevention of anemia from an early age. Nurses and midwives play a role in implementing these evidence-based procedures, conducting antenatal education for pregnant women, and ensuring optimal monitoring of neonatal conditions to improve the quality of maternal and neonatal services.

Keywords: anemia; babies; infant development; delayed cable clamping; hemoglobin levels.

Introduction

One of the most significant public health problems around the world is anemia, which is defined as a low concentration of blood hemoglobin. For public health interventions, the identification of anemia is critical. In 2011, an estimated 273 million children under the age of 5 worldwide developed anemia, with about 50% of these cases due to iron deficiency (Stevens et al., 2013).

Figure 1 illustrates the estimated global prevalence of anemia as a public health problem in infants and children aged 6-59 months in 2011 (Sundararajan & Rabe, 2021).

Anemia is a condition in which there are not enough red blood cells circulating to meet the body's oxygen and physiological needs. It affects hematological status, impairs cognitive and physical development, reduces

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learning capacity, and decreases productivity, making it an important indicator of poor nutrition and health (Haas & IV, 2001). Various factors such as malnutrition, infection, inflammation, blood loss, and genetic hemoglobin disorders can lead to anemia, but iron deficiency remains the most common cause globally. Iron deficiency anemia contributes to perinatal defects and complications, including stillbirth, prematurity, and low birth weight (McLean et al., 2009).

Delayed cord clamping within 1 to 3 minutes after birth allows placental transfusion and iron-rich blood flow to the newborn, which can prevent premature anemia by facilitating placental transfusion, increased circulating blood volume (up to 100 ml). It is advantageous for neonates to allow blood flow from the placenta to the newborn as the baby transitions to life outside the womb. A delay in cutting the umbilical cord can be achieved by waiting for about one to three minutes, the umbilical cord is usually clamped within fifteen seconds of birth. DCC interventions are simple, inexpensive, and can save lives if implemented correctly. In addition, placental transfusions can be performed through cord milking through a cut umbilical cord, also known as UCM. Milking is the process of manually removing blood from the umbilical cord. This is done by actively squeezing or squeezing blood through a short segment of the umbilical cord (20-30 cm) that is cut (cut the umbilical cord) or attached (intact umbilical cord) to the placenta 3-4 times at a rate of 10 cm per second before clamping the umbilical cord. In cases of hypoxian to full-term labor, UCM can serve as an alternative to DCC because it provides additional blood volume through the accelerated process of placental transfusion without interfering with timely resuscitation efforts (Kim & Warren, 2015; Tonse NK Raju, MD, DCH, 2013; Katheria, Brown, et al., 2017; Katheria, Lakshminrusimha, et al., 2017; Basile et al., 2019).

The novelty of this study lies in an in-depth analysis of the effect of delayed umbilical cord clamping on newborn hemoglobin levels in the work area of the Lubuk Kambing Health Center, which has not been widely studied in this field. This study used a quasi-experimental approach with a Posttest Only Control Group design, which provides strong evidence of the significant benefits of this procedure in improving neonatal hemoglobin levels.

The significance of this study is to show that simple, low-cost procedures such as delayed umbilical cord clamping can significantly improve the hemoglobin status of newborns, thereby potentially reducing the prevalence of anemia in infants in the early months of their lives. Anemia in newborns can adversely affect a child's cognitive, motor, and immune development, ultimately affecting their future quality of life. By increasing hemoglobin levels through delayed cord clamping, babies have better iron reserves to support optimal brain growth and development. In addition, this study also makes an important contribution in educating health

workers about the benefits of delayed cord clamping practices. The implementation of the results of this study can encourage changes in the standards of childbirth procedures in health facilities, including health centers, so as to provide long-term benefits for the health of mothers and babies. The results of this study are also relevant for the development of broader public health policies, especially in efforts to prevent iron deficiency anemia which is still a global health problem (Andersson et al., 2015; McDonald et al., 2014; Yoon et al., 2023; Mercer et al., 2018).

The study adds to scientific evidence supporting recommendations from international health organizations, including the World Health Organization (WHO), which advocate delayed cord clamping (DCC) to improve iron status and prevent anemia in newborns (World Health Organization, 2014). Randomized clinical trials and systematic reviews have shown that DCC significantly increases hemoglobin levels and iron reserves early in life, and has the potential to provide long-term benefits for children's neurocognitive development (Andersson et al., 2015; McDonald et al., 2014).

An initial survey of 10 infants, five receiving delayed umbilical cord clamping and five direct clamping showed that infants with delayed cord clamping had higher average hemoglobin levels, with an average difference of 2.2 g/dL. Implementing delayed cord clamping as an anemia prevention strategy requires coordination between healthcare providers and community support. This study aims to describe hemoglobin levels in newborns who receive delayed versus direct cord clamping and to determine the effect of delayed cord clamping on newborn hemoglobin levels in the Lubuk Kambing Health Center area in 2024.

Materials and Methods

Study Design

This research is a quantitative research. The research design used is Quasy Experimental with a Posttest Only Control Group Design approach.

Population, Sampling, and Sampling

This research was conducted in the working area of the Lubuk Kambing Health Center, Jambi, in February-March 2024. The research sample included all babies born in that period using the total sampling technique, so that the entire population that met these criteria was used as study respondents. The number of samples obtained was 40 infants, which were then divided into two groups, namely 20 infants in the intervention group (delayed cord clamping) and 20 infants in the control group (immediate cord clamping). The use of total sampling was chosen because the number of births during the study period was relatively limited, so all subjects who met the criteria were included to minimize selection bias and improve data representation. In addition, this sample count has met the minimum requirements of comparative analysis from two independent groups with a quasi-

Table 1. Demographic characteristics of respondents

Characteristics	Group	n	%
Equivalence	1	15	37.5
	2	25	62.5
Age	20-35	40	100
Age Pregnancy	37-38 weeks	5	5
	38-39 Weeks	21	52.5
	39-40 weeks	17	42.5
Up to Hb	<11 g/dL	6	15
	≥11 g/dL	34	85
	Quantity	40	100

Table 2. Average distribution of newborn hemoglobin levels

Variable	n	Middle	Minimum	Maximum
Delayed hemoglobin levels in newborns Cable Clamping	20	17.3	12.5	21.4
Undelayed hemoglobin levels in newborns, cord clamping	20	15.3	13.5	19.2

Table 3. Effects of delayed cord clamping on neonatal hemoglobin levels

Intervention	Means	Average Rating	P-Value
Cable Clamp Delay	17.3	25.5	0.007
No cable clamping delay	15.3	15.5	

experimental design to detect mean differences with a 95% confidence level and adequate testing strength at a significance level of 0.05.

Inclusion criteria included newborns with normal conditions and full gestational age. Exclusion criteria are infants with congenital abnormalities as well as infants who have complications such as succedaneum caput and umbilical cord circumference. The independent variable in this study was delayed cord clamping, while the dependent variable was newborn hemoglobin levels.

Instruments

All instruments used in the study "Effect of Delayed Umbilical Cord Clamping on Hemoglobin Levels in Newborns" have gone through a systematic validation process. Hemoglobin levels were measured using the EasyTouch Hb digital hemoglobinometer, which has good validity and reliability based on comparative tests with standard laboratory methods (cyanmethemoglobin method). Before use, the device is calibrated according to the manufacturer's instructions and internal quality control tests are performed to ensure the consistency and accuracy of the measurement results. Measurements are carried out by trained health workers to minimize procedural errors (measurement bias).

The observation sheets and data collection forms undergo a content validity test through assessment by a panel of experts consisting of coordinating midwives and primary service doctors. An assessment was carried out on the suitability of

the indicators with the research variables, language clarity, and completeness of observation items. The results of the evaluation showed that all items were declared relevant and represented the constructed being measured. In addition, a face validity test is performed to ensure that the instrument is easy to understand and can be used consistently by enumerators. To ensure the consistency of data filling, an equitable distribution of perception (inter rater agreement) was carried out through enumerator training before the study began.

Delayed cord clamping procedures were performed in accordance with national Standard Operating Procedures (SOPs) and evidence-based practice guidelines, thereby improving the validity of the intervention and reducing treatment variation between subjects.

Procedure

The research preparation stage began with the collection of data on pregnant women with an estimated delivery date in February-March 2024 in the working area of the Lubuk Kambing Health Center, Jambi. The researchers noticed the similarities in characteristics between the intervention group and the control group through the establishment of inclusion and exclusion criteria. Respondents who met the criteria were then assigned to the intervention group (delayed cord clamping) and control group (direct cord clamping).

Before the study was conducted, the researcher explained to the baby's parents about the purpose

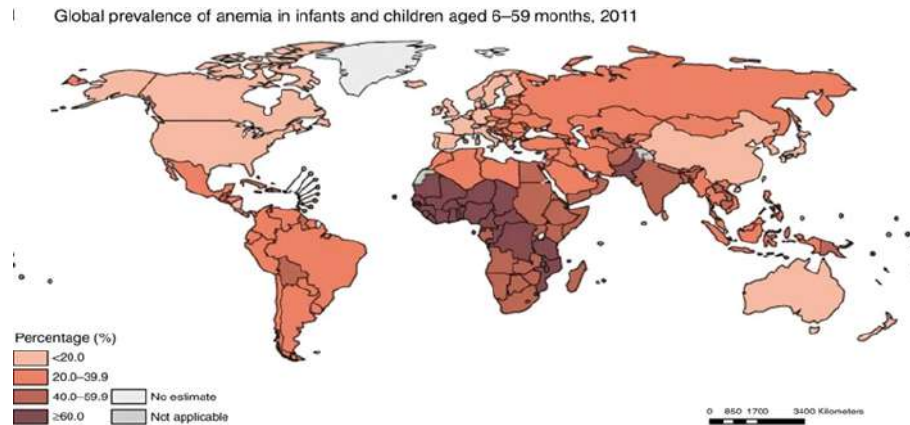


Figure 1. illustrates the estimated global prevalence of anemia as a public health problem in infants and children aged 6-59 months in 2011 (Sundararajan & Rabe, 2021).

of the research and the procedure for checking hemoglobin levels. Consent to participate is obtained through the signing of an informed consent by the respondent's parents. This research has received ethical approval from the Health Research Ethics Commission, Faculty of Medicine and Health Sciences, University of Jambi with an ethics certificate number 23/UN21.8/PT.01.04/2024.

To maintain the consistency of the research implementation, the researcher conducted a briefing to three village midwives who acted as enumerators. Perception equity includes research objectives, delayed cord clamping procedures, as well as blood sampling techniques for hemoglobin testing.

Delayed cord clamping intervention is performed by waiting for 2 minutes after the baby is born spontaneously before clamping is performed. Blood sampling is done on the first day after birth, along with a congenital hypothyroid screening examination as a standard procedure in newborns. The researchers conducted observations during and after the intervention to minimize potential bias. In the final stage, the results of the hemoglobin level examination were compared between the infant group with delayed umbilical cord clamping and the group with immediate clamping.

Data Analysis

The researcher conducted data analysis using IBM SPSS Statistics for Windows software (IBM Corp., Armonk, NY, USA), version 26.0, with the official license of the institution in force at the time of the study. The analytical test used was the Mann-Whitney U test to compare the differences in hemoglobin levels between the two independent groups. The confidence level is set at 95% with a limit of statistical significance $\alpha = 0.05$.

Results

Univariate Analysis

Respondent Characteristics

Based on table 1, it is known that the characteristics of most of the respondents have parity of 2 as many as 25 (62.5%) of respondents, 100% of non-risk age 20-35 years, gestational age of 21 (52.5%) respondents and hemoglobin levels ≥ 11 g/dL of 34 (85.0%) respondents.

Overview of hemoglobin levels in newborns

Based on the distribution of hemoglobin levels in newborns carried out with Delay Cord Clamping 2024, it is known that the average hemoglobin level is 17,320 g/dl with a minimum value of 12.5 and a maximum of 21.4 g/dL. Hemoglobin levels in newborns who did not undergo Delayed Umbilical Clamping are known to have an average hemoglobin level of 15,340 g/dL with a minimum value of 13.5 and a maximum of 19.2 g/dL.

Bivariate Analysis

Based on the results of the analysis, it is known that the average hemoglobin level carried out by Delay Cord Clamping is 17,320 g/dl with an average rating of 25.48 g/dl while in the Delay Cord Clamping record the average hemoglobin level is 15,340 g/dl with an average rating of 15.53 g/dl. The results of the statistical test found that the p-value was $0.007 < 0.05$, so it can be concluded that there is a significant difference between delay cable clamping and no delay cable clamping.

Discussion

This study evaluated neonatal outcomes after DCC in full-term pregnancy. Our study showed that the

International Organization Statement on the Right Time for Rope Clamps

Organizations and/or Associations of Professions and Scientific Groups	Statement	References
World Health Organization	In preterm infants, delaying cord clamping for 30-120 seconds appears to be associated with less need for blood transfusions and less intraventricular bleeding. The beneficial effects of delayed cord clamping can result in the greatest benefits in settings where access to health care is limited "For full-term babies:" To reduce the risk of postpartum bleeding in mothers, the WHO recommends cord clamping after observation of uterine contractions about three minutes after birth. For babies, there is growing evidence that delayed cord clamping is beneficial and can improve iron status up to six months after birth. This may be especially relevant for babies living in low-resource environments with less access to iron-rich foods.	(World Health Organization, 2004)
Canadian Association of Obstetricians and Gynaecologists	If possible, delaying cord clamping for at least 60 seconds is better than premature clamping in preterm infants (< 37 weeks of pregnancy) because there is less intraventricular bleeding and less need for transfusions in babies with late clamping.	(Leduc et al., 2009)
European Neonatology Panel Consensus Guidelines	If possible, delay cord clamping for at least 30-45 seconds with the baby held under the mother to correct the placenta-fetal transfusion: Level of evidence, A	(Sweet et al., 2010)
International Liaison Committee for Resuscitation	Newborns who do not require resuscitation are advised to delay cord clamping for at least one minute.	(Perlman et al., 2010)

DCC of full-term infants who received delayed cord clamping had better mean hemoglobin levels of 17,320 g/dl with a minimum value of 12.5 and a maximum of 21.4 g/dl compared to neonatal without DCC of 15,340 g/dl with a minimum value of 13.5 and a maximum of 19.2 g/dl.

As soon as the baby cries loudly and until the umbilical cord is no longer throbbing inside the baby, pinching the umbilical cord can increase the blood volume by about fifty milliliters. On the other hand, pinching the umbilical cord ten to fifteen seconds after birth can prevent most of the iron from entering the baby's body (Bersalin et al., 2016).

If the umbilical cord is not cut immediately, the baby can still receive a placental transfusion in the form of an additional blood of about 50 to 100 milliliters. Delaying cord cutting can increase the baby's blood volume by up to 30% and the number of red blood cells by up to 60%. The blood flow of fetoplasente will continue through the umbilical cord until the pulse stops, giving the baby the opportunity to obtain iron reserves derived from erythrocytes and hemoglobin (Garabedian et al., 2016).

The results of the statistical test found that the p value was 0.007 <0.05, so it can be concluded that there is a significant difference between Delay Cord Clamping and no Delay Cord Clamping. Compared to premature clamping, delayed cord clamping can give the newborn's lungs more time to breathe and thus provide a smoother transition to neonatal breathing (Dekker et al., 2018).

Several studies in babies less than one month old have shown that DCC increases infant

hemoglobin at birth and reduces the incidence of anemia (Yoon et al., 2023; Mohammad et al., 2021; Ofojebe et al., 2021; Enyinna et al., 2024). In full-term infants, a delay in clamping the umbilical cord for 1 minute after birth leads to an additional volume of up to 80 ml of blood from the placenta into the baby's circulation, which increases to 100 ml within 3 minutes of birth (World Health Organization, 2014). Delaying cord clamping for about 3 minutes provides an additional blood volume of 40 ml per Kg of body weight through placental transfusion with the potential to donate up to 75 mg of iron to a baby weighing 3 Kg, thus preventing iron deficiency in the first 6 months of the baby's life (McDonald et al., 2014).

Iron is essential for brain development, playing a key role in synaptogenesis, myelination, energy metabolism, and neurotransmitter production. If a deficiency occurs during a critical period of brain development, it can lead to permanent changes in brain structure and function that cannot be restored despite supplementation. Infants with perinatal iron deficiency have been shown to have delayed levels of nerve conduction, sleep pattern disorders, cognitive memory impairments, motor deficits and lower global developmental scores that may arise from the neonatal period and continue into adulthood (German & Juul, 2021).

The impact of iron deficiency anemia on infant and child mortality under the age of 5 Worldwide, the mortality rate has declined by nearly 50% from 12.4 million in 1990 to 5.9 million in 2015 (Liu, 2016). However, despite the worldwide decline,

the number of deaths is still highest during the neonatal period, or the first 28 days of life (Liu et al., 2015). Complications of preterm birth (0.965 million, 15.4%) and intradelivery complications (0.662 million, 10.5%), The leading causes of infant mortality are infectious diseases, including pneumonia and diarrhea (3.257 million, 51.8%) (Liu, 2016). Anemia contributes to child mortality through malnutrition and increased susceptibility to infection (Majid Ezzati et al., 2004).

The impact of iron deficiency anemia on brain development starts from delays in children's physical and mental development, decreased hearing and visual function. Anemia affects intelligence, perhaps with irreversible and lifelong consequences, with a deficit of 5-10 points in intelligence (Andersson et al., 2015; Pasricha et al., 2013). In addition, iron deficiency anemia at an early age can be associated with irreversible cognitive impairment, even after iron stores have been replenished (World Health Organization, 2011). Lozoff has shown that iron deficiency, in addition to causing hematologic abnormalities, also causes long-term neurocognitive impairment, with a negative impact on the psychomotor development of the baby. Iron is essential for learning and memory, including optimal brain processing speeds. Developing hippocamps are particularly susceptible to iron deficiency at an early age, which is one of the mechanisms that can lead to the negative effects of iron deficiency (Peter et al., 1999; Batra, 2005).

DCC serves as a low-cost intervention to reduce the risk of iron deficiency anemia (World Health Organization, 2014; Ashish et al., 2017). At 4 months of age, full-term infants who receive DCC have higher levels of ferritin and an increase in myelin in brain areas that are important for early functional development in life. A positive association between maternal iron stores reflected in plasma ferritin and infant plasma ferritin concentrations in the first 6 months was observed (Mercer et al., 2018). Results In a similar RCT of 276 mother-infant pairs, DCC at 3 minutes significantly increased serum ferritin levels in full-term infants at 6 months of age compared to the preterm clamping group with a 3-fold higher incidence of IDA among infants who received early cord clamping. In addition, DCC, when compared to early clamping, improves fine motor function at age 4, suggesting that optimizing cord clamping time has a positive impact on nerve development. Full-term infants benefit from increased Hb, increased iron stores, and better motor outcomes at age 4. The WHO recommends delayed cord clamping to reduce anemia in infants. DCC serves as a means of delivering iron, potentially reducing or eliminating the cost of iron supplementation (Sundararajan & Rabe, 2021).

Reported Benefits of Delayed Cord Pinching: Full-Term Infants (Raju & Singhal, 2012)

Hemoglobin is higher at the age of 4-12 months; Increased serum ferritin during the first year;

Increased overall body iron storage at one year of age; Improved malaria survival in endemic areas; Lowers circulating lead levels in areas with high air pollution

Reported Benefits of Delayed Pinching of the Belly Button: Premature Babies (Raju & Singhal, 2012)

Higher blood circulation volume for 24-48 hours; Reduces blood transfusions; Increased systemic blood pressure; Reduces the need for inotropic support; Increased blood flow in the superior vena cava; Increased output of the left ventricle; Higher cerebral oxygenation index; Lower frequency of intracranial bleeding; No IVH weight difference.

Babies born prematurely (before 37 weeks of pregnancy) have a high risk of death and severe morbidity due to immaturity of organs and body systems. Delayed cord clamping is an effective intervention to reduce mortality in preterm infants, with meta-analysis of data from our paired individual participants suggesting that delayed cord clamping reduces the likelihood of death before discharge compared to direct clamping (Wood, 2023; Ohuma et al., 2023). For premature babies, the transition from fetal breathing to neonatal breathing may take longer compared to full-term babies. Compared to premature clamping, delayed cord clamping can give more time for the newborn's lungs to breathe and thus provide a smoother transition to neonatal breathing. However, some babies, especially those born very prematurely (born before 28 weeks of gestation), may need immediate help with lung aeration or further resuscitation, which may be logistically difficult if the umbilical cord is still intact. In practice, many umbilical cord clamping strategies are available, including different times to clamp or milk the umbilical cord, this has led to recommendations in international guidelines to wait at least 60 seconds before clamping the umbilical cord in newborns who do not require respiratory assistance, whereas if stabilization or resuscitation is required, umbilical cord clamping is recommended immediately. In addition, a recent meta-analysis comparing different clamping strategies showed an effect on increased survival the most when clamping was delayed for 2 minutes or more (Dekker et al., 2018; de Pas et al., 2024).

According to the researchers' assumptions, delayed cord clamping can be done by placing the baby next to the mother because the lower position of the baby's placenta can increase blood flow from the placenta faster which is expected to increase the hemoglobin levels in the baby for 2 minutes, then IMD can be performed after the umbilical cord is severed. A baby's hemoglobin levels are not only affected by cord delay but can also be affected by several other factors such as blood loss, increased erythrocyte damage, or decreased erythrocyte production. Efforts that can be made to increase newborn hemoglobin levels must be

made starting from pregnancy where mothers who get balanced nutrition during pregnancy and do not experience anemia during pregnancy tend to get adequate nutritional intake, so pregnant women need to maintain a balanced diet and consume at least 90 tablets to increase blood during pregnancy. To increase knowledge to pregnant women, It is hoped that health workers can conduct counseling or counseling for pregnant women.

Research Limitations

The researcher should provide a detailed and repeated explanation of the hemoglobin test performed in conjunction with congenital hypothyroid screening. This study only used a sample of 20 respondents from each group, so it could not provide an accurate picture of the baby's hemoglobin levels due to delayed cord cutting. Researchers also need enumerators because of the long distance traveled and limited time. In addition, crying babies make mothers unfocused, so researchers have to wait for the baby to finish crying and until the condition is calm or conducive.

Conclusions

The study showed that delayed cord clamping (DCC) significantly increased neonatal hemoglobin levels compared to direct clamping, thus acting as a simple, low-cost intervention to increase initial iron stores and reduce the risk of iron deficiency anemia. In line with controlled clinical trial evidence and WHO recommendations, improved hemoglobin and ferritin status early in life has the potential to support long-term neurocognitive and motor developmental outcomes. Clinically, these findings support the integration of DCC (1-3 minutes in stable full-term neonates) into evidence-based obstetric and nursing practice standards, strengthening obstetric-neonatal protocols, and antenatal education on its benefits. Widespread implementation in primary services and hospitals can be a sustainable prevention strategy against early anemia. Large-scale research is needed to evaluate physiological aspects such as the position of the baby relative to the placenta, as well as its application to multiple pregnancies and premature neonatal to expand generalizations and clinical guidelines.

Declaration of Interest

The authors report no competing interests.

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Data Availability

None.

References

- Andersson, O., Lindquist, B., Lindgren, M., Stjernqvist, K., Domellöf, M., & Hellström-Westas, L. (2015). Effects of delayed cord clamping on nerve development at age 4: A randomized clinical trial. *JAMA Pediatrics*, 169(7), 631–638. <https://doi.org/10.1001/jamapediatrics.2015.0358>
- Ashish, K.C., Rana, N., Malqvist, M., Ranneberg, L.J., Subedi, K., & Andersson, O. (2017). Effect of delayed cord clamping vs early clamping on anemia in infants at 8 and 12 months of age, randomized clinical trial. *JAMA Pediatrics*, 171(3), 264–270. <https://doi.org/10.1001/jamapediatrics.2016.3971>
- Basile, S., Pinelli, S., Micelli, E., Caretto, M., & Benedetti Panici, P. (2019). Umbilical cord milking in preterm and term infants. *BioMed Research International*, 2019. <https://doi.org/10.1155/2019/9185059>
- Batra, J., & Sood, A. (2005). Iron deficiency anaemia: Effect on cognitive development in children. *Indian Journal of Clinical Biochemistry*, 20(2), 119–125. <https://doi.org/10.1007/BF02867410>
- Dekker, J., Hooper, S.B., Martherus, T., Cramer, S.G., van Geloven, N., & Pas, A.B. (2018). Repetitive tactile stimulation versus standard preterm infants at birth. *Psalm* 127, 37–43. <https://doi.org/10.1016/j.resuscitation.2018.03.030>
- Enyinna, K. K., Eleje, G. E., Odugu, B. B., Nevo, C. O., Ofor, J. J., Mbachu, I. I., Eze, C. C., Okoh, D. S., Ikwuka, D. C., Awkadiwe, F. I., Okafor, C. C., Okafor, C. C. (2024). Impact of early versus delayed cord clamping on time-term neonatal hemoglobin levels. *International Journal of Medical Research*, 52(6). <https://doi.org/10.1177/03000605241255836>
- Garabedian, C., Rakza, T., Drumez, E., Poleszczuk, M., Ghesquiere, L., Wibaut, B., Depoortere, M.H., Vaast, P., Storme, L., & Houfflin-Debarge, V. (2016). The benefits of cord clamping are delayed in red blood cell alloimmunization. *Pediatrics*, 137(3). <https://doi.org/10.1542/peds.2015-3236>
- German, K.R., & Juul, S.E. (2021). Iron and neurodevelopment in preterm infants: A narrative review. *Nutrition*, 13(11). <https://doi.org/10.3390/nu13113737>
- Haas, J. D., & Brownlie, T., IV. (2001). Iron deficiency and reduced work capacity. *The Journal of Nutrition*, 131(2), 676S–690S. <https://doi.org/10.1093/jn/131.2.676S>
- Katheria, A.C., Brown, M.K., Rich, W., & Arnell, K. (2017). Giving placental transfusions to newborns who need resuscitation. *Frontiers in Pediatrics*, 5 (January), 1–8. <https://doi.org/10.3389/fped.2017.00001>
- Katheria, A.C., Lakshminrusimha, S., Rabe, H., McAdams, R., & Mercer, J.S. (2017). Placental transfusion: A review. *Journal of Perinatology*,

- 37(2), 105–111. <https://doi.org/10.1038/jp.2016.151>
- Kim, A. J. H., & Warren, J.B. (2015). Optimal Timing of Umbilical Cord Clamping: Evidence in Premature and Full-Term Infants, Alternatives, and Unanswered Questions. *Neo Review*, 16(5), e270. <https://doi.org/10.1542/neo.16-5-e270>
- Leduc, D., Senikas, V., Lalonde, A.B., Ballerman, C., Biringer, A., Delaney, M., Duperron, L., Girard, I., Jones, D., Lee, L.S., Shepherd, D., & Wilson, K. (2009). Active management of the third stage of labour: Prevention and treatment of postpartum hemorrhage. *Canadian Journal of Obstetrics and Gynaecology*, 31(10), 980–993. [https://doi.org/10.1016/S1701-2163\(16\)34329-8](https://doi.org/10.1016/S1701-2163(16)34329-8)
- Liu, L., Oza, S., Hogan, D., Perin, J., Rudan, I., Lawn, J.E., Cousens, S., Mathers, C., & Black, R.E. (2015). Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: An updated systematic analysis. *The Lancet*, 385(9966), 430–440. [https://doi.org/10.1016/S0140-6736\(14\)61698-6](https://doi.org/10.1016/S0140-6736(14)61698-6)
- Ezzati, M., Lopez, A. D., Rodgers, A., & Murray, C. J. L. (Eds.). (2004). Comparative quantification of health risks: Global and regional burden of disease attributable to selected major risk factors (Vols. 1–2). World Health Organization.
- Materniti, D., Farich, A., & Schultz. (2016). Difference in the length of cord clamping on the level of haemoglobin (Hb) of newborns at the Mayjend Regional Hospital. Hm. Ryacudu Kotabumi, North Lampung in 2015. *Malahayati Journal of Midwifery*, 1(3), 148–154.
- Mcdonald, S.J., Middleton, P., Dowswell, T., & Morris, P.S. (2014). The effect of the timing of menstruation of the baby's umbilical cord on maternal and neonatal outcomes. *Evidence-Based Child Health*, 9(2), 303–397. <https://doi.org/10.1002/ebch.1971>
- McLean, E., Cogswell, M., Egli, I., Wojdyla, D., & De Benoist, B. (2009). Prevalence of anemia worldwide, WHO Vitamin and Mineral Nutrition Information System, 1993–2005. *Public Health Nutrition*, 12(4), 444–454. <https://doi.org/10.1017/S1368980008002401>
- Mercer, J.S., Erickson-Owens, D.A., Deoni, S.C., Dean, D.C., Collins, J., Parker, A.B., Wang, M., Joelson, S., Mercer, N.Y., & Padbury, J.F. (2018). Effects of Delayed Cord Clamping on 4-Month Ferritin Levels, Brain Myelin Content, and Nerve Development. *Journal of Pediatrics*, 203, 266–272.e2. <https://doi.org/10.1016/j.jpeds.2018.06.006>
- Mohammad, K., Tailakh, S., Fram, K., & Creedy, D. (2021). Effects of early umbilical cord clamping versus delayed clamping on maternal and neonatal outcomes: *Journal of Maternal-Fetal and Neonatal Medicine*, 34(2), 231–237. <https://doi.org/10.1080/14767058.2019.1602603>
- 03
- Ofojebe, C.J., Eleje, L.A., Ikechebelu, J.J., Okpala, B.C., Ofojebe, B.A., Ugwu, E.O., Igbojike, EP, Onwuegbuna, A.A., Ikwuka, DC, Anikwe, C.C., & Ejikeme, T.B. (2021). Randomized controlled clinical trials of peripartum effects of delayed versus direct cord clamping in full-term newborns. *European Journal of Obstetrics and Gynecology and Reproductive Biology*, 262, 99–104. <https://doi.org/10.1016/j.ejogrb.2021.04.038>
- Ohuma, E. O., Moller, A. B., Bradley, E., Chakwera, S., Hussain-Alkhateeb, L., Lewin, A., Okwaraji, Y. B., Mahanani, W. R., Johansson, E. W., Lavin, T., Fernandez, D. E., Domínguez, G. G., de Costa, A., Cresswell, J. A., Krasevec, J., Lawn, J. E., Blencowe, H., Requejo, J., & Moran, A. C. (2023). National, regional and global preterm birth estimates in 2020, with trends from 2010. *The Lancet*, 402(10409), 1261–1271. [https://doi.org/10.1016/S0140-6736\(23\)00878-4](https://doi.org/10.1016/S0140-6736(23)00878-4)
- World Health Organization. (2011). Guideline: Intermittent iron supplementation in preschool and school-age children. World Health Organization.
- World Health Organization. (2014). Guideline: Delayed umbilical cord clamping for improved maternal and infant health and nutrition outcomes. World Health Organization.
- K. C., A., Rana, N., Målqvist, M., Ranneberg, L. J., Subedi, K., & Andersson, O. (2017). Effects of delayed umbilical cord clamping vs early clamping on anemia in infants at 8 and 12 months. *JAMA Pediatrics*, 171(3), 264–270. <https://doi.org/10.1001/jamapediatrics.2016.3971>
- Pasricha, S.-R., Drakesmith, H., Black, J., Hipgrave, D., & Biggs, B.-A. (2013). Control of iron deficiency anemia in low- and middle-income countries. *Blood*, 121(14), 2607–2617. <https://doi.org/10.1182/blood-2012-09-453522>
- Perlman, J. M., Wyllie, J., Kattwinkel, J., Atkins, D.L., Chameides, L., Goldsmith, J.P., Guinsburg, R., Hazinski, M.F., Morley, C., Richmond, S., Simon, W. M., Singhal, N., Szyld, E., Tamura, M., & Velaphi, S. (2010). Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. *Circulation*, 122(16 SUPPL. 2), 516–539. <https://doi.org/10.1161/CIRCULATION.NAHA.110.971127>
- Raju, TNK, & Singhal, N. (2012). Optimal time to clamp the umbilical cord after birth. *Clinic in Perinatology*, 39(4), 889–900. <https://doi.org/10.1016/j.clp.2012.09.006>
- Stevens, G.A., Finucane, M.M., De-Regil, L.M., Paciorek, C. J., Flaxman, S.R., Branca, F., Peña-Rosas, J.P., Bhutta, Z.A., & Ezzati, M. (2013). Global, regional, and national trends in hemoglobin concentrations and prevalence of total and severe anemia in children and

- pregnant and non-pregnant women for 1995–2011: A systematic analysis of population-representative data. *Lancet Global Health*, 1(1), 16–25. [https://doi.org/10.1016/S2214-109X\(13\)70001-9](https://doi.org/10.1016/S2214-109X(13)70001-9)
- Sundararajan, S., & Rabe, H. (2021). Prevention of iron deficiency anemia in infants and toddlers. *Pediatric Research*, 89(1), 63–73. <https://doi.org/10.1038/s41390-020-0907-5>
- Manis, D.G., Carnielli, V., Greisen, G., Hallman, M., Ozek, E., Plavka, R., Saugstad, O.D., Simeoni, U., Speer, C.P., & Halliday, H.L. (2010). European consensus guidelines on the management of neonatal respiratory distress syndrome in premature infants - 2010 update. *Neonatology*, 97(4), 402–417. <https://doi.org/10.1159/000297773>
- de Pas, A.B., Knol, R., Lopriore, E., van den Akker, T.H., & Hooper, S.B. (2024). Physiological-based cord clamping. *Neonatology*, 547–552. <https://doi.org/10.1159/000540667>
- Raju, T. N. K. (2013). The new recommendations call for delaying umbilical cord clamping in premature babies. *AAP News*, 34(4), 17.
- Wood, S. (2023). Evidence to inform cord management in preterm birth. *The Lancet*, 402(10418), 2170–2171.
- World Health Organization, Department of Reproductive Health and Research. (2004). The WHO reproductive health library (Vol. 7)
- Yoon, S., Jin, Y., Kim, Y., Sung, J.H., Choi, S.J., Oh, S. Young, & Roh, C.R. (2023). Effects of delayed cord clamping on maternal and neonatal outcomes in twin pregnancies. *Scientific Reports*, 13(1), 1–9. <https://doi.org/10.1038/s41598-023-44575-9>

Adaptation of the caffrey cultural competence health services in nursing students in Lima, Peru

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Abstract

Background: In the Peruvian context, cultural sensitivity and awareness among healthcare professionals are essential due to the country's multicultural nature. To strengthen nursing education, reliable instruments are needed to assess perceived knowledge, self-awareness, and cultural competence.

Purpose: The aim of this study was to adapt the *Caffrey Cultural Competence* in Healthcare Scale for nursing students at a private university in Lima.

Methods: The sample consisted of 246 nursing students in the final academic terms. The adaptation process followed international guidelines for translation and back-translation, with expert committee review achieving 100% agreement on semantic and conceptual equivalence. Data were collected through an online survey and analyzed using descriptive statistics, confirmatory factor analysis, and internal reliability estimation with McDonald's Omega coefficient.

Results: Fit indices were optimal for both the five-factor model (Comparative Fit Index = .991; Tucker-Lewis Index = .990; Root Mean Square Error of Approximation = .021) and the unifactorial model (Comparative Fit Index = .992; Tucker-Lewis Index = .991; Root Mean Square Error of Approximation = .020), with evidence favoring the latter due to its greater parsimony. Reliability analysis showed excellent values for the total score and the Knowledge dimension, adequate values for Comfort/Proximity, moderate values for Comfort/Distance and Awareness, and lower consistency for the National Policies dimension.

Conclusion: The scale demonstrates structural validity and adequate reliability for its application among nursing students in Lima, representing a relevant contribution to the evaluation of cultural competence in diverse educational contexts.

Keywords: cultural competency; nursing students; psychometrics.

Introduction

In recent decades, nursing has been consolidated as a cross-disciplinary field within health systems, integrating knowledge and practices into a comprehensive model of care. The recent health crisis caused by the SARS-CoV-2 virus reinforced this role, placing nursing at the frontline of defense against the pandemic (da Silva et al., 2021).

Beyond technical foundations, nursing professionals require competencies that enable them to address individual and sociocultural variables that influence care. In this context, cultural competence allows for care adapted to the specific cultural characteristics and variations of individuals, respecting their customs and reducing sociocultural barriers that may affect the effectiveness of interventions, ensuring that procedures are adjusted to the patient rather than the patient to the procedure. Recent evidence confirms that the development of cultural competencies in nursing strengthens the therapeutic relationship and improves care quality (Martín et al., 2025), and that cultural factors such as community collaboration, family ties, and spiritual beliefs are determinants of intervention effectiveness and patient well-being in low- and middle-income countries (Cipta et al., 2024).

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At the international level, globalization and migration have prioritized cultural competence training in nursing. However, evidence published in Spanish-speaking countries remains limited, with greater development in Spain and scarce implementation in Latin America (El-Messoudi et al., 2023). A recent review identified systematic evaluation of undergraduate nursing students as a key strategy to improve cultural competence (Shopo et al., 2025).

In Peru, recent health policies have promoted the adaptation of health services under criteria of cultural relevance, aiming to ensure care that respects and adapts to the sociocultural diversity of the population (Ministerio de Salud del Perú (MINSA), 2024). Nevertheless, training in cultural competencies remains limited. A study conducted with healthcare professionals in rural service revealed that curricula do not foster the development of these competencies, creating difficulties in interacting within culturally diverse contexts (Agurto, 2022). These findings reinforce the need for valid instruments to evaluate and strengthen cultural competence from university training.

A recent systematic review identified 21 instruments to measure cultural competence in nursing, concluding that most present psychometric limitations and recommending not the development of new scales but the adaptation and strengthening of existing ones (Osmanovic et al., 2021). In this scenario, instruments with solid theoretical foundations and international validation are required to systematically assess cultural competence in nursing.

The Caffrey Cultural Competence in Healthcare Scale (CCCHS) was developed in 2005 to evaluate cultural competence in students and healthcare professionals, based on Wells' theoretical model (2000). This model conceives cultural competence as the result of two learning processes: the acquisition of knowledge -from ignorance to cultural awareness- and the change in attitude and behavior -from sensitivity to competence in multicultural settings- supporting the structure of the instrument and its applicability in nursing education.

Unlike other scales that focus on specific perceptions or cultural self-efficacy, the CCCHS offers a solid theoretical framework, a balanced structure, and evidence of sensitivity to change. Its relatively brief design facilitates application in academic settings, and its international validations demonstrate versatility and consistency. These characteristics make it a particularly useful tool for evaluating cultural competence in nursing students.

The importance of the CCCHS lies in its ability to systematically measure students' progression toward cultural competence, providing useful information to design educational strategies that integrate cultural sensitivity into curricula. Its incorporation into nursing classes facilitates the identification of areas for improvement and promotes training more aligned with the needs

of culturally diverse populations. Furthermore, recent studies have demonstrated the usefulness of the CCCHS in educational contexts, employing it to evaluate the impact of pedagogical strategies such as cultural simulation in nursing students. Findings confirm that the instrument can measure significant improvements in cultural competence after training interventions, reinforcing its relevance for integration into curricula (Kang et al., 2020; Kaur, 2025; McElfish et al., 2018). In this context, the aim of the present study was to adapt and validate the CCCHS in nursing students at a private university in Lima, in order to provide a reliable and relevant instrument to evaluate cultural competence in the Peruvian context.

Materials and Methods

Design

This is a quantitative, observational, cross-sectional, and instrumental study aimed at the cultural adaptation and psychometric validation of the Cultural Competence Health Services (CCCHS) scale in nursing students.

Sample and setting

The sample size was 246 students from a Faculty of Nursing of a private university in Lima in the last academic cycles between men ($n=9$, 3.659%) and women ($n=237$, 96.341%) and an age range of 21 to 29 years ($M=25.020$, $SD=2.607$, $U=858$, $p=.318$). In addition, 34.416% of the participants had less than 1 year of pre-professional experience related to their career ($n=84$) compared to 65.854% with 1 year or more ($n=162$). Along the same lines, in the category of "*Opportunity to meet patients from different cultures*", participants indicated "*often*" ($n=96$, 39.024%), "*never*" ($n=80$, 32.520%), and "*sometimes*" ($n=70$, 28.455%).

The selection of participants was carried out through non-probabilistic convenience sampling, considering that nursing students in the final academic terms have greater exposure to pre-professional practice and, therefore, increased potential contact with patients from diverse cultural backgrounds. The invitation to participate was managed through academic authorities, who distributed the online form via institutional platforms. Participation was voluntary, and confidentiality and informed consent were ensured prior to completing the questionnaire. This population was chosen because it represents the group closest to the transition into professional practice, where cultural competence is critical for the quality of healthcare delivery.

The selection criteria used are (a) regular enrollment in the last two academic semesters, (b) not being in the period of remedial courses, (c) 21 to 29 years old, (d) at least 1 month of experience in pre-professional practice, and (e) verbal and explicit agreement with the informed consent.

Variable

The main variable was cultural competence in health services, assessed through the CCCHS scale, which comprises five dimensions (knowledge, convenience/proximity, comfort/distal, awareness, and national conscience/policies). In addition, sociodemographic variables were collected to characterize the sample: age, sex, pre-professional experience, and opportunity for contact with patients from diverse cultures.

Instruments

The Caffrey Cultural Competence Health Services (CCCHS) was developed by Caffrey et al. (2005) to measure perceived knowledge, self-awareness, and fit with cultural competencies in healthcare settings. It is composed of 28 items with a five-point Likert response style where 1 reflects total disagreement and 5 represents total agreement. In relation to its structure, evidence of validity in a sample of nursing students identified that there are five dimensions: knowledge, comfort-proximal, comfort-distal, awareness, and awareness of national policy. Reliability indices by Cronbach's α ranged from .90 to .97.

Subsequently, Noji et al. (2017) analyzed the evidence of validity and reliability of the instrument in a nursing sample. Regarding validity, they identified that the five-factor model explains 62.31% of the variance through exploratory factor analysis (EFA). Then, they established the fit of the five dimensions by confirmatory factor analysis (CFA) and obtained acceptable indices (RMSEA=.058, 90% CI: .057 - .059, TLI=.891, CFI=.903, SRMR=.059). The internal consistency reliability ranged from .76 to .90, considered acceptable.

Intervention

The instrument was translated according to the guidelines developed by Ramada-Rodilla et al. (2013). This procedure is consistent with recent methodological recommendations on cross-cultural adaptation in health sciences (Cruchinho et al., 2024). In the first instance, the scale was translated from the original version into Spanish by two Peruvian bilingual translators and the synthesis version was agreed upon. In the second instance, the Spanish version was back-translated into English by two independently certified translators, and the English version was agreed upon in a meeting. In the third instance, the English version was compared with the original version by structuring a committee composed of a bilingual nurse and a methodologist fluent in both languages to evaluate the semantic equivalence between the versions, and the percentage of agreement equivalent to 100% was analyzed. In the last instance, the original version was analyzed, translated, and back-translated by all the professionals involved in all the phases to corroborate that the linguistic adaptation, grammatical construction, and vocabulary of the items are understandable for the target population.

Data collection

The virtual survey was used for the remote and automated collection of information in the sample selected for this study. The authorities of the institution were contacted to explain the rationale of the study highlighting the confidentiality, security, and benefits during the entire data collection process, and to request that the forms developed in Google be distributed in their virtual platforms. The data were collected in the period from October 2022 to February 2023.

Data analysis

The cases were transferred to a Microsoft Excel spreadsheet for quality control. The descriptive variables were analyzed by means of the mean (M), standard deviation (SD), coefficient of variation (CV), skewness (g_1), Kurtosis (g_2), and item-test correlation (r_{it}). Confirmatory factor analysis was performed using robust maximum likelihood estimation method (MLR) optimized for five response styles (Rhemtulla et al., 2012; Rogers, 2024). Model fit was estimated using the comparative fit index (CFI), Tucker-Lewis index (TLI), root mean squared error of approximation (RMSEA) with 95% confidence intervals and normalized root mean square (SRMR), and Akaike's index of criterion (AIC) to test four models: 5-factor oblique, 5-factor orthogonal, unidimensionality and direct hierarchical or bifactor, cut-off points of optimal adjusted to the following values were highlighted: CFI >0.95, TLI >0.95, RMSEA <.06, SRMR <.05 (Browne & Cudeck, 1992; Hu & Bentler, 1999). On the other hand, the lower the AIC index, the better the fit of the data to the proposed model. Reliability was analyzed for internal consistency by means of the Ω coefficient (Flora, 2020; Green & Yang, 2009).

The software used was Microsoft Excel and the R program, managed through the R studio user interface in addition to the function libraries "lavaan", "semTools", "psych", "mvn" and "ggplot2".

Ethical consideration

The ethical principles contained in the Declaration of Helsinki were followed throughout the study design process (Manzini, 2000) and the guidelines of the code of ethics of the Peruvian College of Nurses. In addition, in accordance with the nature of the administration of the instruments, the ethical guidelines for Internet-mediated research were considered (Dominguez-Lara & Torres-Villalobos, 2021).

Results

Table 1 showed that the coefficients of variation ranged from 23.7% to 38.4%, representing relative variability of the data with respect to their central tendency, the skewness and kurtosis values were in an acceptable range [-2; +2] and the relationship indexes were statistically significant and direct.

Table 2 showed that the 1-factor model (CFI=.992;

Table 1. Descriptive analysis of the CCCHS reagents

Reagents	M	SD	CV	g_1	g_2	r_{it}
Knowledge						
i2	3.736	1.361	0.364	-0.883	-0.496	.882
i3	3.748	1.341	0.358	-0.904	-0.404	.867
i4	3.736	1.287	0.345	-0.874	-0.364	.860
i5	3.740	1.363	0.365	-0.855	-0.579	.882
i6	3.382	1.294	0.383	-0.376	-0.852	.773
i7	3.707	1.292	0.348	-0.860	-0.403	.869
i15	3.768	1.235	0.328	-0.887	-0.217	.852
i16	3.740	1.28	0.342	-0.904	-0.265	.857
i17	3.772	1.238	0.328	-0.927	-0.102	.843
Convenience / Proximity						
i20	3.533	1.037	0.293	0.123	-1.173	.603
i21	3.508	1.013	0.289	0.108	-1.094	.625
i22	3.557	0.987	0.278	0.136	-1.061	.572
i23	3.610	1.039	0.288	0.023	-1.213	.662
i24	3.537	0.996	0.282	0.086	-1.061	.647
Comfort/Distal						
i1	2.675	0.948	0.354	-0.062	-0.968	.380
i8	2.699	0.934	0.346	-0.093	-0.928	.436
i9	2.638	0.975	0.369	-0.021	-1.040	.482
i10	2.691	0.909	0.338	-0.071	-0.860	.345
i13	2.756	0.963	0.350	-0.295	-0.874	.447
i14	2.764	0.918	0.332	-0.186	-0.857	.333
Awareness						
i11	2.744	0.954	0.348	-0.235	-0.897	.456
i12	2.772	0.929	0.335	-0.117	-0.984	.393
i18	2.715	1.042	0.384	-0.172	-1.188	.413
i19	2.707	0.950	0.351	-0.220	-0.872	.379
National Conscience/Policies						
i25	3.748	0.927	0.247	-0.129	-0.929	.285
i26	3.667	0.868	0.237	-0.052	-0.719	.277
i27	3.793	0.978	0.258	-0.286	-0.962	.339
i28	3.732	0.961	0.258	-0.163	-0.981	.312

Source: Own elaboration

Table 2. Fit indices of the proposed CCCHS models

Models	χ^2	SRMR	IFC	TLI	RMSEA	IC 95%		AIC
						LI	LS	
Oblique - 5 factors	378.473	.033	0.991	0.990	0.021	.000	.033	16330.193
Orthogonal - 5 factors	1432.859	.365	0.740	0.719	0.112	.106	.118	17355.222
1 factor	382.931	.033	0.992	0.991	0.020	.000	.031	16315.616
Bifactor	343.251	.031	0.995	0.994	0.016	.000	.030	16330.522

Table 3. Internal consistency reliability analysis of the CCCHS scores

Dimensions	Ω	95% CI	
		LI	LS
Knowledge	.966	.960	.972
Convenience/Proximity	.827	.793	.861
Comfort/Distal	.679	.617	.741
Awareness	.632	.557	.707
National Conscience/Policies	.516	.417	.615
Total	.964	.957	.970

TLI=.991; RMSEA=.020) and five correlated factors (CFI=.991; TLI=.990; RMSEA=.021) had optimal fit indices with evidence in favor of the unifactorial model (AIC=16315.616).

Figure 1 identified the factor structure of the five-factor oblique model whose factor loadings for each dimension were acceptable ($\lambda > .30$). In the knowledge dimension its values ranged from .786 to .902; in conformity/proximal they were .665 to .714; conformity/distinct was .474 to .554; awareness ranged from .453 to .635; and awareness of national policies, .324 to .475. Covariances between the latent variables were also observed.

In Table 3, it was identified that the dimensions “knowledge” and “comfort/proximity” obtained “optimal” reliability indexes. On the other hand, the dimensions “comfort/distal”, “awareness” and “awareness/national policies” had “acceptable” indices ($.50 < \Omega < .70$).

Discussion

Cultural and Linguistic Adaptation

This study followed the guidelines of Ramada-Rodilla et al. (2013) for the cultural adaptation of the CCCHS, consistent with internationally recognized recommendations for cross-cultural adaptation (Beaton et al., 2000; Guillemin et al., 1993). These protocols include, in addition to direct translation, synthesis, back-translation, and expert committee review, a pre-test phase with end users. Although the pre-test phase was not conducted in the present study -a methodological limitation, since it allows for evaluating item performance and detecting potential comprehension difficulties- the consensus among judges was 100%, ensuring semantic and conceptual equivalence of the items. Subsequent psychometric validation provided evidence of the instrument's structure and reliability in the studied population. Beyond this limitation, it is important to note that the cultural adaptation framework implemented in this research remains valid and has been applied in recent nursing studies (Graeff et al., 2022; Jalali et al., 2024). In conclusion, this study was conducted in accordance with established guidelines for cultural adaptation, ensuring semantic and conceptual equivalence of the items, and providing a reliable framework for application among nursing students in culturally diverse contexts.

Evidence of Structural Variability

Although the Caffrey Cultural Competence in Healthcare Scale (CCCHS) has been used in various studies as a reference instrument, only two investigations directly evaluated its psychometric properties: Noji et al. (2017) in Japan and Sattler et al. (2018) in the United States. These works therefore represent the most relevant and recent points of comparison for contrasting the findings of the present study. Results showed optimal fit indices for both the unifactorial model and the correlated five-factor model, with evidence favoring the former due to its greater parsimony. These findings coincide with those reported by Sattler, who identified a unifactorial model among health professions students, and differ from Noji, who primarily confirmed the five-factor structure.

Sample characteristics help explain this variability. Noji worked with more than 7,000 practicing nurses with extensive experience caring for foreign patients, which favored differentiation into five factors. In contrast, Sattler included 105 students from various health professions in international immersion programs and found a unifactorial model. This study, with 246 nursing students in Lima and heterogeneous levels of pre-professional experience and cultural exposure, also favored the parsimony of the unifactorial solution, suggesting that in training contexts cultural competence may be perceived as a global construct (Goretzko et al., 2021; Nájera et al., 2025).

In the present study, different models (unidimensional, orthogonal, oblique, hierarchical, and bifactor) were systematically contrasted without forcing statistical modifications. This strategy allowed for a broader evaluation of parsimony and interpretability, showing consistent evidence in favor of the unifactorial model in the Latin American context. However, interpretation of unidimensionality should be made with caution, as it was not possible to precisely determine the proportion of variance attributable to the general factor versus specific dimensions. Although the bifactor model did not yield interpretable solutions, this finding itself constitutes relevant evidence, consistent with literature on its limitations (Reise, 2012; Rodriguez et al., 2016). More recently, Gegenfurtner (2022) showed that its performance is particularly sensitive to sample size, number of items, and factorial complexity.

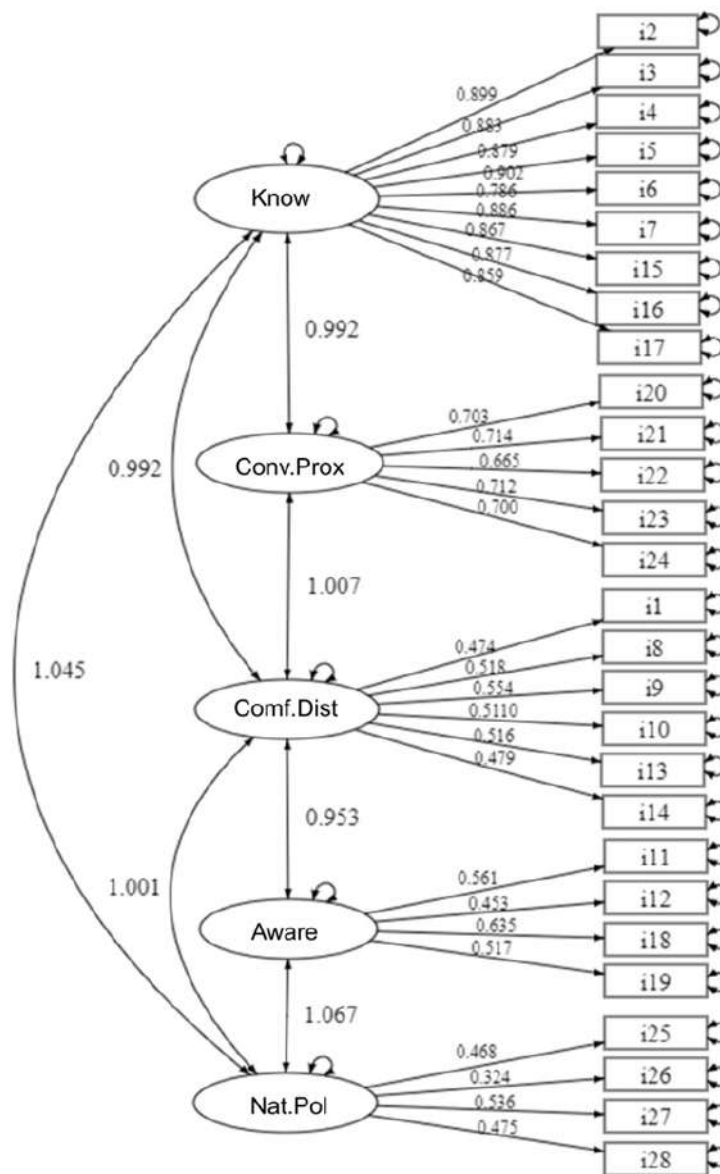


Figure 1. Five-dimensional structural model of the CCCHS

Taken together, these results reinforce the need to validate the CCCHS in different cultural contexts, as dimensionality may vary according to population characteristics and training environments.

Evidence of Reliability

Internal consistency analysis using McDonald's Omega coefficient showed excellent reliability for the total CCCHS score ($\Omega = .964$, 95% CI .957–.970) and for the Knowledge dimension ($\Omega = .966$, 95% CI .960–.972). The Comfort/Proximity

dimension reached adequate values ($\Omega = .827$, 95% CI .793–.861), while Comfort/Distance ($\Omega = .679$, 95% CI .617–.741) and Awareness ($\Omega = .632$, 95% CI .557–.707) presented moderate reliability. The Awareness/National Policies dimension obtained the lowest value ($\Omega = .516$, 95% CI .417–.615), confirming its relative fragility in the instrument's structure.

Reliability results are consistent with those reported in previous studies. Noji et al. (2017) found a global Cronbach's Alpha of .94 among nurses, with

adequate values in most dimensions, though with lower consistency in national policy items. Similarly, Sattler et al. (2018) reported a global Alpha of .94 among health professions students, confirming the instrument's high reliability in training contexts. In the present study, the Omega coefficient replicated the global consistency observed in both works, but also highlighted the relative fragility of the national policies dimension.

This pattern of high global reliability and lower consistency in specific dimensions coincides with literature on the measurement of complex constructs in cross-cultural contexts (Fischer et al., 2025; Kusano et al., 2025). Overall, the findings suggest that the CCCHS is a reliable instrument for evaluating cultural competence in nursing students, although certain dimensions require critical review in future adaptations.

This study presents some limitations that should be considered when interpreting the results. First, the pre-test phase with end users was not conducted, which would have allowed identification of potential comprehension difficulties in the practical application of items. Likewise, sample size constitutes a limitation for inferring the factorial structure with greater precision, and the absence of detailed stratification of analysis groups restricts generalization of findings. Finally, the lower consistency observed in the National Policies dimension suggests the need for critical review of this subscale in future cross-cultural adaptations.

Future studies are encouraged to use sampling calculation procedures based on structural equation modeling and to implement measurement invariance to determine score equivalence across subgroups and corroborate the instrument's metric properties among nursing professionals. In addition, it would be pertinent to evaluate temporal stability of scores through test-retest reliability and to replicate validation in other Latin American contexts, in order to confirm dimensionality and strengthen the applicability of the CCCHS in diverse educational and clinical settings.

Conclusion

The Caffrey Cultural Competence in Healthcare Scale (CCCHS) demonstrated adequate validity and reliability indices among nursing students at a private university in Lima, confirming its relevance for evaluating cultural competence in the Peruvian context. The results support both the unidimensional interpretation -as a global measure of cultural competence- and the five-factor structure, providing flexibility for its application in research and teaching.

This study represents a pioneering contribution in Latin America by offering novel evidence on the adaptation and validation of the CCCHS in a Spanish-speaking country. The availability of a reliable and culturally relevant instrument opens the possibility of strengthening university training in cultural competence and promoting comparative

research in the region.

In the educational field, the CCCHS can be integrated into the periodic evaluation of nursing students, allowing for the identification of areas for improvement in cultural training and guiding curricula toward less developed dimensions. In the clinical field, its application would contribute to identifying training needs among healthcare professionals working in culturally diverse contexts, enhancing the relevance of interventions and the quality of care.

Declaration of Interest

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

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Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

References

- Agurto, P. C. (2022). Intercultural competences of the professional serum health. *Anales de La Facultad de Medicina*, 83(1), 54–61. <https://doi.org/10.15381/anales>
- Álvarez San Martín, R., Catalán Obando, S. S., Morales Aldea, M. S., & Wolfgang Schifferli Montre, H. R. (2025). Cultural competencies in the management of care for culturally diverse patients: A scoping review. *Revista Uruguaya de Enfermería*, 20(1), e402. <https://doi.org/10.33517/rue2025v20n1a4>
- Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*, 25(24), 3186–3191. <https://doi.org/10.1097/00007632-200012150-00014>
- Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods & Research*, 21(2), 230–258. <https://doi.org/10.1177/0049124192021002005>
- Caffrey, R. A., Neander, W., Markle, D., & Stewart, B. (2005). Improving the cultural competence of nursing students: Results of integrating cultural content in the curriculum and an international immersion experience. *The Journal of Nursing Education*, 44(5), 234–240. <https://doi.org/10.3928/01484834-20050501-06>
- Cipta, D. A., Andoko, D., Theja, A., Utama, A. V. E., Hendrik, H., William, D. G., Reina, N., Handoko, M. T., & Lumbuun, N. (2024). Culturally

- sensitive patient-centered healthcare: A focus on health behavior modification in low and middle-income nations—insights from Indonesia. *Frontiers in Medicine*, 11, 1–7. <https://doi.org/10.3389/fmed.2024.1353037>
- Cruchinho, P., López-Franco, M. D., Capelas, M. L., Almeida, S., Bennett, P. M., da Silva, M. M., Teixeira, G., Nunes, E., Lucas, P., & Gaspar, F. (2024). Translation, cross-cultural adaptation, and validation of measurement instruments: A practical guideline for novice researchers. *Journal of Multidisciplinary Healthcare*, 17, 2701–2728. <https://doi.org/10.2147/JMDH.S419714>
- da Silva, T. C. L., Fernandes, Á. K. D. M. P., do O', C. B., Xavier, S. S. D. M., & de Macedo, E. A. B. (2021). The impact of the pandemic on the role of nursing: A narrative review of the literatura. *Enfermeria Global*, 63, 530–543. <https://doi.org/10.6018/eglobal.454061>
- Dominguez-Lara, S., & Torres-Villalobos, G. (2021). Ethical issues of the internet-mediated research: A reminder. *Educación Médica*, 22(3), 231–232. <https://doi.org/10.1016/j.edumed.2020.06.011>
- El-Messoudi, Y., Lillo-Crespo, M., & Leyva-Moral, J. (2023). Exploring the education in cultural competence and transcultural care in Spanish for nurses and future nurses: A scoping review and gap analysis. *BMC Nursing*, 22(1), 320. <https://doi.org/10.1186/s12912-023-01483-7>
- Fischer, R., Karl, J. A., Luczak-Roesch, M., & Hartle, L. (2025). Why we need to rethink measurement invariance: The role of measurement invariance for cross-cultural research. *Cross-Cultural Research*, 59(2), 147–179. <https://doi.org/10.1177/10693971241312459>
- Flora, D. B. (2020). Your coefficient alpha is probably wrong, but which coefficient omega is right? A tutorial on using r to obtain better reliability estimates. *Advances in Methods and Practices in Psychological Science*, 3(4), 484–501. <https://doi.org/10.1177/2515245920951747>
- Gegenfurtner, A. (2022). Bifactor exploratory structural equation modeling: A meta-analytic review of model fit. *Frontiers in Psychology*, 13, 1037111. <https://doi.org/10.3389/fpsyg.2022.1037111>
- Goretzko, D., Pham, T. T. H., & Bühner, M. (2021). Exploratory factor analysis: Current use, methodological developments and recommendations for good practice. *Current Psychology*, 40, 3510–3521. <https://doi.org/10.1007/s12144-019-00300-2>
- Graeff, M. D. S., Almeida, M. de A., Porcel-Gálvez, A. M., Nomura, A. T. G., Lunelli, R. P., & da Silva, T. S. (2022). Cross-cultural adaptation and validation of instrument to measure nursing care dependency. *Revista Gaucha de Enfermagem*, 43. <https://doi.org/10.1590/1983-1447.2022.20210135.en>
- Green, S. B., & Yang, Y. (2009). Reliability of summed item scores using structural equation modeling: An alternative to coefficient alpha. *Psychometrika*, 74(1), 155–167. <https://doi.org/10.1007/s11336-008-9099-3>
- Guillemin, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal of Clinical Epidemiology*, 46(12), 1417–1432. [https://doi.org/10.1016/0895-4356\(93\)90142-n](https://doi.org/10.1016/0895-4356(93)90142-n)
- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Jalali, A., Sharifi, A., Ezzati, E., Babaei, K., Chavoshani, F., Rahmani, S., & Moradi, khalil. (2024). Cultural adaptation and psychometric evaluation of the Persian version of the motivation for nursing student scale (MNSS). *BMC Medical Education*, 24(1). <https://doi.org/10.1186/s12909-024-06101-x>
- Kang, J., Song, J., & Noh, W. (2020). A systematic review and meta-analysis of the effects of global health competency improvement programs on nurses and nursing students. *Journal of Advanced Nursing*, 76(7), 1552–1566. <https://doi.org/10.1111/jan.14355>
- Kaur, N. (2025). Comparison of two teaching strategies in simulation on cultural humility and cultural competence among baccalaureate nursing students [Doctoral thesis, Columbia University]. <https://doi.org/10.7916/x1dt-g252>
- Kusano, K., Napier, J. L., & Jost, J. T. (2025). The mismeasure of culture: Why measurement invariance is rarely appropriate for comparative research in psychology. *Personality and Social Psychology Bulletin*. <https://doi.org/10.1177/01461672251341402>
- Manzini, J. L. (2000). Declaración de Helsinki: principios éticos para la investigación médica sobre sujetos humanos. Análisis de la 5a Reforma, aprobada por la Asamblea General de la Asociación Médica Mundial en octubre del año 2000, en Edimburgo. *Acta Bioethica*, 6(2). <http://dx.doi.org/10.4067/S1726-569X2000000200010>
- McElfish, P. A., Moore, R., Buron, B., Hudson, J., Long, C. R., Purvis, R., Schulz, T. K., Rowland, B., & Warmack, T. S. (2018). Integrating interprofessional education and cultural competency training to address health disparities, teaching and learning in medicine. *Teaching and Learning in Medicine*, 30(2), 213–222. <https://doi.org/10.1080/10401334.2017.1365717>
- Ministerio de Salud del Perú (MINSA). (2024, December 13). ¿Qué son los establecimientos de salud con pertinencia cultural? <https://www.gob.pe/69795-que-son-los-establecimientos-de-salud-con-pertinencia-cultural>
- Nájera, P., Abad, F. J., & Sorrel, M. A. (2025).

- Is exploratory factor analysis always to be preferred? A systematic comparison of factor analytic techniques throughout the confirmatory–exploratory continuum. *Psychological Methods*, 30(1), 16–39. <https://doi.org/10.1037/met0000579>
- Noji, A., Mochizuki, Y., Nosaki, A., Glaser, D., Gonzales, L., Mizobe, A., & Kanda, K. (2017). Evaluating cultural competence among Japanese clinical nurses: Analyses of a translated scale. *International Journal of Nursing Practice*, 23, e12551. <https://doi.org/10.1111/ijn.12551>
- Osmancevic, S., Schoberer, D., Lohrmann, C., & Großschädl, F. (2021). Psychometric properties of instruments used to measure the cultural competence of nurses: A systematic review. *International Journal of Nursing Studies*, 113. <https://doi.org/10.1016/j.ijnurstu.2020.103789>
- Dominguez-Lara, S. A. (2016). Sobre el uso del coeficiente alfa: comentarios a Ramada-Rodilla, Serra-Pujadas, y Delclós-Clanchet (2013). *Salud Pública De México*, 58(6), 596–597. <https://doi.org/10.21149/spm.v58i6.7676>
- Reise, S. P. (2012). The rediscovery of bifactor measurement models. *Multivariate Behavioral Research*, 47(5), 667–696. <https://doi.org/10.1080/00273171.2012.715555>
- Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological Methods*, 17(3), 354–373. <https://doi.org/10.1037/a0029315>
- Rodriguez, A., Reise, S. P., & Haviland, M. G. (2016). Evaluating bifactor models: Calculating and interpreting statistical indices. *Psychological Methods*, 21(2), 137–150. <https://doi.org/10.1037/met0000045>
- Rogers, P. (2024). Best practices for your confirmatory factor analysis: A JASP and lavaan tutorial. *Behavior Research Methods*, 56(7), 6634–6654. <https://doi.org/10.3758/s13428-024-02375-7>
- Sattler, T., Maddern, W., Toft, C., Torii, A., Hammarstrand, L., Stenborg, E., ... & Pajdla, T. (2018). Benchmarking 6dof outdoor visual localization in changing conditions. In Proceedings of the IEEE conference on computer vision and pattern recognition (pp. 8601–8610).
- Shopo, K. D., Nuuyoma, V., & Chihururu, L. (2025). Enhancing cultural competence in undergraduate nursing students: An integrative literature review of strategies for institutions of higher education. *Journal of Transcultural Nursing*, 36(4), 412–428. <https://doi.org/10.1177/10436596241301407>
- Wells, M. I. (2000). Beyond cultural competence: A model for individual and institutional cultural development. *Journal of Community Health Nursing*, 17(4), 189–199. https://doi.org/10.1207/S15327655JCHN1704_1

Students' characteristic contribution on personal boundaries in preventing the risk of sexual violence in faith-based boarding schools

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Abstract

Background: Personal boundaries are important for establishing students' identity and defense mechanisms. Strong boundaries help students to recognize limits for interaction, while weak boundaries increase vulnerability for manipulation and sexual violence. In faith-based boarding schools where interactions are intensive, personal boundaries are crucial for preventing harassment.

Purpose: This study examines students' personal boundaries and the determining factors.

Methods: A quantitative cross-sectional design applied to 532 respondents recruited through proportionate random sampling from three Faith-Based Boarding Schools (secondary schools) in West Java. Data were collected using a set of questionnaires and were analyzed using the Chi-Square test and logistic regression.

Results: More than half respondent (52%) reported weak personal boundaries and among the identified characteristics only students' age (older) and gender (male) that identified significantly associated with strong personal boundaries (p -value < 0.05). Logistic regression identifies age as the most dominant factor, with each one-unit increase in age increasing the likelihood of personal boundaries by approximately 2.380 times.

Conclusion: More than half students have weak personal boundaries. Older and male students tend to have stronger boundaries. There is a critical need for greater awareness and education on personal rights and boundary-setting within these environments, particularly for new (younger) and female students.

Keywords: faith-based boarding school; perception; personal boundaries; risk of sexual violence

Introduction

Personal boundaries are essential for maintaining mental, emotional, and social well-being. Clear boundaries help individuals distinguish their responsibilities, rights, and obligations from those of others. Without well-defined boundaries, individuals may experience stress, role confusion, and potential conflicts. Conceptually, boundaries regulate the interface between the self and others, shaping how individuals negotiate closeness, distance, responsibility, and identity within interpersonal and social systems. A comprehensive theoretical overview of personal boundaries requires integrating perspectives from psychodynamic theory, attachment theory, family systems theory, humanistic psychology, and contemporary relational and trauma-informed frameworks. Strong personal boundaries make

it easier for individuals to regulate physical and psychological interactions with others. Conversely, weak personal boundaries increase vulnerability to manipulation, abuse, and various forms of violence, including sexual violence (Schaeffer, 2018). In Faith-based Boarding Schools, where close-knit interactions are common, personal boundaries are crucial for preventing harassment. Understanding personal rights, body autonomy, and freedom of expression can help students establish clear boundaries in their interactions (Umar, 2020).

Faith-Based Boarding Schools are often regarded as safe and protected educational institutions. However, research indicates that closed environments, such as dormitories, may pose risks of sexual violence (Zayadi, 2020). The high level of daily interaction between students, teachers, and religious leaders can lead to power imbalances. Weak personal boundaries, coupled with misconceptions about sexual violence, may increase students' vulnerability to such violence (Davis & Farell, 2019). This study examines how individual characteristics such as age, gender, education level, and cultural background affect the establishment of these boundaries in such a close-knit setting. Personal boundaries determine how individuals express themselves, set limits, maintain privacy, and regulate emotional and physical interactions (Petronio, 2002).

With increasing age, individuals gain more experience (e.g., work experience, interpersonal relationships, and life challenges). This enhanced experience strengthens self-awareness, allowing individuals to better determine when to enforce boundaries and when to be more open (Bigelow & Caskie, 2025; Diehl et al., 2021).

Another study shows that women tend to be more expressive in interpersonal relationships and more skilled in communication (Hall, 2006). In some cases, these advanced communication skills make it easier for women to negotiate their boundaries verbally. However, due to societal expectations of women as "nurturers," some may struggle to assert their need for personal space and may experience ambivalence between their own needs and the demands of empathy (Vogel et al., 2003).

Higher education typically increases an individual's exposure to psychological knowledge, legal rights, and social norms regarding personal boundaries, mental health, and personal rights (Riggio et al., 1991). Advanced education also enhances analytical and reflective skills, enabling individuals to evaluate and manage boundaries more effectively (Li et al., 2024).

Individuals from collectivist cultures (e.g., many Asian countries) generally prioritize group harmony and shared interests. As a result, personal boundaries in these cultures tend to be more flexible, as solidarity and togetherness are core values (Markus & Kitayama, 1991). In societies with strong hierarchical values (e.g., where there are significant differences between younger and older

individuals or between superiors and subordinates), people may feel less free to set personal boundaries when interacting with those perceived to have higher status (Hofstede, 1991). Additionally, cultural norms regarding politeness may limit self-expression or outright rejection, requiring individuals to adjust how they enforce personal boundaries to align with local etiquette.

Material and Methods

Design

This study employs a quantitative, cross-sectional design to examine students' personal boundaries and further identify the contribution of students' characteristics (age, gender, education, and region) as determinants.

Sample and setting

The sample comprised 532 respondents recruited through proportional random sampling from the total population of 2,660 students across three faith-based boarding schools in West Java. That sample size was determined using the Slovin formula with a margin of error of 0.038. Inclusion criteria included students enrolled for at least 1 year and who had provided informed consent.

Variables

This study examines two main variables: students' personal boundaries over a specific period as the dependent variable, and students' characteristics (age, gender, education, and region of origin) as the independent variables.

Instruments

The Personal Boundaries Questionnaire, adapted from (Cloud & Townsend, 2017), consisted of 10 questions measuring physical, emotional, and social boundaries on a 1-5 Likert scale. Demographic data included age, gender, educational level, and region. Instruments were tested for validity and reliability, yielding satisfactory results (item correlations > 0.30 and Cronbach's alpha > 0.70).

Data collection

Data collection was conducted directly at each faith-based boarding school after first obtaining ethical approval from the Ethics Committee of Universitas Padjadjaran and permission from the schools. Before collecting the data, the researcher explained the study's purpose and objectives. After prospective participants understood the aims of the research and their rights as participants, the researcher asked for their willingness to take part in the study and to sign the informed consent form. For those who agree and sign the informed consent, a set of questionnaires is provided for completion and return to the researcher. All returned questionnaires are rechecked and asked to be completed if any incomplete answers are found.

Data analysis

Data were analysed using Statistical Package for the Social Sciences (SPSS) version 21 (Field, 2018). Descriptive statistics, including frequency distributions and percentages, were used to summarize the sample's characteristics. The chi-square test was used to examine differences in characteristics and personal boundaries, while odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to measure associations. A p-value of less than 0.05 was considered statistically significant. Multivariate logistic regression was performed to identify the most significant predictors.

Ethical consideration

All respondents received an explanation of the research and data collection procedures, assurances of confidentiality, and confirmation that their participation was voluntary and free of coercion from any party. This study was approved by Universitas Padjadjaran Ethics Committee under code 221/UN6.KEP/EC/2024. Subsequently, the researcher completed all necessary pre-research procedures, including obtaining ethics committee approval, securing a research permit, and establishing collaborations with the relevant boarding schools and integrated service posts, ensuring participant protection, especially for those under 18 years of age.

Result

The majority of respondents were in their late teens (70.3%), female (58.1%), and one-third (34%) were from the Bandung region. Regarding personal boundaries, more than half of the students (52%) exhibited weak personal boundaries (Table 1).

About Age, statistical tests indicate a significant relationship with personal boundaries ($p=0.007$). Late teenagers group tend to have stronger boundaries (51.5%) than early teenagers (39.9%).

Late teenagers were 2.67 times more likely to exhibit stronger personal boundaries compared to early teenagers.

Regarding gender, it can be observed that there was a significant relationship ($p=0.05$) and noted that male respondents tend to have stronger personal boundaries compared to females. Male respondents were 1.73 times more likely to exhibit stronger personal boundaries compared to females. However, in terms of students' education level and region of origin, statistical tests did not indicate a significant relationship between both variables and students' personal boundaries ($p=0.169$ and $p=0.199$ respectively).

Among the students' characteristics tested, only the age variable had significant partial effect in the model ($p=0.007$). $Y = -0.32 + 0.67 (\text{Age}) - 0.405 (\text{Education}) + 0.132 (\text{Region}) - 0.304 (\text{Sex})$. The constant (-0.32) represents the logit value when all independent variables are equal to zero. Students' age ($B = 0.67$, $p = 0.007$) shows a statistically significant positive effect; means that each one-unit increase in student's age increases the odds of the dependent variable (students' personal boundaries) by approximately 2.380 times. In addition, student's sex ($B = -0.304$, $p = 0.05$) demonstrates a negative effect and lies exactly at the threshold of statistical significance ($p \leq 0.05$). While student's level of education and region of origin were not statistically significant ($p > 0.05$), indicating that their effects on the model were not robust for generalization.

Discussion

Boundary Theory posits that individuals with strong personal boundaries are better able to recognize and avoid potentially harmful situations (Clark, 2000). In other words, personal boundaries serve as psychological and social protection, including in situations that may lead to sexual violence. Personal boundaries function as psychological and social

Table 1. Characteristics of the respondents (n=532)

Variable	Category	n	%
Education	Junior high school	209	39.3
	Senior high school	323	60.7
Age	Early teenagers	158	29.7
	Late teenagers	374	70.3
Gender	Male	223	41.9
	Female	309	58.1
Region of Origin	Garut	145	27.3
	Bandung	181	34.0
	Tasikmalaya	97	18.2
	Others	109	20.5
Personal Boundaries	Weak	255	52.0
	Strong	276	48.0

Table 2. Association Between Students' Characteristics and Personal Boundaries

Variable	Personal Boundaries				p-Value	AOR
	Weak		Strong			
	n	%	n	%		
Education level						
Junior High School	114	54.8	94	45.2	0.169	1.2
Senior High School	162	50.2	161	49.8		
Age						
Early teenagers	95	60.1	63	39.9	0.007	2.67
Late teenagers	181	48.5	192	51.5		
Gender						
Male	107	48	116	52	0.05	1.73
Female	169	54.9	139	45.1		
Region						
Garut	78	54.2	66	45.8	0.199	
Bandung	96	53	85	47		
Tasikmalaya	55	56.7	42	43.3		
Others	47	43.1	62	56.9		
Total	276	52	255	48		

Table 3. Regression analysis

Variable	B	SE	Sig.	Exp(B)	95 % CI	
					Lower	Upper
Age	0.67	0.322	0.007	2.380	1.265	4.477
Level Education	-0.405	0.303	0.181	0.667	0.369	1.207
Region	0.132	0.083	0.109	1.141	0.971	1.342
Sex	-0.304	0.178	0.05	0.738	0.520	1.047
Constant	-0.32	0.499	0.142	0.481		

protection, enabling individuals to establish physical, emotional, and social limits in relationships and reduce vulnerability to manipulation, exploitation, or sexual violence (Herman, 2022; Reid, 2026; Ryder & Bartle, 2026). Core aspects of healthy boundaries include the ability to refuse unwanted interactions, recognize risk, and respond to early warning signs of aggressive or invasive behavior.

In this study, respondents with a Senior High School education level appeared to exhibit stronger personal boundaries than those with Junior High School education; however, the statistical analysis did not indicate a significant relationship. While higher education may provide greater exposure to psychological knowledge, legal awareness, and boundary-setting resources (Li et al., 2022), these effects were not statistically significant in this sample. Thus, interpretations regarding the role of education should remain cautious.

Previous research has shown that weak personal boundaries are often associated with limited awareness of personal rights and safety, increasing vulnerability to sexual violence (Gomez-Pulido et al., 2024; Schneider & Hirsch, 2018). These findings highlight the need for educational

programs that emphasize personal boundary development across all levels of schooling. Integrating assertive communication, recognition of abuse, and boundary-setting into curricula can empower individuals with self-protection strategies and enhance awareness of personal rights, thereby contributing to the prevention of sexual violence from an early age (Barter et al., 2015; Bonar et al., 2022; Casey et al., 2020; Katz et al., 2023; Lavoie-Tremblay et al., 2022; WHO & UN Women, 2020).

The study's findings indicate a significant relationship between age and personal boundaries, highlighting the developmental nature of boundary-setting. As individuals mature, psychological and cognitive growth enhances their understanding and enforcement of personal limits. Adolescents and young adults are often in the "identity exploration" phase, during which personal boundaries remain flexible and are continually shaped by experiences and self-discovery (Luyckx et al., 2025). In contrast, older individuals typically possess a more stable self-concept, enabling them to maintain clearer, more consistent boundaries (Klimstra & Denissen, 2017). Furthermore, life experiences, including professional challenges, interpersonal relationships,

and personal adversities, foster self-awareness, enabling individuals to recognize when to assert boundaries and when to adapt them (London et al., 2023).

Interestingly, the study found no significant relationship between geographic region and personal boundaries, a result that diverges from previous research. For instance, (Luong et al., 2020) suggest that individuals from collectivist cultural backgrounds may exhibit more flexible boundaries, potentially affecting vulnerability to sexual violence. This discrepancy underscores the complexity of boundary development, which is not solely determined by cultural context but also by immediate social environments. Family support, early education, and guidance on boundary-setting are crucial factors that reinforce individuals' ability to protect themselves from harm. These findings highlight the importance of active involvement by parents and educators in fostering boundary awareness, emphasizing its role as a preventive strategy against sexual violence (Moiseeva et al., 2020).

The findings of this study highlight a significant relationship between gender and personal boundaries, indicating that women are more likely to exhibit weaker personal boundaries, which can increase their vulnerability to sexual violence. While women generally demonstrate strong interpersonal communication skills and emotional expressiveness (Hall et al., 2016), these traits do not always translate into the effective assertion of personal boundaries. Social expectations that emphasize nurturing and empathetic behaviors may create internal conflicts, leading women to feel pressure to prioritize others' needs over their own personal space, thereby compromising their ability to set boundaries (Folberg et al., 2022).

Weak personal boundaries have been linked to increased susceptibility to privacy violations, manipulation, and exploitation. Research shows that individuals who struggle to establish or maintain clear boundaries are more likely to become victims of sexual violence (Linehan & Wilks, 2015). This underscores the importance of interventions designed to strengthen personal boundaries, particularly for vulnerable populations such as children, adolescents, and individuals experiencing mental health challenges. Comprehensive approaches including assertiveness training, sexuality education, and psychological counselling can enhance individuals' capacity to recognize, communicate, and maintain their boundaries in interpersonal relationships (Lindon & Webb, 2016).

Furthermore, persistent social norms that reinforce gender inequality exacerbate women's challenges in maintaining personal boundaries, further increasing their risk of victimization (Dixit, 2023). By promoting education, empowerment, and interpersonal skills development, women can be better equipped to navigate social pressures while protecting their personal space. Such strategies are

essential not only for individual safety but also for fostering a broader culture of respect and boundary awareness.

Personal boundaries are shaped by a complex interplay of psychological, social, and cultural factors. Early-life experiences, including parenting styles and childhood trauma, play a critical role in boundary development. Traumatic experiences such as abuse, neglect, or family instability can disrupt attachment processes, often leading to difficulties in establishing and maintaining boundaries later in life (Fulgieri, 2025; Quan et al., 2024). Individuals with a history of trauma may struggle with asserting boundaries due to fears of conflict, abandonment, or discomfort in interpersonal relationships. Complementing these early influences, self-esteem and self-concept are fundamental in boundary-setting. High self-esteem empowers individuals to express discomfort and decline unwanted interactions assertively, while a well-defined self-concept helps them recognize personal needs and limits. Conversely, individuals with low self-concept may be more susceptible to external pressures or hesitant to voice concerns (Wang et al., 2025; Yang et al., 2025).

Emotional intelligence further supports effective boundary management by enabling individuals to understand and regulate their own emotions while recognizing those of others (Chernata, 2024). Individuals with high emotional intelligence are better able to detect threats or discomfort and communicate their needs clearly (Franco et al., 2025). Cultural context also significantly impacts boundary-setting. In collectivist cultures, which prioritize group harmony, asserting personal boundaries may be perceived as selfish, creating barriers to boundary enforcement. In contrast, individualistic cultures encourage personal autonomy and validate the importance of maintaining clear boundaries (Jiao & Zhao, 2023; Klein et al., 2024).

Family dynamics and social environments further influence how boundaries are formed and maintained. Families that model open communication and mutual respect help children develop a strong sense of personal limits (Thasneem, 2025). Similarly, supportive peer networks reinforce boundary recognition, whereas environments that tolerate boundary violations, such as bullying, can weaken an individual's capacity to assert their limits (Hoffman et al., 2021). Finally, attachment style plays a critical role in shaping boundary behaviors. Securely attached individuals can maintain boundaries without guilt or fear of rejection, whereas those with anxious attachment may exhibit overly flexible boundaries, and those with avoidant attachment may engage in excessive boundary enforcement to avoid intimacy (Fraley et al., 2021; Sagone et al., 2023). Collectively, these findings underscore that personal boundaries are not static traits but dynamic skills influenced by multiple interrelated factors across the lifespan.

The findings of this study highlight the multifaceted

nature of personal boundaries, demonstrating how psychological and demographic factors interact to shape individuals' ability to establish and maintain them. Psychological maturity, characterized by the capacity for self-reflection, recognition of personal strengths and weaknesses, and responsibility for one's emotions and actions, plays a critical role in boundary-setting (Gardner et al., 2020). Individuals with higher self-awareness are more attuned to situations that necessitate asserting or negotiating boundaries, while assertive communication skills enable them to express needs and discomforts effectively without aggression or passivity (Hanks, 2016; Megele & Longfield, 2017). In contrast, maladaptive communication patterns, such as passive-aggressiveness or excessive aggression, can undermine the development of healthy personal boundaries (Hamilton et al., 2021).

Among the variables examined, age emerged as the strongest predictor of personal boundaries, with the highest coefficient (0.526) in the logistic regression analysis. This suggests that as individuals grow older, they are more likely to have clear, robust personal boundaries. With age comes accumulated social, emotional, and life experiences that enhance one's ability to set and maintain boundaries (Kuther, 2018). Emotional and psychological maturity further supports this process by facilitating stable emotional regulation and thoughtful negotiation of personal needs (Soto et al., 2016). Moreover, at different life stages, individuals tend to prioritize personal well-being and become selective in social relationships, further reinforcing boundary-setting behaviors (Lachman et al., 2015). These insights are particularly valuable for practitioners, educators, and counsellors, as they suggest that interventions to strengthen personal boundaries may need to be tailored according to developmental stages.

The study also identified that region of origin, whether urban or rural, has a modest effect on personal boundaries, highlighting the influence of cultural and environmental contexts (Crozet, 2022). This underscores the importance of context-specific approaches when designing programs or interventions to enhance boundary awareness and skills. Additionally, the negative coefficient for gender suggests that men and women differ in the likelihood of forming personal boundaries, with male respondents demonstrating stronger boundaries. These gender differences warrant further qualitative exploration to understand how social norms, patriarchal culture, and other biopsychosocial factors shape boundary-related behaviors.

Nursing implication

This study holds vital implications toward nursing practices and nursing research. Practically, the weak students' personal boundaries found this study indicated that any program to enhance students' personal boundaries are very important. Particularly, in the early stage/new students. Additionally, this study only covers some students'

characteristic potentially contribute to the personal boundaries. There are other factors such as personality traits, socioeconomic status, and past trauma may also play significant roles (Kamene, 2025). Future research should therefore incorporate these additional variables to develop a more comprehensive understanding of the complex interplay of determinants influencing personal boundaries.

Conclusion

There is a significant relationship between students' age and gender with the students' personal boundaries, where older students and male tend to have stronger personal boundaries. Students' age identified as the most contributing factors to the students' personal boundaries. Education level and region of origin do not significantly impact these boundaries. These findings emphasize the importance for the faith-based boarding school to develop strategies fostering strong students' personal boundaries, particularly for new (younger) and female students through tailoring educational programs to mitigate the risk of sexual violence in school.

Declaration of Interest

The authors declare no conflicts of interest.

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Data Availability

The datasets generated during and analyzed during the current study are available from the corresponding author upon reasonable request.

Reference

- Barter, C., Wood, M., Aghtaie, N., Larkins, C., & Stanley, N. (2015). Safeguarding teenage intimate relationships (STIR): Connecting online and offline contexts and risks (Research report). European Commission DAPHNE III Programme.
- Bigelow, A. R., & Caskie, G. I. L. (2025). Examining the structural relations of awareness of age-related change, inductive reasoning, and psychological well-being in older adults. *Aging and Mental Health*, 29(11), 2145–2153. <https://doi.org/10.1080/13607863.2025.2495285>
- Bonar, E. E., DeGue, S., Abbey, A., Coker, A. L.,

- Lindquist, C. H., McCauley, H. L., Miller, E., Senn, C. Y., Thompson, M. P., Ngo, Q. M., Cunningham, R. M., & Walton, M. A. (2022). Prevention of sexual violence among college students: Current challenges and future directions. *Journal of American College Health : J of ACH*, 70(2), 575–588. <https://doi.org/10.1080/07448481.2020.1757681>
- Casey, E., Lindhorst, T. P., Wiley-Sthapit, C., Casey, E., Lindhorst, T. P., & Wiley-Sthapit, C. (2020). Assessing the evidence: How systems that address intimate partner violence evaluate the credibility and utility of research findings. *Journal of Family Violence*, 36(3), 259–270. <https://doi.org/10.1007/s10896-020-00163-3>
- Chernata, T. (2024). Personal boundaries: Definition, role, and impact on mental health. *Personality and Environmental Issues*, 3(1), 24–30. [https://doi.org/10.31652/2786-6033-2024-3\(1\)-24-30](https://doi.org/10.31652/2786-6033-2024-3(1)-24-30)
- Clark, S. C. (2000). Work/family border theory: A new theory of work/family balance. *Human relations*, 53(6), 747–770. <https://doi.org/10.1177/0018726700536001>
- Cloud, H., & Townsend, J. (2017). Boundaries: When to say yes, how to say no to take control of your life. Zondervan.
- Crozet, C. (2022). Globalization and culture. *Global Encyclopedia of Public Administration, Public Policy, and Governance*, 5346–5353. https://doi.org/10.1007/978-3-030-66252-3_1319
- Davis, K., & Farrell, S. (2019). Understanding personal boundaries: A protective factor to safeguard adolescents from violence. *Journal of Adolescent Health*, 65(5), 786–794.
- Diehl, M., Brothers, A. F., & Wahl, H. W. (2021). Self-perceptions and awareness of aging: Past, present, and future. *Handbook of the Psychology of Aging*, 155–179. <https://doi.org/10.1016/B978-0-12-816094-7.00001-5>
- Dixit, S. (2023). Role of social norms and culture in gender violence. <https://doi.org/10.51244/IJRSI>
- Field, A. P. (2018). Discovering statistics using IBM SPSS statistics. 5th Edition. <https://www.scirp.org/reference/referencespapers?referenceid=3504991>
- Folberg, A. M., Zhu, M., He, Y., & Ryan, C. S. (2022). The primacy of nurturance and dominance/assertiveness: Unidimensional measures of the big two mask gender differences in subdimensions. *International Review of Social Psychology*, 35(1). <https://doi.org/10.5334/irsp.690>
- Fraley, R. C., Gillath, O., & Deboeck, P. R. (2021). Do life events lead to enduring changes in adult attachment styles? A naturalistic longitudinal investigation. *Journal of Personality and Social Psychology*, 120(6), 1567–1606. <https://doi.org/10.1037/pspi0000326>
- Franco, B., Bonn, M. A., Zhang, F., & Tahhan, S. A. (2025). Emotional intelligence and employees' commitment: Analyzing the role of brand image and corporate social responsibility among Lebanese SMEs. *Sustainability* 2025, Vol. 17, Page 9602, 17(21), 9602. <https://doi.org/10.3390/su17219602>
- Fulgieri, M. (2025). Healing relational trauma: Move beyond painful childhood experiences to deepen self-understanding and build authentic relationships. New Harbinger Publications.
- Gardner, M., Artzi, Y., Basmova, V., Berant, J., Bogin, B., Chen, S., Dasigi, P., Dua, D., Elazar, Y., Gottumukkala, A., Gupta, N., Hajishirzi, H., Ilharco, G., Khashabi, D., Lin, K., Liu, J., Liu, N. F., Mulcaire, P., Ning, Q., ... Zhou, B. (2020). Evaluating models' local decision boundaries via contrast sets. *Findings of the Association for Computational Linguistics Findings of ACL: EMNLP 2020*, 1307–1323. <https://doi.org/10.18653/v1/2020.findings-emnlp.117>
- Gomez-Pulido, E., Garrido-Macías, M., Miss-Ascencio, C., & Expósito, F. (2024). Under the shadows of gender violence: An exploration of sexual consent through spanish university women's experiences. *European Journal of Psychology Applied to Legal Context*, 16(2). <https://doi.org/10.5093/ejpalc2024a10>
- Hall, J. A. (2006). Women's and men's nonverbal communication: Similarities, differences, stereotypes, and origins. *The Social Psychology of Nonverbal Communication*, 1, 141–177. <https://doi.org/10.4135/9781412976152.n11>
- Hall, J. A., Gunnery, S. D., & Horgan, T. G. (2016). Gender differences in interpersonal accuracy. *The Social Psychology of Perceiving Others Accurately*, 309–327. <https://doi.org/10.1017/cbo9781316181959.015>
- Hamilton, L., and, L. B.-F. I. for T., & 2021, undefined. (2021). Boundaries and boundary setting in clinical practice. *Taylorfrancis.Com*, 67–89. <https://doi.org/10.4324/9780429262074-4>
- Hanks, J. D. A. (2016). The assertiveness guide for women: How to communicate your needs, set healthy boundaries, and transform your relationships. New Harbinger Publications.
- Herman, J. L. (2015). Trauma and recovery: The aftermath of violence--from domestic abuse to political terror (Updated ed.). Basic Books.
- Hoffman, M., Hanson, B., ... S. B.-J. of H., & 2021, undefined. (2021). Boundaries: A boundary setting and social competence program for parents and youth. *ERIC*, 9(3), 15. <https://doi.org/10.54718/JSX14975>
- Hofstede, G. (1991). Cultures and organizations: Software of the mind. McGraw-Hill.
- Jiao, J., & Zhao, J. (2023). Individualism, collectivism, and allocation behavior: Evidence from the ultimatum game and dictator game. *Behavioral Sciences*, 13(2), 169. <https://doi.org/10.3390/bs13020169>
- Kamene, K. (2025). Scars that shape us: The long-term impact of adverse childhood experiences on mental health. *Premierscience.Com*. <https://premierscience.com/wp-content/>

- [uploads/2025/07/pjp-25-902.pdf](#)
- Katz, D. J., Abdelhamid, A., Stark, H., Canagaratna, M. R., Worsnop, D. R., & Browne, E. C. (2023). Chemical identification of new particle formation and growth precursors through positive matrix factorization of ambient ion measurements. *Atmospheric Chemistry and Physics*, 23(9), 5567–5585. <https://doi.org/10.5194/acp-23-5567-2023>
- Klein, N. D., Bravo, A. J., Conway, C. C., Keough, M. T., Pilatti, A., Mezquita, L., Ruiz, P., Roozen, H. G., Read, J. P., Prince, M. A., Pilatti, A., Pearson, M. R., Ortet, G., Mezquita, L., Keough, M., Kaminer, D., Ibáñez, M. I., Hogarth, L., Henson, J. M., ... Bravo, A. J. (2024). Individualism, collectivism, and emotion regulation: A cross-cultural examination among young adults from seven countries. *Current Psychology*, 43(31), 26007–26018. <https://doi.org/10.1007/s12144-024-06226-8>
- Klimstra, T. A., & Denissen, J. J. A. (2017). A theoretical framework for the associations between identity and psychopathology. *Developmental Psychology*, 53(11), 2052–2065. <https://doi.org/10.1037/dev0000356>
- Kuther, T. L. (2018). *Lifespan development: Lives in context*. SAGE publications. ISBN-13: 978-1483368856 (2016 edition)
- Lachman, M. E., Teshale, S., & Agrigoroaei, S. (2015). Midlife as a pivotal period in the life course: Balancing growth and decline at the crossroads of youth and old age. *International Journal of Behavioral Development*, 39(1), 20–31. <https://doi.org/10.1177/0165025414533223>
- Lavoie-Tremblay, M., Sanzone, L., Aubé, T., & Paquet, M. (2022). Sources of stress and coping strategies among undergraduate nursing students across all years. *The Canadian Journal of Nursing Research = Revue Canadienne de Recherche En Sciences Infirmières*, 54(3), 261–271. <https://doi.org/10.1177/08445621211028076>
- Li, J. H., Guo, S. X., Ma, R. L., He, J., Zhang, X. H., Rui, D. S., Ding, Y. S., Li, Y., Jian, L. Y., Cheng, J., & Guo, H. (2024). Comparison of the effects of imputation methods for missing data in predictive modelling of cohort study datasets. *BMC Medical Research Methodology*, 24(1). <https://doi.org/10.1186/s12874-024-02173-x>
- Li, Y., Bao, C., & Liu, M. (2022). The integration of legal education and mental health education of college students in the contemporary network environment facing the cultivation of civic awareness. *Journal of Environmental and Public Health*, 2022. <https://doi.org/10.1155/2022/4858156>
- Lindon, Jennie., & Webb, Janet. (2016). *Safeguarding and child protection*. Hodder Education. <https://www.bookfusion.com/books/4337344-safeguarding-and-child-protection-5th-edition-linking-theory-and-practice>
- Linehan, M. M., & Wilks, C. R. (2015). The course and evolution of dialectical behavior therapy. *American Journal of Psychotherapy*, 69(2), 97–110. <https://doi.org/10.1176/appi.psychotherapy.2015.69.2.97>
- London, M., Sessa, V. I., & Shelley, L. A. (2023). Developing self-awareness: Learning processes for self- and interpersonal growth. *Annual Review of Organizational Psychology and Organizational Behavior*, 10(Volume 10, 2023), 261–288. <https://doi.org/10.1146/annurev-orgpsych-120920-044531>
- Luong, G., Arredondo, C. M., & Charles, S. T. (2020). Cultural differences in coping with interpersonal tensions lead to divergent shorter- and longer-term affective consequences. *Cognition & Emotion*, 34(7), 1499. <https://doi.org/10.1080/02699931.2020.1752153>
- Luyckx, K., Vanderhaegen, J., Raemen, L., & Claes, L. (2025). Identity formation in adolescence and emerging adulthood: A process-oriented and applied perspective. *European Journal of Developmental Psychology*, 22(2), 168–187. <https://doi.org/10.1080/17405629.2023.2250128>
- Markus, H., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98(2), 224–253. <https://doi.org/10.1037/0033-295X.98.2.224>
- Megele, C., & Longfield, A. (2017). Online identity, digital citizenship and boundaries. In *Safeguarding Children and Young People Online*. Bristol University Press. <https://doi.org/10.46692/9781447331834.004>
- Moiseeva, N., Gantseva, E., Lyamina, L., & Lyamina, L. (2020). The phenomenon of psychological boundaries. *European Proceedings of Social and Behavioural Sciences*, 93. <https://doi.org/10.15405/epsbs.2020.11.73>
- Petronio, S. (2002). *Boundaries of privacy: Dialectics of disclosure*. State University of New York Press.
- Quan, L., Zhang, K., & Chen, H. (2024). The relationship between childhood trauma and romantic relationship satisfaction: The role of attachment and social support. *Frontiers in Psychiatry*, 15, 1519699. <https://doi.org/10.3389/fpsy.2024.1519699>
- Reid, S. (2026). Setting healthy boundaries in relationships. HelpGuide.org. <https://www.helpguide.org/relationships/social-connection/setting-healthy-boundaries-in-relationships>
- Riggio, R. E., Tucker, J., & Coffaro, D. (1991). Social skills and empathy. *Personality and Individual Differences*, 11(8), 775–779. [https://doi.org/10.1016/0191-8869\(89\)90184-0](https://doi.org/10.1016/0191-8869(89)90184-0)
- Ryder, R. G., & Bartle, S. (1991). Boundaries as distance regulators in personal relationships. *Family Process*, 30(4), 393–406. <https://doi.org/10.1111/j.1545-5300.1991.00393.x>
- Sagone, E., Commodari, E., Indiana, M. L., & La Rosa, V. L. (2023). Exploring the association

- between attachment style, psychological well-being, and relationship status in young adults and adults-a cross-sectional study. *European Journal of Investigation in Health, Psychology and Education*, 13(3), 525–539. <https://doi.org/10.3390/ejihpe13030040>
- Schaeffer, M. (2018). Personal boundaries and adolescent psychosocial development. *Child and Youth Care Forum*, 47(3), 391–406. <https://doi.org/10.1007/s10566-017-9427-6>
- Schneider, M., & Hirsch, J. S. (2018). Comprehensive sexuality education as a primary prevention strategy for sexual violence perpetration. *Trauma, Violence & Abuse*, 21(3), 439. <https://doi.org/10.1177/1524838018772855>
- Soto, C. J., & Tackett, J. L. (2015). Personality traits in childhood and adolescence: Structure, development, and outcomes. *Current Directions in Psychological Science*, 24(5), 358–362. <https://doi.org/10.1177/0963721415589345>
- Thasneem, F. (2025). Exploring the relationship of family communication patterns with assertiveness and academic resilience among college students.
- Umar, H. (2020). The importance of personal boundaries for students at Islamic boarding schools. *Jurnal Psikologi Islam*, 3(1), 55–68.
- Vogel, D. L., Wester, S. R., Heesacker, M., & Madon, S. (2003). Confirming gender stereotypes: A social role perspective. *Sex Roles*, 48(11–12), 519–528. <https://doi.org/10.1023/A:1023575212526>
- Wang, G., Li, X., & Hu, Y. (2025). How does social support promote professional identity among university students? A moderated mediation model of self-esteem and self-efficacy. *Humanities and Social Sciences Communications* 2025 12:1, 12(1), 872-. <https://doi.org/10.1057/s41599-025-04857-1>
- WHO, & UN Women. (2020). Respect women: Preventing violence against women – Implementation package | Digital library: Publications | UN Women – Headquarters. <https://www.unwomen.org/en/digital-library/publications/2020/07/respect-women-implementation-package>
- Yang, Y., Wang, H., Gong, S., & Qiu, Y. (2025). The relationship between self-concept clarity and meaning in life among adolescents: Based on variable-centered perspective and person-centered perspective. *Behavioral Sciences* 2025, 15(7), 948. <https://doi.org/10.3390/bs15070948>
- Zayadi. (2020). Power hierarchy in Islamic boarding schools: Finding a safe space for students. *Jurnal Pendidikan Islam*, 36(2), 201–219.

Severity of self-reported outcomes in patients with cancer in West Java Province, Indonesia

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Abstract

Background: Assessing cancer-related patient-reported outcomes is rare in Indonesia. A prior study identified the need for cancer management at the clinic level to overcome low screening, late diagnosis, late treatment, and awareness of cancer.

Purpose: This study aimed to describe cancer patients' self-reports of the severity of symptoms and how it correlates to their characteristics in West Java Province, Indonesia.

Methods: A cross-sectional survey of patients with cancer was conducted. As many as 227 patients (response rate 90.8%) were recruited from RSHS Hospital and nearby shelters using purposive sampling technique. Data were collected via respondent's characteristics questionnaire and the Integrated Palliative Care Outcomes Scale. Data were analysed using bivariate and multivariate chi square tests.

Results: A total of 227 questionnaires were received and analysed (response rate 90.8%). The participants were Sundanese (84%), married (81.5%), 36–55 years old (63.9%), housewives (51.5%), and had primary-level education (57.5%). These patients had been diagnosed between 6 and 12 months (35.7%), with a mean of 1.69 years (SD 2.7), and most patients were without comorbidities (85%). The mean distance to the hospital was 149.3 km (SD=271.7). The most prominent physical symptom experienced was pain (72.2%), while the most prominent emotional concern was family anxiety (45.4%). More than 50% of participants reported severe symptoms. Further statistics show that there is a correlation between performance and pain scale level with severity of patient-reported outcomes (p-value 0,001; α 0,05).

Conclusion: The results suggest that patients reported severe outcomes in physical and psychological. Patients with severe physical showed significantly higher pain levels. Systematic assessment of patient-reported outcomes via inexpensive measures can be a key starting point for the management of patients' symptoms, especially in countries where palliative care services are less organised. Introducing systematic assessment of reported outcomes tools in local practice can help staff perform assessments with a low budget. Nurse-led interventions can be implemented to provide holistic care for physical and psychological symptoms.

Keywords: cancer; palliative care outcomes scale; patient-reported outcomes

Introduction

Indonesia has a high burden of communicable diseases and noncommunicable diseases (Ministry of Health of the Republic of Indonesia, 2023), with a sharp increase in cancer incidence (Mahendradhata et al., 2017). The incidence of cancer is 14 cases per 1,000 people, with 70% of patients diagnosed in the end stages; however, only half of them continue with medical treatment (Ministry of Health of the Republic of Indonesia,

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2019). The significant increase in the prevalence of cancer has led to severe problems, as cancer treatment centres can treat only 15% of patients. In general, only three hospitals with 434 beds are available to serve 3,676,463 patients with cancer (Ministry of Health of the Republic of Indonesia, 2023). Approximately 300 patients with cancer visit hospitals every day and can wait up to three months for their first chemotherapy treatment due to the limited number of hospitals. This situation delays treatment and shows that appropriate supportive and palliative care is limited (Ministry of Health of the Republic of Indonesia, 2023).

Worldwide, the Hospice and Palliative Care global report indicated that almost 53 million adults need palliative care globally, most of whom were aged 50-69 years (27%) and aged 20-47 years (26%) in 2020. The proportion was relatively high in all regions; however, 76% of those 53 million live in upper- and lower-middle-income countries, with the highest ratio in the adult population being in low-income countries (Connor et al., 2020).

Patients in Indonesia face issues with autonomy that make them unable to choose suitable treatment unless the family agrees (Iskandarsyah et al., 2014; Schröder-Butterfill & Fithry, 2014). There is a culture in which sick people belong to their families (Schröder-Butterfill & Fithry, 2014; Schröders et al., 2017; Wessner, 2018). Even if the government is applying for health insurance, the family still needs expenses while seeking cancer treatment at the referral hospital (Wessner, 2018). Therefore, treatment depends on the burden of family availability. This can also place physical, emotional, and financial burden on patients and family caregivers during treatment (Purba et al., 2022).

Assessing cancer-related patient-reported outcomes (PROs) is limited in Indonesia. A prior study identified the need for cancer management at the clinic level to overcome the low screening, late diagnosis and treatment, and awareness of unrealistic beliefs regarding cancer among the population (Iskandarsyah et al., 2014; Schröders et al., 2017). These misconceptions delay treatment, and people tend to believe traditional healers (Iskandarsyah et al., 2013). In line with a prior study among noncommunicable diseases in Yogyakarta, the number of people who needed palliative care identified by nurses was 17.7%, and that identified by physicians was 9.7% (Effendy et al., 2022). These findings highlight the lack of patient outcome measurements in Indonesia and show the utility of PROMs for both by physicians and nurses in Indonesia.

Nurses have a strategic role in assessing PROs. The PROs reported the patient's condition from their point of view without healthcare or the family caregiver's interpretation (Johnston et al., 2016). It is a direct patient indicator without clinician interpretation (Almeida et al., 2021). The PROs could also help but multidisciplinary teams predict

interventions for elderly individuals with cancer. The nurse, as the first contact to the patient, can collect the data from the patient.

The more detailed and reliable the instrument used to measure PROs is, the more valid the information from the patient is so that crucial information from PROs enhances decision-making for clinicians, patients, and policy (Gagnier & Johnston, 2019). A previous study revealed that patients who completed PROs were more motivated to participate in their care (Kane et al., 2018). A routine PRO assessment should be performed every day to predict the probability of dying in the ward (Coym et al., 2020). In addition, PROs are a significant indicator of medical effects (Kotronoulas et al., 2019). It can be performed online to reduce costs and receive fast feedback from healthcare providers (Kotronoulas et al., 2016). It is also beneficial to report results across multicentre settings (Furlong et al., 2019) by empowering patients to report and prioritise their needs (Kotronoulas et al., 2017). The patient perspective promotes patient-centred care by including the PROs instrument (Tractenberg et al., 2017).

The PROs are the basic data to ensure the health care providers the suitable intervention to reduce the symptoms, which in turn increase the patients' quality of life. The implications of self-reported outcomes will benefit the patient as they can measure their own symptoms. Person-centred care means that the patient is involved in their care (McCormack, 2020). They should have an opportunity to choose and evaluate the interventions they have. Their person-centred outcome should result in satisfaction with care, involvement with care, a feeling of wellbeing and the creation of a therapeutic culture (McCormack, 2020). On the other hand, palliative care staff should provide a service to satisfy the patient and to deliver person-centred outcome (McCormack & McCance, 2017). However, little is known about the relationship of other patient characteristics with PROs. Understanding these effects can help nurses to provide interventions, evaluate how an intervention works, and determine how and why it works, as well as identify which interventions work, including their methods and criteria for success (McCormack & McCance, 2017). This study aimed to describe the severity of PROs patients with cancer in West Java Province, Indonesia and how it links to patients' characteristics.

Materials and Methods

This cross-sectional PROs survey was part of a mixed methods study (Purba et al., 2025). This study was conducted at Hasan Sadikin Hospital and 13 Shelters around the hospital in West Java Province, Indonesia. The population was 700 people with cancer, and the sample size was 248–254 people, determined using the Krejcie and Morgan formula (Taherdoost, 2017). A total of 227 samples

were recruited using convenience sampling with the inclusion criterion of adult patients with cancer

Demographic data collected included: age, sex, marital status, occupation, ethnicity, education level, and distance to the hospital. Clinical data were obtained from medical records, including the diagnosis, type of cancer, comorbidities, and duration since diagnosis. One of the main PRO measures in palliative care is the Integrated Palliative Care Outcomes Scale (IPOS). It was first developed in 1999 by Hearn and Higginson as the Patient Outcomes Scale (POS) to evaluate outcomes for patients with advanced cancer (Hearn & Higginson, 1999). The IPOS aims to measure the effects of patients' physical and psychological needs to help health care provide suitable interventions and observe significant changes in patients. The IPOS questionnaire focuses on two areas; physical and emotional symptoms (Hearn & Higginson, 1999). The IPOS has good construct validity and reliability (Spearman rho =0.43–0.80, with an internal consistency of Cronbach's alpha =0.65 (Bausewein et al., 2011). It has 10 items to assess physical symptoms; psychological, emotional, and spiritual needs, and the provision of information and practical support (Collins et al., 2015) tool has been translated into several languages, tested for its psychometrics, and found to be valid and reliable. The IPOS questionnaire has never been used in Indonesia. The researchers conducted a back translation by three native speakers of Indonesia and English. Internal consistency of the translated IPOS was good with a Cronbach's alpha value of 0.838. The level of need and burden of patients with cancer and how nurses can provide lead interventions constitute a part of this research. The IPOS begins with an open-ended questionnaire asking about the greatest number of problems, followed by 10 physical outcomes related to cancer or the treatment effects. The following questions ask about assessing the physical, emotional, psychological, spiritual, support, family and provision of information. One addition is asking who helps the patient fill in the questionnaires (Bausewein et al., 2011). Five response options are given on a Likert scale ranging from not at all (0) to overwhelmingly (4). The higher the scores are, the higher the outcomes. Only one answer is allowed for each question. The patient chose a score depending on their condition. The total score reflects their original condition. The overall profile score helps understand the overall experience and their needs and strengths at a specific time. Data were analysed using statistical chi-square test to see the correlation between demographic data and the PRPs.

To avoid selection bias, the researcher approached all the participants with cancer in the hospital and shelters. Participants were relatively homogeneous, as they shared similar geographic, educational, and socioeconomic backgrounds. To avoid justify external validity, researcher conducted visits to every shelter and also to the cancer clinic

every day so that all participants who fulfilled the criteria had the same opportunity to be recruited. To ensure that the patient choose the best answer for themselves, the researcher informed the benefit of the reported outcomes to gain the best intervention to them. The family members only assisted to check the answer when patients were too tired to complete the questionnaire themselves. To minimise blank answers, the researcher checked the respondent why they did not fill out all the questions. In most cases, they needed more information about the most appropriate answer based on their condition. After clarifying the information, the researcher asked the participants to complete all the questions so that there was no missing answer.

Data are analysed using SPSS version 42 (Ewertowski et al., 2018); Univariate analysis was conducted to show descriptive statistics (means-median, frequency, percentage). Beside descriptive analysis, additional correlational analysis was also conducted to further describe what the respondents' characteristics link to the respondents' PROs level.

Ethical consideration

The researcher respected the participants' rights, including respect for persons, beneficence, and justice. The respondent recruitment was conducted voluntarily. The researcher was able to recruit participants quickly, as every day around 150 patients with cancer attend the clinic and there are 10 new residents in 13 shelters. Research participants were free to withdraw at any point if they wished without any requirement to justify their decision. No participant dropped out of the study.

Ethics approval was obtained from the University of Glasgow ethics committee (Project No: 200180198) and ethics approval from the hospital (number LB.02.01/X.6.5/344/2019).

Results

All participants accepted the privacy notice and signed the patient information sheet before joining the research (Purba et al., 2022). Around 227 samples were recruited between November 2019 and February 2020 (90.7% participation rate). Just over 75% of the participants completed this questionnaire with family assistance (77.5%). Most participants were female (160, 70.5%), married (185;81.5%), mean age 45.3 years (SD 12; 16–75), Sundanese (84.6%), housewives (51.5%), primary school education (131, 57.7%), mean distance from the patients' hometowns to the hospital was 149.3 km (SD 271.67), had been diagnosed with breast cancer (15.9%) out of 32 types of cancer, 193 participants without comorbidities (85%), and the mean period of illness was 1.69 years (SD 2.7) (Table 3).

Table 3 outlines that almost all the participants had high scores. The total IPOS mean score was 30.2 (SD 13.0, range 3–62, possible maximum 68). The mean physical outcome score was 16.0 (SD

Table 1. The participant's recruitment process and the result

Process	Patient	Family caregivers
Questionnaires Distributed	250	250
Questionnaires returned	227	220
Response rate (%)	91%	88%
Reason for not returning the questionnaires:		
Not able to	3	7
Had died	11	0
Go back home temporarily	3	15
Did not understand how to complete it	3	3
Lost the questionnaire accidentally	3	5

9.4, range 0-40, possible maximum 40), and the mean psychological outcome score was 14.1 (SD 4.5, range 2-24, possible maximum 24). The most prominent physical symptoms experienced included pain (50%), weakness (27.8%), a sore mouth (18.5%), poor mobility (17.6%), and drowsiness (16.3%). Most of them reported not experiencing constipation (56.8%), vomiting (52.9%), or shortness of breath (49.3%).

Similarly, the top emotional concerns reported were the anxiety of family or friends (45.4%), practical problems resulting from the illness (38.3%), feeling at peace (23.3%), not feeling depressed and sharing their feelings with family or friends as much as they wanted (21.6%). Notably, most patients reported not feeling depressed (27.8%), were able to share their feelings (22.5%) and did not have as much information as they wanted (15%). Beyond the 10 suggested outcomes, 73.6% of participants reported that they did not have other symptoms, and only 18.1% reported that they had one other symptom.

A chi square test was carried out to see whether there was a correlation between the severity and respondents' characteristics. Table 4 shows α for performance and pain scale are 0.001, which is < 0.005 . It means H_0 is rejected. It can be concluded that there is a significant correlation between performance and pain and PROs severity while other factors do not have correlation ($\alpha 0,001$).

Discussion

Almost all the participants had high scores mostly in physical symptoms (pain, weakness, and sore mouth) and emotional concerns (anxiety of family or friends, practical problems resulting from the illness, feeling at peace). Around 70% of the patients have been diagnosed with end-stage cancer with symptom as large tumour, cancerous wounded, bleeding, made the patient suffer with pain. Close to 50% of the participants reported high pain levels outcomes. This finding was similar to that of a prior study concluding that pain remains a common symptom among patients with cancer, a typical symptom in developing countries where there is

limited access to painkillers, which impacts their quality of life (Silvoniemä et al., 2012). Even though the World Health Organisation (WHO) has already recommended reducing the layer used for painkiller access, patients in Indonesia still face difficulties in receiving painkiller such as morphine (Setiabudy et al., 2015). With respect to the policy in Indonesia, only physicians in the referral hospital can prescribe morphine. It is dispensed only in a pharmacy in large cities; the patients should be present in front of the physician, and the amount of the drugs given to the patients can cover their needs for only one month. Therefore, rural patients face many barriers to receiving painkillers (Knaul et al., 2017). On the other hand, the painkiller policy makes patients face many barriers. The pain experience is an uncomfortable situation for people with cancer. Moreover, the annual consumption of morphine in Indonesia is only 0.054 mg/capita. As a result, people die from pain (Setiabudy et al., 2015).

The result from PROs can be used to standardised pain assessment protocols. For example, the patient assessment should be performed in the community by physician or nurse and the result can be sent to the physician in the tertiary hospital. The painkiller dispensing should be applied in the primary health care. Furthermore, the community-based opioid stewardship also can be done as the alternative solutions to ensure patients have easy access to the painkiller.

In comparison, four-fifths of the 61 million patients lived in low and middle-income countries with limited access to palliative care. Moreover, half of the global population receives only 1% of the available morphine; this causes them to suffer from severe pain and health-related complaints (Knaul, 2017). Vietnam consumes 9% of painkillers per capita, India consumes 4%, and China consumes 16% (Knaul et al., 2017). Compared with the United States of America, which has less than 5% of the world's population but consumed approximately 30% of the world's opioids in 2009, nearly 40% of the European Union in 2021 consumed opioids. Although the World Health Organisation has stated that all countries reduce the number of controlled drugs, many countries still face difficulty in having morphine. For example, some travel costs are

Table 2. Demographic data of the patient participants (n=227)

Variable/Category	Patients
	Mean (SD); Range
Age	45.3 (12); 16-75
Distance home to hospital (km)	149.3 (271.67); 2-3000
Duration since been diagnosed as cancer	1.69 (2.7); 0-20 years
	n/+%
Gender	
Female	160 (70.5)
Age in years	
<36	40 (17.6)
36-55	145 (63.9)
>55	42 (18.5)
Marital status	
Married	185 (81.5)
Single	14 (6.2)
Widow	28 (12.3)
Ethnicity	
Sundanese	192 (84.6)
Javanese	30 (13.2)
Others	5 (2.2)
Education level	
No school	3 (1.3)
Primary	131 (57.8)
Junior	42 (18.5)
High	47 (20.7)
Bachelor	4 (1.7)
Duration since been diagnosed as cancer	
0-6 months	81 (35.7)
>6-11 months	68 (30.0)
1-2 years	34 (15.0)
>2 years	44 (19.4)
Pain level (face scale)	
Light	22 (9.7)
Moderate	67 (29.5)
Severe	138 (60.8)
Distance (home-hospital in km)	
1-200	196 (86.4)
>200	31 (13.7)

SD=standard deviation: Standard deviation measures the dispersion of a data set relative to its mean.
km=kilometres

needed for people in small cities in Nigeria to find morphine. In Morocco, prescriptions could be approved only after exclusive application. Physicians in the Philippines should pay for prescription forms. In Turkey, physicians have difficulty obtaining painkiller forms. Only referral hospitals can dispense opioids

in China (Li et al., 2018). Pain reduces quality of life, including sleep quality.

Fatigue can be related to cancer, treatment, and psychological factors. It could worsen participants' health status and could persist for several years. One study reported that 72% of participants

Table 3. Patients' symptoms and concerns of Pros according to the IPOS (n=227)

No	Item	Not at all		Slightly		Moderately		Severely		Overwhelmingly	
		f	%	f	%	f	%	f	%	f	%
1	A Pain	31	13.7	32	14.1	35	15.4	81	35.7	114	50.2
2	Shortness of breath	112	49.3	22	9	39	17.2	22	9.7	32	14.1
3	Weakness	49	21.6	34	15	45	19.8	36	15.9	63	27.8
4	Nausea	93	41	38	16.7	47	20.7	20	8.8	29	12.8
5	Vomiting	120	52.9	34	15	34	15	13	5.7	26	11.5
6	Poor appetite	67	29.5	2	11.9	54	23.8	40	1.6	39	1.2
7	Constipation	129	56.8	23	10.1	29	12.8	17	7.5	29	12.8
8	Sore mouth	5	33	40	17.6	41	18.1	29	12.8	42	18.5
9	Drowsiness	83	36.6	24	10.6	46	20.3	37	16.3	37	16.3
10	Q Poor mobility	93	41	34	15	39	17.2	21	9.3	40	17.6
12	Feeling anxious about your illness or treatment.	20	8.8	10	4.4	61	26.9	47	20.7	89	39.2
13	Have any of your family or friends been anxious or worried about you?	8	3.5	9	4	30	13.2	77	33.9	103	45.4
14	Have you been feeling depressed.	63	27.8	29	12.8	52	22.9	34	15	49	21.6
15	Have you felt at peace?	30	13.2	30	13.2	70	30.8	44	19.4	53	23.3
16	Have you been able to share how you are feeling with your family or friends as much as you wanted?	51	22.5	27	11.9	52	22.9	48	21.1	49	21.6
17	Have you had as much information as you wanted?	34	15	31	13.7	102	44.9	25	11	35	15.4
18	Have any practical problems resulting from your illness been addressed?	17	7.5	16	7	31	13.7	6	33.5	87	38.3
11	Number of other symptoms.	None		One		Two		Three		Four	
		f	%	f	%	f	%	f	%	f	%
		167	73.6	41	18.1	14	6.2	5	2.2	0	0
19	How did you complete this questionnaire?	Myself		Family		Staff		Mixed			
		f	%	f	%	f	%	f	%		
		1	0.4	164	72.2	6	2.7	56	25.4		

* Total number of participants answering.

A* A list of physical symptoms, which participants may or may not have experienced.

Q* A List of psychological/emotional symptoms.

The bold items are the most reported outcomes

reported that pain made them more fatigued (Matias et al., 2017). These findings support those of prior studies where weakness, fatigue, or exhausted-related cancer were the most common symptoms of cancer treatment and the most distressing syndrome (Poort et al., 2017). The uniqueness of fatigue requires multifactorial treatments, including both physical and psychological factors. Several studies have indicated that fatigue is associated with the hypothalamic adrenal system, nervous system, other conditions (Tong et al., 2019), and

maladaptive immune systems (Black et al., 2018) and is correlated with poor quality of life.

Sore mouth was reported which can be related to low water intake and tropical weather, where the temperature is between approximately 27 degrees Celsius every day. Too weak to move could prevent people from drinking water from moving from the bed to the toilet. However, patients and family caregivers should understand that patients need enough hydration all day. They could prevent this by providing drinking water next to the patient's bed.

Table 4. Statistical analysis (Chi Square test)

PROs	0-6 Months N	%	7-12 months N	%	>12 months N	%	Total	p-value
Duration since got cancer								0.0589
Low outcomes	50	22.02	47	20.7	56	24.66	22	
High outcomes	29	12.77	22	9.69	23	10.13	69	
Total	79		69		79		227	
Distance from home to the hospital								0.623
Low outcomes	1-200km		201-500km		>500km			
High outcomes	132	58.14	19	8.37	2	0.8%		
Total	65	28.63	7	3.08	2	0.8		
Age category								0.737
	<36yo		36-55		>55			
Low outcomes	17	7.48	25	11.01	111	48.89		
High outcomes	10	4.40	14	6.16	50	22.01		
Total	27		39		161			
Gender								0.416
	Male		Female					
Low outcomes	44	19.38	109	48.01				
High outcomes	23	10.13	51	22.24				
Total	67		160					
Ethnicity								0.152
	Sunda		Jawa		Sumatra		Sulawesi	
Low outcomes	124	54.62	24	10.57	1	0.44	4	
High outcomes	68	29.95	6	2.64	0	0	0	
Total	192		30		1		4	
Employment								0.416
	Farmer	Trader	Entrepreneur	Jobless	Housewife	Others	General Worker	
Low outcomes	15 (6.60%)	4(1.76)	16 (7.04)	17 (7.4)	77 (33.92)	10 (4.4)	12 (5.2)	
High outcomes	4	0 (0)	10 (4.4)	11 (4.8)	40 (17.62)	1 (0.44)	73.08)	
Total	19	4	26	28	117	11	85	
Education level								0.614
	No School	Primary	Junior	Senior	Bachelor			
Low outcomes	1 (0.44)	88 (38.76)	28(12.33)	34 (14.97)	2 (0.8%)			
High outcomes	2 (0.8%)	43 (18.94)	14 (6.16)	13 (5.7)	2 (0.8%)			
Total	3	131	42	47	4			
Comorbid								0.168
	NONE		1-3 other diseases					
Low outcomes	133	58.59	20	0.88				
High outcomes	60	26.43	14	6.16				
Total	193		34					

Cont. Table 4. Statistical analysis (Chi Square test)

PROs	0-6 Months N	%	7-12 months N	%	>12 months N	%	Total	p-value
Performance (ECOG)								0.001
	Light		Moderate		Very Sick			
Low outcomes	20	8.8	58	25.55	75	33.03		
High outcomes	2	0.8%	9	3.96	63	27.75		
Total	22		67		138			
Pain level								0.001
	Light		Moderate		Worst pain			
Low outcomes	26	11.45	37	16.29	37	16.29		
High outcomes	2	0.8%	8	3.52	8	1.57		
Total	28		45	184				

In line with the findings of a previous study, the symptom cluster of nausea, vomiting, and loss of appetite were common among people with cancer (Pirri et al., 2013), leading to sore mouth and malnutrition. Poor appetite in people with cancer is also the most common syndrome related to cancer treatment such as chemotherapy and radiotherapy. People with cancer need supportive care to improve their quality of life (Kotronoulas et al., 2017a; Kotronoulas et al., 2017b). The family approach of talking about food, feelings, and reciprocity positively affects the patient's body weight (Hopkinson & Richardson, 2015).

Weakness could lead to poor mobility. Most of the respondents were in advanced stages of cancer, which made them suffer from fatigue. A previous study reported that health conditions can be maintained with adequate self-care in physical, psychosocial, emotional and functional domains (Nasution & Afiyanti, 2024). Doing more activities could improve patients' quality of life. Thus, keeping patient's mobile will help reduce poor mobility outcomes. Social support from family members, especially the husband or wife, is the support needed to achieve successful outcomes (Winarti, Prasetyanti, & Said, 2021).

Drowsiness has been reported to be significantly associated with a desire for death, so it should be assessed routinely (Yennu et al., 2014). Symptom monitoring has clinical implications in palliative care since advanced cancer patients have a high symptom burden (Newcomb et al., 2020).

As a top emotional concern, anxiety of the family or friends was similar to that of a prior study that reported that family anxiety was the typical missing value (Sakurai et al., 2021). Most participants in this study stayed in the shelter with one of their family caregivers, which automatically made the relative unable to do their job. This condition might explain why almost 100% of the participants worried about

their families. People with depression or anxiety consequences have multiple complaints (Nipp et al., 2017).

Most of the practical problems resulting from the illness in this study were financial issues, which are common problems among patients in Indonesia. Moreover, if they were breadwinners, it was more challenging to support their lives. Financial difficulties significantly reduce quality of life. The government funded payments for 96.1 million people, as stipulated in the Minister of Social Affairs Decree No. 1, 2021 (Indonesia National Health Insurance Agency (BPJS Kesehatan), 2019). This means that patients can access health care services without any payment. However, they also need money during their stay in the hospital or shelter.

It was understandable that people with pain and anxiety rarely felt at peace because they struggled with symptoms and emotional challenges. People with cancer are more likely to experience practical spiritual, physical, and emotional problems (Nguyen, Do, & Pham, 2021). A prior study reported that spiritual support and talking to someone could increase anxiety (Ross & Austin, 2015). Spiritual support is already well known as enormous support for people to feel peace. However, most people do not receive enough spiritual and psychological support from professional health care providers. The spiritual legacy enabled patients to discuss critical issues regarding their beliefs and values (Piderman et al., 2017). Interestingly, females participate more in religious rituals and are more religious than males are (Munoz et al., 2015).

Many participants did not feel depressed and could share their feelings with family or friends as much as they wanted. If patients express their wishes, the family burden decreases because they know what to do after (Green et al., 2015). This symptom might be associated with participants from Asian communal cultures, whereby families

and friends are counted as family. Indonesia has communal culture where other relatives are counted as a family (Subandi et al., 2021). This allowed them to share their information about the disease and treatment. This culture makes people feel safe under the influence of their large family. When a family member suffers from chronic illness, it automatically affects other relatives (Wessner, 2018). It is common to donate money to relatives when they got sick (Chan, Menon, & Goh, 2015).

The support from psychologists may increase patients' use of constructive strategies. Several studies have shown that patients who receive frequent sessions reliably receive support (Scheffold et al., 2018). Another study revealed that faith in God was the main component of patients' meaning of life that helped them cope with anxiety and death (Testoni et al., 2018).

Depression and anxiety in people with cancer are commonly related to pain, treatment, body function and structural changes, job loss, and authority. Hence, healthcare providers should be aware of this symptom. Pathological symptoms can be considered if the patient rejects treatment (Pitman et al., 2018). Anxiety and depression are also strongly associated with sexual dysfunction and poor quality of life (Akyol et al., 2015). Some people perceived that cancer was guilt or shame that increased their anxiety.

People who are sick tend to receive information from their family/friends in Indonesia (Subandi et al., 2021) without rechecking whether there is incorrect information. Patient-reported outcomes could prevent patient and family burdens because it can be used to monitor and evaluate symptoms and burdens and provide suitable interventions at home (Kotronoulas, 2021). Since families play a vital role in patient treatment and emotional support, they should have the correct information. Healthcare professionals could offer self-management programs to those people (Cheng & Kotronoulas, 2020).

People in East Asia share a similar culture and love chatting even with strangers. This culture currently seems to exist since 65% of the participants in this study shared their feelings with family or friends as much as they wanted. This culture benefits patients. However, self-awareness and correct information should be spread broader to ordinary people to support or provide accurate information to patients. For example, In India, families still believe in myths, traditional healing, and stigma (Alexander & Murthy, 2020). People with cancer need supportive care to improve their quality of life (Kotronoulas et al., 2017a; Kotronoulas et al., 2017b). Accurate information has contributed to better survival.

All participants needed psychological support to help patients die in peace and to help families in the mourning period. The patient has a right to have their needs met, to live in the here and now, to enjoy the moment and receive effective palliative

care (Dönmez & Johnston, 2020). If they understood this concept, the staff could help patients live in the moment until they died in peace (Dönmez, Alici, & Borman, 2021). Nurses can identify this stress by initially discussing how patients want to be treated at the end of life, including issues such as support while dying, autonomy, medication, respecting personhood and treating someone like a human being (Johnston et al., 2021). The dignity issue might be subjective and not always explicitly captured in conversation, so nurses should explore this issue (Johnston et al., 2015).

Statistical analysis shows that all factors partially do not have a partial correlation on the PROs value except performance and pain scale. These findings in line with the previous study where the pain level was the most outcome reported among the patients with cancer (Duff et al., 2021). Hence, pain symptoms management should be provided to the patients. There is a correlation between the characteristic and severity of PROs (0.445). Furthermore, there is the significant influence of the dependent variable on PROs (15.3%). This data supports that the type of cancer and the time since diagnosed have effect on the patient outcomes (Yennu et al., 2014). Using PROs can reduce the feeling of embarrassment between patient if they felt uncomfortable to tell their sensitive issues directly to the nurse (Lind et al., 2019).

Information about PROs produces a clinical description of the patient, improves symptom assessment, improves the interaction between staff and patient, increases patient satisfaction, and supports person-centred care (Johnston et al., 2017). The palliative performance is to classify a patient according to their functional impairment, compare the effectiveness of therapies, and assess the prognosis of a patient (Zou et al., 2024). The nurse should assess rating performance scale to help better decision making for patient, especially relate to their chemotherapy (Neeman et al., 2019). Healthcare providers should provide suitable interventions for people with cancer in Indonesian settings in terms of their outcomes. Interventions based on PROs have become standard treatments for evaluating services (Johnston, Walker, & Lakzadeh, 2019).

Strength and Limitations of the study

This study holds some strength, including the instrument used and the data collected. IPOS was used in the Indonesian language for the first time. IPOS can measure the actual reported outcomes between patients with cancer with good validity and reliability. A significant number of participants, 227 out of 250 targets (91%). Disparity of the participants showed that the Indonesian version could describe a wider population. This heterogeneity stems from demographic data, including gender, age, education, occupation, cancer type, duration of illness, supportive needs, and distance to the hospital. These results are critical for providing better

interventions for people with cancer in Indonesia. Identifying the reported outcomes can help health care providers provide comprehensive nurse-led interventions in palliative care.

Beside those strengths, there were some limitations must be acknowledged. The study needs to be replicated in a wider Indonesian cancer patient population. Even when the sample reached a >90% rate, a specific background is needed to identify specific needs. Additionally, the sample comes from one cancer centre in Indonesia, which cannot generate a population in Indonesia. However, this population represents the second largest ethnic population, with approximately 46 million lives in this hospital setting (Purba, Johnston, & Kotronoulas, 2022).

Implication of the study

Implications for nursing knowledge; the findings inform hypothesis generation for targeted interventions so that need future validation across cancer types and settings by using assessment of supportive care needs via PROMs in local practice. Implications for practices is providing time to discuss any questions and concerns of patients reported outcomes and families using simple language. Future research can explore many issues in providing and running a palliative care system, including cultural barriers and facilitators in running the palliative care services.

Conclusions

The participants reported the severity of their PROs in both physical and psychological domains. Almost all patients reported pain as a physical symptom, and family or friends worried as the most common psychological symptom. There is a relationship between performance and pain scale and severity of PROs among people with cancer in West Java (α 0,001). Other characteristics (gender, age, education level, cancer types, duration since diagnosis, employment, marital status, comorbid) do not show the correlation. The routine PROM uses and nurse-led interventions should be done to ensure the patient outcomes can be addressed every day particularly for patient at the end of life.

Declaration of interest

We have no conflicts of interest to disclose. All authors contributed to the design of the research concept. All the authors contributed to the preparation of the manuscript. CIHP performed the data collection and statistical analysis. BJ & GK performed the statistical analysis and provided discussions and conclusions.

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Data availability

Supporting data from this study are available from the corresponding author upon request.

References

- Akyol, M., Ulger, E., Alacacioglu, A., Kucukzeybek, Y., Yildiz, Y., Bayoglu, V., . . . Tarhan, M. O. (2015). Sexual satisfaction, anxiety, depression and quality of life among Turkish colorectal cancer patients [Izmir Oncology Group (IZOG) study]. *Japanese Journal of Clinical Oncology*, 45(7), 657-664. <https://doi.org/10.1093/jjco/hyv051>
- Alexander, A., & Murthy, R. (2020). Living with cancer: Urgent need for emotional health support. *Indian Journal of Cancer*, 57, 360. https://doi.org/10.4103/ijc.IJC_113_19
- Almeida, A., Martins, T., & Lima, L. (2021). Patient-reported outcomes in sarcoma: A scoping review. *European Journal of Oncology Nursing*, 50, 101897. <https://doi.org/10.1016/j.ejon.2021.101897>
- Bausewein, C., Daveson, B., Benalia, H., Simon, S., & Higginson, I. (2011). Outcome measurement in palliative care the essentials (Higginson Ed.). London: London, King's College London.
- Black, D. S., Cole, S. W., Christodoulou, G., & Figueiredo, J. C. (2018). Genomic mechanisms of fatigue in survivors of colorectal cancer. *Cancer*, 124(12), 2637-2644. <https://doi.org/10.1002/cncr.31356>
- Chan, N., Menon, S., & Goh, C. R. (2015). Policies on palliative care for older people in Asia. *Palliative Care for Older People: A Public Health Perspective*, 60.
- Cheng, L., & Kotronoulas, G. (2020). How effective are self-management interventions in promoting health-related quality of life in people after primary treatment for breast cancer? A critical evidence synthesis. *European Journal of Oncology Nursing*, 47, 101776. <https://doi.org/10.1016/j.ejon.2020.101776>
- Collins, E., Witt, J., Bausewein, C., Daveson, B., Higginson, I., & Murtagh, F. (2015). A systematic review of the use of the palliative care outcome scale and the support team assessment schedule in palliative care. *Journal of pain and symptom management*, 50(6), 842-853.e819. <https://doi.org/10.1016/j.jpainsymman.2015.07.015>
- Connor, S., Morris, C., Jaramillo, E., Harding, R., Cleary, J., Haste, B., . . . Radbruch, L. (2020). Global atlas of palliative care, 2nd edition. Retrieved from <http://www.thewhpca.org/resources/global-atlas-on-end-of-life-care>
- Coym, A., Ullrich, A., Hackspiel, L. K., Ahrenholz, M., Bokemeyer, C., & Oechsle, K. (2020). Systematic symptom and problem assessment at admission to the palliative care ward – perspectives and prognostic impacts. *BMC palliative care*, 19(1), 75. <https://doi.org/10.1186/s12916-020-01511-1>

- [org/10.1186/s12904-020-00576-3](https://doi.org/10.1186/s12904-020-00576-3)
- Dönmez, A., Alici, N., & Borman, P. (2021). Lived experiences for supportive care needs of women with breast cancer-related lymphedema: A phenomenological study. *Clinical Nursing Research*, 30(6), 799-808. <https://doi.org/10.1177/1054773820958115>
- Dönmez, Ç., & Johnston, B. (2020). Living in the moment for people approaching the end of life: A concept analysis. *International Journal of Nursing Studies*, 108, 103584. <https://doi.org/10.1016/j.ijnurstu.2020.103584>
- Duff, J., Cornell, A., Jayanthi, S., Tharakanara, S., Romero, P., & Davis-Castro, C. (2021). Consumption of prescription opioids for pain: A comparison of opioid use in the United States and other countries [Online]. USA: Coordinator Analyst in Health Policy, Analyst in Global Health and International Development, Research Librarian. Available: <https://crsreports.congress.gov> [Accessed 30 Jan 2022].
- Effendy, C., Silva, J., & Padmawati, R. S. (2022). Identifying palliative care needs of patients with non-communicable diseases in Indonesia using the SPICT tool: A descriptive cross-sectional study. *BMC Palliat Care*, 21(1), 13. <https://doi.org/10.1186/s12904-021-00881-5>
- Ewertowski, H., Tetzlaff, F., Stiel, S., Schneider, N., & Jünger, S. (2018). Primary palliative care in general practice – Study protocol of a three-stage mixed-methods organizational health services research study. *BMC palliative care*, 17(1), 21. <https://doi.org/10.1186/s12904-018-0276-6>
- Furlong, E., Darley, A., Fox, P., Buick, A., Kotronoulas, G., Miller, M., . . . Maguire, R. (2019). Adaptation and implementation of a mobile phone-based remote symptom monitoring system for people with cancer in Europe. *JMIR Cancer*, 5(1), e10813. doi:10.2196/10813
- Gagnier, J. J., & Johnston, B. C. (2019). Poor quality patient reported outcome measures bias effect estimates in orthopaedic randomized studies. *J Clin Epidemiol*, 116, 36-38. <https://doi.org/10.1016/j.jclinepi.2019.07.012>
- Green, M. J., Schubart, J. R., Whitehead, M. M., Farace, E., Lehman, E., & Levi, B. H. (2015). Advance care planning does not adversely affect hope or anxiety among patients with advanced cancer. *Journal of Pain and Symptom Management*, 49(6), 1088-1096. <https://doi.org/10.1016/j.jpainsymman.2014.11.293>
- Hearn, J., & Higginson, I. (1999). Development and validation of a core outcome measure for palliative care: The palliative care outcome scale. *Palliative Care Core Audit Project Advisory Group. BMJ Quality & Safety*, 8(4), 219-227. <https://doi.org/10.1136/qshc.8.4.219>
- Hopkinson, J. B., & Richardson, A. (2015). A mixed-methods qualitative research study to develop a complex intervention for weight loss and anorexia in advanced cancer: The family approach to weight and eating. *Palliative Medicine*, 29(2), 164-176. <https://doi.org/10.1177/0269216314556924>
- Indonesia National Health Insurance Agency (BPJS Kesehatan). (2019). BPJS for health: Financial management report and financial report 2018 (Audit). Jakarta: Indonesia National Health Insurance Agency (BPJS Kesehatan).
- Iskandarsyah, A., de Klerk, C., Suardi, D. R., Soemitro, M. P., Sadarjoen, S. S., & Passchier, J. (2013). Satisfaction with information and its association with illness perception and quality of life in Indonesian breast cancer patients. *Support Care Cancer*, 21(11), 2999-3007. <https://doi.org/10.1007/s00520-013-1877-5>
- Iskandarsyah, A., de Klerk, C., Suardi, D. R., Soemitro, M. P., Sadarjoen, S. S., & Passchier, J. (2014). Psychosocial and cultural reasons for delay in seeking help and nonadherence to treatment in Indonesian women with breast cancer: A qualitative study. *Health Psychol*, 33(3), 214-221. <https://doi.org/10.1037/a0031060>
- Johnston, B., Flemming, K., Narayanasamy, M. J., Coole, C., & Hardy, B. (2017). Patient reported outcome measures for measuring dignity in palliative and end of life care: A scoping review. *BMC Health Services Research*, 17(1), 574. <https://doi.org/10.1186/s12913-017-2450-6>
- Johnston, B., Larkin, P., Connolly, M., Barry, C., Narayanasamy, M., Östlund, U., & McIlpatrick, S. (2015). Dignity-conserving care in palliative care settings: An integrative review. *Journal of clinical nursing*, 24(13-14), 1743-1772. <https://doi.org/10.1111/jocn.12791>
- Johnston, B. C., Miller, P. A., Agarwal, A., Mulla, S., Khokhar, R., De Oliveira, K., . . . Guyatt, G. H. (2016). Limited responsiveness related to the minimal important difference of patient-reported outcomes in rare diseases. *Journal of Clinical Epidemiology*, 79, 10-21. <https://doi.org/10.1016/j.jclinepi.2016.06.010>
- Johnston, B. M., McCauley, R., Rabbitte, M., McQuillan, R., Honohan, C., Mockler, D., . . . May, P. (2021). Evidence on the effectiveness and cost-effectiveness of out-of-hours palliative care. *Palliative Medicine*, 35(2), 367-368. <https://doi.org/10.1177/0269216320969555>
- Johnston, K., Walker, D., & Lakzadeh, P. (2019). Characterizing the health-related quality of life burden of overactive bladder using disease-specific patient-reported outcome measures: A systematic literature review. *Advances in therapy PMC*, 36, 14. <https://doi.org/10.1007/s12325-019-0880-8>
- Kane, P. M., Ellis-Smith, C. I., Daveson, B. A., Ryan, K., Mahon, N. G., McAdam, B., . . . Koffman, J. (2018). Understanding how a palliative-specific patient-reported outcome intervention works to facilitate patient-centred care in advanced heart failure: A qualitative study.

- Palliative Medicine*, 32(1), 143-155. <https://doi.org/10.1177/0269216317738161>
- Knaul, F., Farmer, P., Krakauer, E., De Lima, L., Bhadelia, A., Kwete, X., . . . Rajagopal, M. (2017). Alleviating the access abyss in palliative care and pain relief—an imperative of universal health coverage: The lancet commission report. *The Lancet Commissions*, 391(10128), 63. [https://doi.org/10.1016/S0140-6736\(17\)32513-8](https://doi.org/10.1016/S0140-6736(17)32513-8)
- Knaul, F. M. (2017). Health system responses to women's cancers in the Americas: Closing divides to achieve universal health coverage. Cancer Research. *Conference: San Antonio Breast Cancer Symposium, SABCS*, 78(4 Supplement 1).
- Kotronoulas, G. (2021). Benefits, challenges, and opportunities of integrating patient-reported outcome measures in geriatric oncology to advance patient screening for functional fitness for treatment. *Seminars in Oncology Nursing*, 37(6), 151230. <https://doi.org/10.1016/j.soncn.2021.151230>
- Kotronoulas, G., Connaghan, J., Grenfell, J., Gupta, G., Smith, L., Simpson, M., & Maguire, R. (2017). Employing patient-reported outcome (PRO) measures to support newly diagnosed patients with melanoma: Feasibility and acceptability of a holistic needs assessment intervention. *European Journal of Oncology Nursing*, 31, 59-68. <https://doi.org/10.1016/j.ejon.2017.10.002>
- Kotronoulas, G., Cooper, M., & Johnston, B. (2019). Core patient-reported outcomes (PROs) and PRO measures (PROMs) for polypharmacy medicines reviews: A sequential mixed-methods study. *Patient Prefer Adherence*, 13, 2071-2087. <https://doi.org/10.2147/ppa.S236122>
- Kotronoulas, G., Maguire, R., Papadopoulou, C., Eileen, F., Patricia, F., Ream, E., . . . Nora, K. (2016). Enabling symptom self-management via use of an electronic patient-reported outcomes (ePRO) system to increase self-efficacy of patients with cancer receiving active chemotherapy treatment. *Frontiers*, 4. Retrieved from: https://www.frontiersin.org/10.3389/conf.fpubh.2016.01.00077/event_abstract
- Kotronoulas, G., Papadopoulou, C., Burns-Cunningham, K., Simpson, M., & Maguire, R. (2017). A systematic review of the supportive care needs of people living with and beyond cancer of the colon and/or rectum. *Eur J Oncol Nurs*, 29, 60-70. <https://doi.org/10.1016/j.ejon.2017.05.004>
- Li, Q., Lin, Y., Zhou, H., Xu, Y., Yang, L., & Xu, Y. (2018). Factors moderating the mutual impact of benefit finding between Chinese patients with cancer and their family caregivers: A cross-sectional study. *Psycho-Oncology*, 27(10), 2363-2373. <https://doi.org/10.1002/pon.4833>
- Lind, S., Wallin, L., Fürst, C. J., & Beck, I. (2019). The integrated palliative care outcome scale for patients with palliative care needs: Factors related to and experiences of the use in acute care settings. *Palliative and Supportive Care*, 17(5), 561-568. <https://doi.org/10.1017/S1478951518001104>
- Mahendradhata, Y., Trisnantoro, L., Listyadewi, S., Soewondo, P., Marthias, T., Harimurti, P., & Prawira, J. (2017). The Republic of Indonesia health system review. *Health Systems in Transition*, 7(1). Retrieved from <https://apps.who.int/iris/handle/10665/254716>
- Matias, M., Baciarello, G., Neji, M., Michiels, S., Partridge, A. H., Bendiane, M. K., . . . Luis, I. M. V. D. (2017). Fatigue and health behaviors in cancer survivors: A cross-sectional population based study. *Journal of Clinical Oncology*, 35(15_suppl), 10069-10069. https://doi.org/10.1200/JCO.2017.35.15_suppl.10069
- McCormack, B. (2020). The person-centred nursing and person-centred practice frameworks: From conceptual development to programmatic impact. *Nursing Standard*, 35(10), 86-89. <https://doi.org/10.7748/ns.35.10.86.s40>
- McCormack, B., & McCance, T. (2017). Person-centred practice in nursing and health care: Theory and practice: John Wiley & sons, Ltd.
- Ministry of Health of the Republic of Indonesia. (2019). Indonesia Health Profile. Retrieved from <https://kemkes.go.id/eng/profil-kesehatan-indonesia-2019>
- Ministry of Health of the Republic of Indonesia. (2023). Indonesia health survey 2023. Jakarta: Ministry of Health of the Republic of Indonesia.
- Munoz, A. R., Salsman, J. M., Stein, K. D., & Cella, D. (2015). Reference values of the functional assessment of chronic illness therapy-spiritual well-being: A report from the American Cancer Society's studies of cancer survivors. *Cancer*, 121(11), 1838-1844. <https://doi.org/10.1002/cncr.29286>
- Nasution, L. A., & Afiyanti, Y. (2024). Self-care among breast cancer survivors: A concept analysis. *Jurnal Keperawatan Padjadjaran*, 12 (2), 12. <https://doi.org/10.24198/jkp.v12i2.2504>
- Neeman, E., Gresham, G., Ovasapians, N., Hendifar, A., Tuli, R., Figlin, R., & Shinde, A. (2019). Comparing physician and nurse eastern cooperative oncology group performance status (ECOG-PS) ratings as predictors of clinical outcomes in patients with cancer. *Oncologist*, 24(12), e1460-e1466. <https://doi.org/10.1634/theoncologist.2018-0882>
- Newcomb, R. A., Nipp, R. D., Waldman, L. P., Greer, J. A., Lage, D. E., Hochberg, E. P., . . . El-Jawahri, A. R. (2020). Symptom burden in patients with cancer who are experiencing unplanned hospitalization. *Cancer*, 126(12), 2924-2933. <https://doi.org/10.1002/cncr.32833>
- Nguyen, T. Q., Do, T. M., & Pham, T. A. (2021).

- Screening for psychological distress in vietnamese cancer patients: An evaluation of the distress thermometer. *Cancer Medicine*, 10(21), 7793-7803. <https://doi.org/10.1002/cam4.4298>
- Nipp, R. D., El-Jawahri, A., Moran, S. M., D'Arpino, S. M., Johnson, P. C., Lage, D. E., . . . Temel, J. S. (2017). The relationship between physical and psychological symptoms and health care utilization in hospitalized patients with advanced cancer. *Cancer*, 123(23), 4720-4727. <https://doi.org/10.1002/cncr.30912>
- Piderman, K. M., Radecki Breitkopf, C., Jenkins, S. M., Lapid, M. I., Kwete, G. M., Sytsma, T. T., . . . Jatoi, A. (2017). The impact of a spiritual legacy intervention in patients with brain cancers and other neurologic illnesses and their support persons. *Psycho-Oncology*, 26(3), 346-353. <https://doi.org/10.1002/pon.4031>
- Pirri, C., Bayliss, E., Trotter, J., Olver, I. N., Katris, P., Drummond, P., & Bennett, R. (2013). Nausea still the poor relation in antiemetic therapy? The impact on cancer patients' quality of life and psychological adjustment of nausea, vomiting and appetite loss, individually and concurrently as part of a symptom cluster. *Supportive Care in Cancer*, 21, 735-748. <https://doi.org/10.1007/s00520-012-1574-9>
- Pitman, A., Suleman, S., Hyde, N., & Hodgkiss, A. (2018). Depression and anxiety in patients with cancer. *BMJ*, 361, k1415. <https://doi.org/10.1136/bmj.k1415>
- Poort, H., Kaal, S. E. J., Knoop, H., Jansen, R., Prins, J. B., Manten-Horst, E., & Servaes, P. (2017). Prevalence and impact of severe fatigue in adolescent and young adult cancer patients in comparison with population-based controls. *Supportive Care in Cancer*, 25, 2911-2918. <https://doi.org/10.1007/s00520-017-3746-0>
- Purba, C., Johnston, B., & Kotronoulas, G. (2022). An exploration of family caregivers' health care needs when caring for patients with cancer in the resource-challenged context of West Java, Indonesia. *Seminars in Oncology Nursing*, 39(3), 151369. <https://doi.org/10.1016/j.soncn.2022.151369>
- Purba, C., Johnston, B., & Kotronoulas, G. (2025). Developing a nurse-led palliative care intervention for adults with cancer and their family caregivers in the resource-challenged context of Indonesia. University of Glasgow, Glasgow. Retrieved from [https://theses.gla.ac.uk/id/eprint/85010/Developing \(glathesis:2025-85010\)](https://theses.gla.ac.uk/id/eprint/85010/Developing%20glathesis:2025-85010)
- Ross, L., & Austin, J. (2015). Spiritual needs and spiritual support preferences of people with end-stage heart failure and their carers: implications for nurse managers. *Journal of Nursing Management*, 23(1), 87-95. <https://doi.org/10.1111/jonm.12087>
- Sakurai, H., Miyashita, M., Morita, T., Naito, A. S., Miyamoto, S., Otani, H., . . . Matsushima, E. (2021). Comparison between patient-reported and clinician-reported outcomes: Validation of the Japanese version of the integrated palliative care outcome scale for staff. *Palliative and Supportive Care*, 1-7. <https://doi.org/10.1017/S1478951521000018>
- Scheffold, K., Philipp, R., Koranyi, S., Engelmann, D., Schulz-Kindermann, F., Härter, M., & Mehnert, A. (2018). Insecure attachment predicts depression and death anxiety in advanced cancer patients. *Palliative and Supportive Care*, 16(3), 308-316. <https://doi.org/10.1017/S1478951517000281>
- Schröder-Butterfill, E., & Fithry, T. S. (2014). Care dependence in old age: preferences, practices and implications in two Indonesian communities. *Ageing and Society*, 34(3), 361-387. <https://doi.org/10.1017/S0144686X12001006>
- Schröders, J., Wall, S., Hakimi, M., Dewi, F. S. T., Weinehall, L., Nichter, M., . . . Ng, N. (2017). How is Indonesia coping with its epidemic of chronic noncommunicable diseases? A systematic review with meta-analysis. *PLoS One*, 12(6), e0179186. <https://doi.org/10.1371/journal.pone.0179186>
- Setiabudy, R., Irawan, C., & Sudoyo, A. (2015). Opioid use in cancer pain management in Indonesia: A call for attention. *Acta medica Indonesiana*, 47(3), 244-250. Retrieved from <http://www.actamedindones.org/index.php/ijim/article/view/39>
- Silvoniemi, M., Vasankari, T., Vahlberg, T., Vuorinen, E., Clemens, K. E., & Salminen, E. (2012). Physicians' self-assessment of cancer pain treatment skills--more training required. *Support Care Cancer*, 20(11), 2747-2753. <https://doi.org/10.1007/s00520-012-1396-9>
- Subandi, M., Praptomojati, A., Marchira, C. R., DeVecchio Good, M.-J., & Good, B. J. (2021). Cultural explanations of psychotic illness and care-seeking of family caregivers in Java, Indonesia. *Transcultural Psychiatry*, 58(1), 3-13. <https://doi.org/10.1177/1363461520916290>
- Taherdoost, H. (2017). Determining sample size; How to calculate survey sample size. *International Journal of Economics and Management Systems*, 2. Retrieved from <http://www.iiar.org/iiar/journals/ijems>
- Testoni, I., Sansonetto, G., Ronconi, L., Rodelli, M., Baracco, G., & Grassi, L. (2018). Meaning of life, representation of death, and their association with psychological distress. *Palliative and Supportive Care*, 16(5), 511-519. <https://doi.org/10.1017/S1478951517000669>
- Tong, H., Zhu, Y., & Liu, Y. (2019). Incidence and risk of fatigue in cancer patients treated with MET inhibitors. *Medicine*, e15522, 98. <https://doi.org/10.1097/MD.00000000000015522>
- Tractenberg, R. E., Garver, A., Ljungberg, I. H., Schladen, M. M., & Groah, S. L. (2017). Maintaining primacy of the patient perspective

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- in the development of patient-centered patient reported outcomes. *PLOS ONE*, 12(3), e0171114. <https://doi.org/10.1371/journal.pone.0171114>
- Wessner, P. B. (2018). Last chance to care: An autoethnography of end-of-life care in Indonesia. *The Qualitative Report*, 23(9), 12. <https://doi.org/10.1111/jep.12725>
- Winarti, E., Prasetyanti, D., K., A. M., & Said, R. M. (2021). Determining behavior to uptake and its predictors toward cervical cancer screening among women: A case-control multistage study. *Jurnal Keperawatan Padjadjaran*, 9(3), 9. <https://doi.org/10.24198/jkp.v9i3.1691>
- Yennu, S., Balachandran, D., Pedraza, S. L., Berg, E. A., Chisholm, G. B., Reddy, A. S., . . . Bruera, E. (2014). Frequency and characteristics of cancer-related drowsiness (CRD or excessive daytime sleepiness) in patients with advanced cancer: Results of a prospective survey at a tertiary cancer center. *Journal of Clinical Oncology*, 32(31_suppl), 131-131. https://doi.org/10.1200/jco.2014.32.31_suppl.131
- Zou, Y., Wang, L., Zheng, D., Li, H., Sun, R., & Zhang, Z. (2024). Exploration of undergraduate nursing students' perspectives on conducting specialized nursing education during internship: A phenomenological research study. *Nurse education in practice*, 80, 104103. <https://doi.org/10.1016/j.nepr.2024.104103>

Mother empowerment in reducing the risk of stunting: An integrative review

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Abstract

Background: Stunting is a global chronic nutritional problem, with mothers playing a crucial role in its prevention. Mother empowerment is essential in reducing the risk and prevalence of stunting.

Purpose: This study aimed to identify and synthesize qualitative and quantitative research evidence on empowerment mothers to improving children's nutritional status and reducing the risk of stunting.

Methods: This research employed an integrative review method, and it was registered with the International Prospective Register of Systematic Reviews as a research-implementation protocol (ID number CRD 42023415771). Eight databases were searched for relevant literature, including Embase, PubMed, ScienceDirect, Scopus, ProQuest, JSTOR, Taylor & Francis, and Google Scholar. The evaluation of articles quality used the 2018 version of the Mixed Methods Appraisal Tool. While content analysis was employed for data analysis.

Results: The result indicated that 53 articles fulfilled the inclusion requirement, out of the 54,987 articles found during the search phase. The analysis resulted in the discovery six themes: Indicators of empowerment, factor influencing empowerment, instrument for measuring empowerment, intervention to improve maternal empowerment, impact of intervention base on empowerment indicators and Stunting interventions across countries. These themes collectively form a conceptual model of mother empowerment to reduce the risk of stunting in children. It can be concluded that mother empowerment, by considering various indicators, can increase mothers' active participation in reducing the risk of stunting in children.

Conclusion: That mother empowerment, by considering various indicators, can increase mothers' active participation in reducing the risk of stunting in children. Integrating empowerment-based interventions into maternal and child health programs is recommended to improve nutritional outcomes and reduce the prevalence of stunting.

Keywords: childcare; integrative review; mother's empowerment; nutrition; stunting

Introduction

Stunting is a chronic condition of impaired growth resulting from long-term malnutrition, representing a failure of growth and development that begins in early life. It is characterized by a length-for-age (LAZ) or height-for-age (HAZ) index below -2 standard deviations (SD) (Ministry of Health Republic of Indonesia, 2018a; World Health Organization, 2018). Stunting is defined as a chronic form of undernutrition during the growth and developmental period, caused by prolonged nutritional deficiencies starting from pregnancy through the first 24 months of life (the first 1,000 days) (Ministry of Health Republic of Indonesia, 2018a).

Stunting is one of the most prevalent nutritional problems worldwide. It contributes to approximately 14% of under-five mortality and remains a major

public health concern, particularly in developing countries. Stunting is associated with increased risks of morbidity and mortality (Simanjuntak, 2018), also leads to suboptimal brain development, which hampers motor and cognitive growth. In Indonesia, stunting is one of the five priority health issues with long-term implications for both individuals and society, including reduced cognitive and physical development, decreased productivity, poor health outcomes, and an elevated risk of degenerative diseases.

Multiple factors contribute to stunting, encompassing both internal and external determinants. Internal factors directly related to infant and child growth include parenting practices, exclusive breastfeeding, complementary feeding, complete immunization, dietary patterns, infection, and genetic predisposition. External factors include family socioeconomic status, maternal education, employment, and household income (Beal et al., 2018). Additional causes include maternal and child undernutrition, limited maternal knowledge about health and nutrition before and during pregnancy and childbirth, inadequate healthcare services such as antenatal care (ANC) and postnatal care, lack of access to quality early childhood education, and insufficient availability of nutritious foods.

The process of stunting develops gradually and requires multisectoral involvement for effective prevention and management. Ensuring adequate nutrition during the first 1,000 days of life is crucial, alongside addressing behavioral factors such as inadequate feeding practices among parents (Terfa et al., 2022a). Both nutrition-specific and nutrition-sensitive interventions are essential in tackling stunting. Nutrition-sensitive interventions, in particular, require cross-sectoral collaboration. These combined efforts aim to accelerate the reduction of stunting (Ministry of Health Republic of Indonesia, 2018a).

The primary focus in reducing stunting prevalence is prevention, which necessitates parental involvement in monitoring their children's growth and ensuring adequate nutritional intake from an early age. Prevention and care should be family-centred, with a particular emphasis on empowering parents and caregivers. Parents, especially mothers, are the closest caregivers and have the most comprehensive understanding of their children's health status. Therefore, empowering families—especially mothers—becomes a key strategy in improving child health outcomes (Komakech et al., 2022).

Parental empowerment is a process in which parents enhance and exercise their capacity to make decisions and take actions that influence their children's health (Ashcraft et al., 2019). Empowerment enables parents to engage actively in daily care, participate in healthcare decisions, manage their children's symptoms, advocate for their children and families, and contribute to collective empowerment initiatives (Ashcraft et al., 2019).

By empowering parents to identify problems, plan, and make appropriate decisions independently, preventive behaviors against stunting can be strengthened.

Although numerous studies have examined the determinants of stunting and evaluated the effectiveness of nutrition-specific and nutrition-sensitive interventions, relatively few have focused on the role of parental empowerment as a preventive strategy. Most existing interventions emphasise biomedical and nutritional aspects (Bonilla et al., 2017; Chou et al., 2018; Dibley et al., 2020).

At the same time, the psychosocial dimension—particularly the capacity of parents to make informed decisions, manage childcare practices, and advocate for health resources—remains underexplored. Furthermore, evidence on how parental empowerment can be systematically integrated into community-based and family-centred stunting prevention programs remains limited, especially in low- and middle-income countries such as Indonesia. This gap underscores the need for systematic reviews that consolidate current evidence on parental empowerment in stunting prevention, informing policy and practice. The ultimate goal of stunting prevention efforts is to establish empowered parental practices. Accordingly, this study aimed to identify and synthesize qualitative and quantitative research evidence on empowerment mothers to improving children's nutritional status and reducing the risk of stunting.

Materials and Methods

Design

This research adopts an integrative review approach following the framework proposed by Dhollande et al. (Dhollande et al., 2021). The implementation of this integrative review involved a systematic encompassing seven stages (Table 1). The review focused on mothers' empowerment in preventing stunting. This Integrative Review Research Protocol has been registered with The International Prospective Register of Systematic Reviews (PROSPERO) on April 17, 2023, and has gone through the review process and registered with registration ID number CRD 42023415771 on April 28, 2023.

Article Search Strategy

A systematic search was conducted across eight electronic databases: Embase, PubMed, ScienceDirect, Scopus, ProQuest, JSTOR, Taylor & Francis, and Google Scholar. The study used a multi-database approach to ensure a comprehensive and unbiased review process. These databases cover a wide range of health topics relevant to the research topic (Mendoza Vela, 2025; Nick & Sarpy, 2022). The search strategy was developed using the PICO framework, defined as follows:

Articles were included if they met the following criteria: (1) published within the last 10 years, (2)

peer-reviewed journal articles, (3) original research (quantitative, qualitative, or mixed-methods), (4) studies addressing parental, maternal, or family empowerment in relation to stunting prevention, child nutrition, or child health outcomes. Exclusion criteria were (1) non-research articles (e.g., reviews, commentaries, editorials), (2) publications in languages other than English, and (3) studies without accessible full text.

The literature search employed the PICO framework in conjunction with Medical Subject Headings (MeSH) terms to ensure comprehensive retrieval of relevant studies. Boolean operators (AND, OR) were applied as follows: (“*stunting*”) AND (“*mother empowerment*” OR “*parent empowerment*” OR “*women empowerment*”) AND (“*knowledge*” AND “*self-efficacy*” AND “*competency*” AND “*nutritional status*”). The search was restricted to publications from the past decade.

The initial search identified 54,987 records: 62 from Embase, 88 from PubMed, 42,882 from ScienceDirect, 42 from Scopus, 505 from ProQuest, 586 from JSTOR, 22 from Taylor & Francis, and 19,800 from Google Scholar. After applying restrictions, 705 records remained. Titles and abstracts were screened, yielding 170 potentially relevant studies. Full-text screening identified 72 eligible studies. Following the removal of six duplicates and exclusion of 12 articles not meeting the criteria, 53 studies were included in the final review. The selection process is summarized in [Figure 1](#). Screening and eligibility assessment were conducted independently by two reviewers to minimize selection bias.

Inclusion and exclusion criteria

[Table 3](#) presents the inclusion and exclusion criteria in detail.

Data extraction

Data were extracted using a structured form in Microsoft Excel, which included study characteristics (author, year, country, study design, and sample size), type of intervention, empowerment components, and key outcomes ([Table 5](#)). EndNote software was used to manage references and remove duplicates.

Study Quality Assessment

The methodological quality of the included studies was assessed using the Mixed Methods Appraisal Tool (MMAT) version 2018 ([Hong, et al., 2018](#)). Two reviewers independently appraised each study, and disagreements were resolved through discussion with a third reviewer. The reviewer has relevant experience related to Child Health, has conducted extensive research using a systematic review approach and assessed that MMAT has a comprehensive coverage of various study designs, including qualitative, quantitative, and mixed methods and is in accordance with the integrative systematic review conducted ([Hong et al., 2018](#)). The checklist was carefully adapted to the specific research designs of the included studies, which comprised qualitative research, quantitative randomized controlled trials, quantitative non-randomized studies, quantitative descriptive studies, and mixed-methods studies. For each category of study design, all relevant appraisal items were systematically evaluated. The quality assessment procedure using MMAT 2018 commenced with the

Table 1. Stages an Integrative Review (Dhollande et al., 2021)

Stage	Description
1	Write the review question
2	Determine the search strategy
3	Critical appraisal of the search results
4	Summarise the search results
5	Data extraction and reduction
6	Analysis
7	Conclusions and implications

Table 2. PICO Framework

Population (P)	Children with stunting or at risk of stunting.
Intervention (I)	Mother empowerment, parent empowerment, or women empowerment programs/interventions aimed at improving child nutrition and care
Comparison (C)	Standard care, no intervention, or other non-empowerment-based interventions.
Outcome (O)	Improvements in: Knowledge of mothers/parents about nutrition and child care Self-efficacy in practicing nutrition-related behaviors Competency in caregiving practices Nutritional status of the child (e.g., reduction in stunting rates, improved growth indicators)

Table 3. Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Publication year	Articles published within the last 10 years	Articles published more than 10 years ago
Type of source	Peer-reviewed journal articles	Reviews, commentaries, editorials, conference abstracts, theses/dissertations
Study design	Original research (quantitative, qualitative, or mixed-methods)	Non-research articles, opinion papers, and case reports with no relevance
Language	English	Non-English publications
Population	Studies on stunting prevention in children under five years	Studies not related to stunting or unrelated health issues
Intervention	Parental, maternal, or family empowerment programs/approaches	Interventions unrelated to empowerment
Outcomes	Knowledge, self-efficacy, competency, and/or nutritional status of children	Outcomes not related to stunting prevention or parental empowerment.
Accessibility	Full-text articles available	Articles with inaccessible full text

identification of two preliminary screening questions: first, whether the research question was stated with sufficient clarity, and second, whether the data presented were adequate to address and support the research question. Only when both screening criteria were satisfactorily met did the assessment proceed to the subsequent stage, in which the appraisal was conducted in accordance with the methodological characteristics of the respective study design. This structured and rigorous approach ensured that the evaluation of study quality was not only consistent across different types of research but also contextually aligned with the methodological diversity represented in the included articles.

The studies represented a wide range of designs, including qualitative studies ($n = 3$), randomised controlled trials (RCTs, $n = 10$), non-randomised quantitative studies ($n=37$), descriptive quantitative studies ($n = 1$), and mixed-methods studies ($n = 2$). All studies met the two MMAT screening criteria: (1) research questions were clearly stated, and (2) data presented adequately addressed the research questions. A detailed appraisal revealed that the majority of quantitative non-randomized studies ($n=37$) adequately addressed issues of sample representativeness, outcome measurement, and confounding variables. All RCTs ($n = 10$) demonstrated appropriate randomization, comparability of groups at baseline, and adherence to intervention protocols. The qualitative and mixed-methods studies displayed coherence across research design, data collection, analysis, and interpretation. Table 5 provides a comprehensive detail of the quality appraisal for each included study.

Data Extraction and Data Analysis

Given the heterogeneity of study designs and outcomes, a narrative synthesis was employed. Findings were grouped thematically to capture key aspects of parental empowerment and its influence on knowledge, self-efficacy, competency, and child nutritional status. In the article selection, in the

initial search stage, the researcher obtained 54,987 articles using eight databases. The databases produced 62 articles each from Embase, 88 from PubMed, 42,882 articles from Science Direct, 42 from Scopus, 505 from Pro Quest, 586 from JSTOR, 22 from Taylor and Francis and 19,800 from Google Scholar. In the next stage after obtaining articles according to keywords, researchers carry out restrictions or limitations using the criteria of articles published in the last ten years, source types in the form of journals and documents in the form of research articles, articles obtained 705 articles. Researchers made the initial selection by reading the title and abstract of each article obtained, resulting in 170 articles.

Further selection was carried out by viewing and reading the full text of each article that met the inclusion criteria, totaling 72 articles. Of the articles that have been analyzed, seven duplicate articles are included in the review list, and 12 articles need to meet the predetermined inclusion criteria. So, at the end of the analysis, 53 articles will be included in the review stage. The process of article selection is summarized in Figure 1.

The retrieval of information related to the study was carried out using an extraction form, namely: (1) Study identification: first author, title, year of publication; (2) Study characteristics: country, design; (3) Population characteristics, sample and (4) Characteristics of maternal empowerment factors, interventions used: types of interventions, instruments used in conducting maternal empowerment studies. Each submitted article was compiled in Excel format, and notes were written regarding the characteristics of the intervention implemented and maternal empowerment factors. The next step is to categorize the interventions into 2 main categories: interventions to increase maternal empowerment and the impact of interventions on maternal empowerment indicators, namely knowledge, self-efficacy, skills and child nutritional status.

Table 4. Quality Assessment using the Mixed Methods Appraisal Tool (MMAT) version 2018 (Hong et al., 2018)

Author	Was the qualitative approach appropriate to answer the research question?	Were the qualitative data collection methods adequate to address the research question?	Were the findings derived from the data in a complete manner?	Was the interpretation of results sufficiently supported by the data?	Was there coherence between data sources, collection, analysis, and interpretation?
(Athavale et al., 2020)	Yes	Yes	Yes	Yes	Yes
(Wood et al., 2021)	Yes	Yes	Yes	Yes	Yes
(Tome et al., 2021)	Yes	Yes	Yes	Yes	Yes
Author	Was randomization appropriately performed?	Were the groups comparable at baseline?	Was there complete outcome data?	Were outcome assessors blinded to the intervention?	Did participants adhere to the assigned intervention?
(Tome et al., 2021)	Yes	Yes	Yes	Yes	Yes
(Heckert et al., 2019)	Yes	Yes	Yes	Yes	Yes
(Gelli et al., 2017)	Yes	Yes	Yes	Yes	Yes
(Azupogo, et al., 2020)	Yes	Yes	Yes	Yes	Yes
(Matara et al., 2021)	Yes	Yes	Yes	Yes	Yes
(Santoso et al., 2021)	Yes	Yes	Yes	Yes	Yes
(Olney et al., 2015)	Yes	Yes	Yes	Yes	Yes
(Gelli et al., 2018)	Yes	Yes	Yes	Yes	Yes
(Heckert et al., 2023)	Yes	Yes	Yes	Yes	Yes
Author	Did the participants represent the target population?	Were measurements appropriate regarding outcome and intervention?	Was there complete outcome data?	Were confounders accounted for in design and analysis?	During the study period, was the intervention administered as intended?
(Yaya et al., 2020)	Yes	Yes	Yes	Yes	Yes
(Mekonnen et al., 2021)	Yes	Yes	Yes	Yes	Yes
(Sey-Sawo et al., 2023)	Yes	Yes	Yes	Yes	Yes
(Walters et al., 2019)	Yes	Yes	Yes	Yes	Yes
(Khalid & Martin, 2017)	Yes	Yes	Yes	Yes	Yes
(Khalid & Martin, 2017)	Yes	Yes	Yes	Yes	Yes
(Paul & Saha, 2022)	Yes	Yes	Yes	Yes	Yes
(Terfa et al., 2022)	No	Yes	Yes	Yes	Yes
(Poudel et al., 2022)	Yes	Yes	Yes	Yes	Yes
(Saadah et al., 2022)	Yes	Yes	Yes	Yes	Yes
(Komakech et al., 2022)	Yes	Yes	Yes	Yes	Yes
(Baxter et al., 2023)	Yes	Yes	Yes	Yes	Yes
(Tesfaye & Egata, 2022b)	Yes	Yes	Yes	Yes	Yes
(Sharma & Subramanyam, 2021)	Yes	Yes	Yes	Yes	Yes
(P. & Bansal, 2022)	Yes	Yes	Yes	Yes	Yes

Indanah, I., et al. (2026)

Cont. Table 4. Quality Assessment using the Mixed Methods Appraisal Tool (MMAT) version 2018 (Hong et al., 2018)

Author	Did the participants represent the target population?	Were measurements appropriate regarding outcome and intervention?	Was there complete outcome data?	Were confounders accounted for in design and analysis?	During the study period, was the intervention administered as intended?
(Bliznashka et al., 2021)	Yes	Yes	Yes	Yes	Yes
(McKenna et al., 2019)	Yes	Yes	Yes	Yes	Yes
(Abreha et al., 2020)	Yes	Yes	Yes	Yes	Yes
(Ickes et al., 2018)	Yes	Yes	Yes	Yes	Yes
(Egbuonye et al., 2021)	Yes	Yes	Yes	Yes	Yes
(Jisso et al., 2022)	Yes	Yes	Yes	Yes	Yes
(Besnier, 2023)	Yes	Yes	Yes	Yes	Yes
(Christian, et al., 2023)	Yes	Yes	Yes	Yes	Yes
(Imai, et al., 2014)	Yes	Yes	Yes	Yes	Yes
(Holland & Rammohan, 2019)	Yes	Yes	Yes	Yes	Yes
(Kulkarni et al., 2021)	Yes	Yes	Yes	Yes	Yes
(Kim et al., 2019)	Yes	Yes	Yes	Yes	Yes
(Malapit & Quisumbing, 2015)	Yes	Yes	Yes	Yes	Yes
(Sraboni & Quisumbing, 2018)	Yes	Yes	Yes	Yes	Yes
(Quisumbing et al., 2021a)	Yes	Yes	Yes	Yes	Yes
(Bonis-profumo et al., 2021)	Yes	Yes	Yes	Yes	Yes
(de Groot et al., 2022)	Yes	Yes	Yes	Yes	Yes
(Jones et al., 2019)	Yes	Yes	Yes	Yes	Yes
(Onah, 2021)	Yes	Yes	Yes	Yes	Yes
(Sraboni et al., 2014)	Yes	Yes	Yes	Yes	Yes
(Aziz et al., 2020)	Yes	Yes	Yes	Yes	Yes
(Tchakounté Tchuimi, 2023)	Yes	Yes	Yes	Yes	Yes
Authors	Was the sampling strategy relevant to address the research question?	Did the sample represent the target population?	Were the measurements appropriate?	Was the risk of non-response bias low?	Was the statistical analysis appropriate to answer the research question?
Ewerling et al., 2017	Yes	Yes	Yes	Yes	Yes

Cont. Table 4. Quality Assessment using the Mixed Methods Appraisal Tool (MMAT) version 2018 (Hong et al., 2018)

Authors	Was there an adequate rationale for using a mixed-methods design to address the research question?	Were the different components of the study effectively integrated to answer the research question?	Were the outputs of the integration of qualitative and quantitative components adequately addressed?	Were divergences and inconsistencies between quantitative and qualitative results adequately addressed?	Did each component of the study adhere to the quality criteria of its respective methodological tradition?
(Bonilla et al., 2017)	Yes	Yes	Yes	Yes	Yes
(Brar et al., 2020)	Yes	Yes	Yes	Yes	Yes
(Tasic et al., 2020)	Yes	Yes	Yes	Yes	Yes

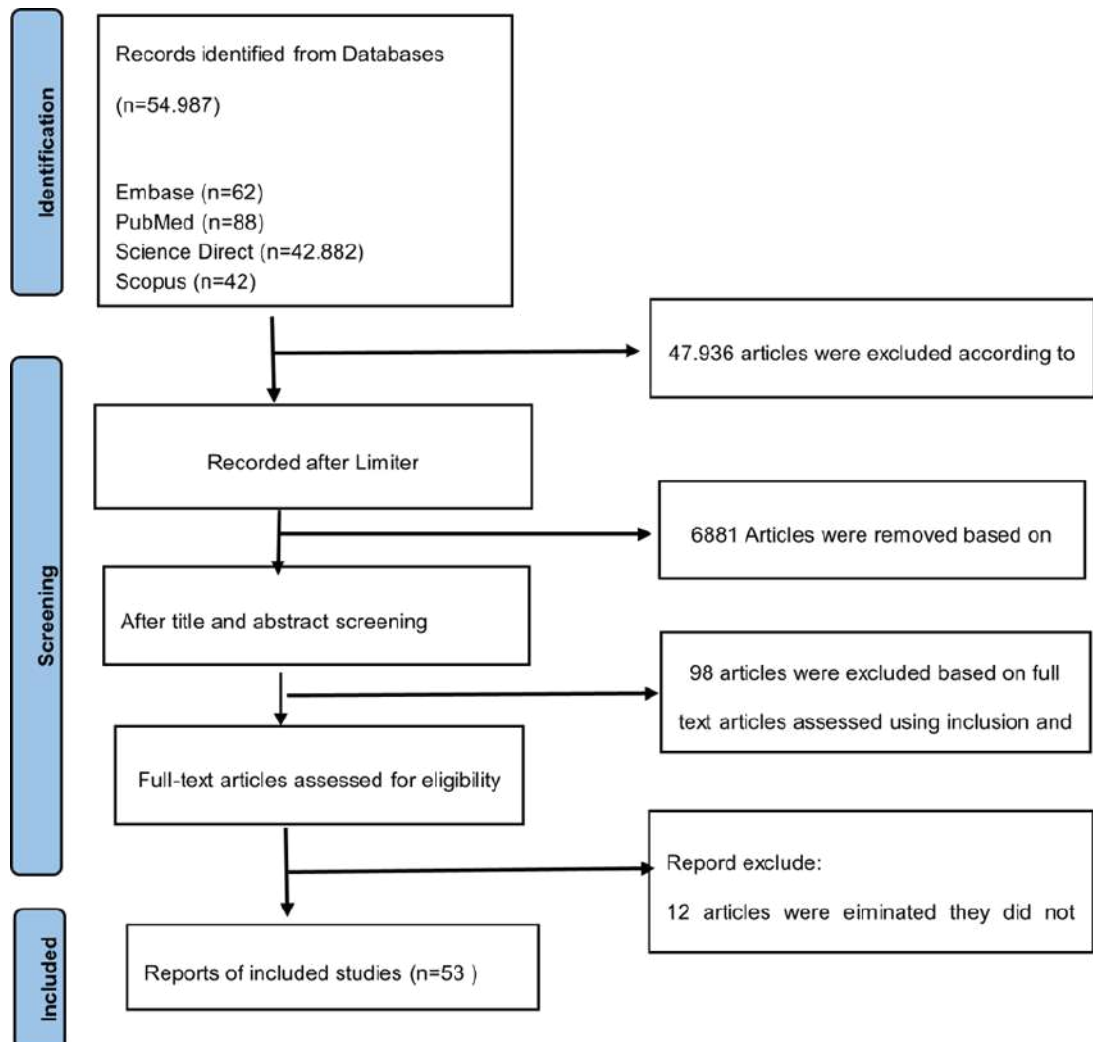


Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.

Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Yaya et al., 2020b) Canada Global Health Research and Policy, 2020,5:1 https://doi.org/10.1186/s41256-019-0129-8	To examine the relationship between women's empowerment and children's nutritional status as a predictive factor for malnutrition	Cross-sectional	Data from DHS 2011-2017 in 30 sub-Saharan African countries Women aged 15-49 years and children aged five years	Women's empowerment	Women's empowerment was measured using three indicators: household decision-making index, attitudes towards violence, and lived experiences of violence.	1. Socio-demographic characteristics of women were significantly associated with childhood nutritional status (stunting and wasting) ($p < 0.001$) as well as women's empowerment indicators (decision-making, attitudes towards violence, and experiences of violence) ($p < 0.001$), except for child age and gender. 2. The association between childhood nutritional status and women's empowerment (across all three measures) remained significant after controlling for covariates ($p < 0.001$) 3. Attitudes towards violence and experiences of violence were positively associated with children's nutritional status, while decision-making showed a negative association.
(Mekonnen et al., 2021c) Ethiopia 2021 BMC Women's Health; 2021; 21:42 https://doi.org/10.1186/s12905-021-01183-x	To identify the determining factors related to women's empowerment and growth failure among children under five years	Cross-sectional	Ethiopian Demographic and Health Survey (EDHS) 2016 data; women aged 15-49 years and children under five	Women's empowerment	Women's empowerment was assessed using the Survey-based Women's Empowerment (SWPER) Index, which includes household decision-making, attitudes towards violence, and lifetime experiences of violence.	1. Attitudes towards domestic violence, social independence (social), and women's empowerment decisions were significantly associated with stunting and underweight.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Sey-Sawo et al., 2023b) Gambia 2023 BMC Public Health: 2023;23:583 https://doi.org/10.1186/s12889-023-15494-1	To examine the relationship between women's empowerment and malnutrition among children under five years	Cross-sectional	The Gambia Demographic and Health Survey (2019–2020); 7,123 mothers aged 15–49 years and their children under five	Women's empowerment	Women's empowerment Indicator: educational status (primary and above), employment (currently working), decision making (contraceptives, earnings, large household purchases), age at first sex, age at first birth, and acceptance of wife beating	1. Several factors were significantly associated with stunting, including number of children (p=0.020), place of residence (p=0.031), household wealth index (p=0.002), maternal thinness (p=0.021), intimate partner violence (p=0.001), child's age (p=0.026), birth order (p=0.042), and partner's welfare and education (p=0.028). 2. Maternal education remained a strong predictor: women with no formal education were 51% more likely to have stunted children under five (OR = 1.51; 95% CI: 1.11–2.07; p = 0.009) compared with those who had attained primary education or higher. 3. Exposure to domestic violence further increased the risk of child stunting by 69% (OR=1.69; 95% CI: 1.22–2.35; p=0.002).
(Walters et al., 2019): Malawi 2019 BMC Public Health: 2019; 19: 1503 https://doi.org/10.1186/s12889-019-7877-8	To assess mothers' ability in breastfeeding and complementary feeding practices, and their association with stunting.	Cross-sectional	The Malawi Demographic and Health Survey (MDHS) (2015–2016), Children aged 0–23 months N: 2294	Empowerment	Empowerment indicators included land ownership, wealth index, decision-making regarding income, and decision-making regarding health.	Maternal characteristics (ethnicity, number of children, region and area of residence, maternal height, maternal BMI, type of delivery, postnatal examination, wealth index, and radio use) and five empowerment domains were significantly associated with breastfeeding and complementary feeding practices.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Nsiah-Asamoah et al., 2022) Ghana 2022 BMC Pediatric; 2022; 22:251 https://doi.org/10.1186/s12887-022-03651-1	To examine maternal factors related to Infant and Young Child Feeding (IYCF) indicators, including Minimum Acceptable Diet (MAD) and Minimum Diet Diversity (MDD), in children up to 23 months of age	Cross-sectional	Ghana Demographic and Health Survey (GDHS) (2015) Children aged 0-23 months, with a gestational age of 37-42 weeks, weighing 2500-4000 grams, without physical and metabolic problems N: 935	Maternal decision-making power and financial independence	Maternal decision-making power Indicators include healthcare, large-scale household spending, visiting relatives, and childcare. Financial independence, including the freedom to control finances to buy food, clothing, medical treatment, jewelry, and give to relatives/family	1. Maternal employment (AOR=3.07; 95% CI: 1.71–5.49; p<0.001) and secondary or higher education (AOR=2.86; 95% CI: 1.42–5.78; p=0.003) significantly increased the likelihood of children receiving minimum acceptable diet (MAD). 2. Women's empowerment, reflected in decision-making autonomy (AOR=1.68; 95% CI: 1.02–2.76; p=0.040) and financial independence (AOR=1.55; 95% CI: 1.01–2.38; p=0.045), was positively associated with dietary diversity among children. 3. Maternal secondary or higher education (AOR=0.59; 95% CI: 0.36–0.97; p=0.040) and employment (AOR=0.71; 95% CI: 0.47–1.07; p=0.043) were linked to reduced risks of stunting (HAZ) and underweight (WAZ).
(Khalid & Martin, 2017) Pakistan 2017 Maternal Child Health Journal; 2017; 21:1967-1984 https://doi.org/10.1007/s10995-017-2314-z	To examine the relationship between women's empowerment within households and the incidence of stunting in children	Cross-sectional	Ghana Demographic and Health Survey (GDHS) (2015) Mother and child 1-4 years N 8985	Female empowerment: Female-headed household	Equating women's empowerment in the household with identifying women's role as head of the family	Households with women as heads of households have a 26% lower risk of stunting (OR 0.74, 95% CI 0.60-0.90).

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Tome et al., 2021) Maternal & Child Nutrition; 2021: 17: e13122 https://doi.org/10.1111/mcn.13122	To develop an instrument for a quantitative survey on "Maternal Capability" and examine its relationship to child health status	RCT	Mothers (N = 4,025) and their babies (N = 4,073)	Sanitation Hygiene Infant Efficacy (SHINE) Program	The Sanitation Hygiene Infant Nutrition Efficacy (SHINE), with the forms of intervention: 1. Standard of Care (SOC) + health promotion from the Government Maternal Health Services, IMD, ASI up to 6 months 2. WASH (SOC provides toilets, hand washing facilities, soap, chlorine, drinking water, and play areas 3. IYCF (all SOC + 20 g daily toap for fat consumption of children aged 6 to 18 months, MPASI 4. WASH+IYCF Maternal capability during pregnancy indicators: physical, mental, decision-making autonomy, social support, mothering self-efficacy (self-confidence in her role as a competent mother), workload, time stress and gender norm attitudes	1. Higher gender norm attitude scores, reflecting more equitable views, were associated with improved LAZ (+0.09; 95% CI: 0.02–0.16) and a reduced odds of stunting (AOR = 0.86; 95% CI: 0.74–1.01). 2. Greater social support was associated with higher LAZ (+0.11; 95% CI: 0.05–0.17; p = 0.010) and lower odds of stunting (AOR = 0.83; 95% CI: 0.73–0.96). 3. Each unit increase in decision-making autonomy reduced the probability of stunting by 6% (AOR = 0.94; 95% CI: 0.89–0.996; p = 0.04). 4. Maternal self-efficacy was positively associated with birth weight but not with child LAZ at 18 months.
(Paul & Saha, 2022) India; 2022 PLOS ONE, 17(5):e0268126 https://doi.org/10.1371/journal.pone.0268126	To examine the relationship between women's autonomy and the nutritional status of children under five years	Cross-sectional	National Family Health Survey 2015–2016; mothers and children (N = 38,685)	Maternal Autonomy/ empowerment	Maternal Autonomy/ empowerment: measured by indicators household decision-making, freedom of physical movement, and access to economic resources/ control over assets	1. Mothers with more autonomy significantly reduce the likelihood of their children experiencing malnutrition. 2. Maternal autonomy was significantly associated with stunting [OR: 0.93; 95% confidence interval (CI): 0.87, 1.00] and wasting (OR: 0.92; 95% CI: 0.85, 1.00) after controlling for confounding variables.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Terfa et al., 2022); Uganda; 2022 International Journal of Environmental Research and Public Health https://doi.org/10.3390/ijerph19116684	To examine the relationship between nursing care in the household microenvironment and the incidence of acute respiratory infection (ARI), diarrhea, and stunting in children under five years	Cross-sectional	Uganda Demographic and Health Survey (UDHS) 2016; women and children under five	Women empowerment	Women's empowerment with indicators: Free from violence, free to determine social decision-making	1. Independent women were associated with lower risk of ARI (OR = 0.91, 95% CI 0.84 to 0.98), diarrhea (OR = 0.93, 95% CI 0.88 to 0.99), and stunting (OR = 0.83, 95% CI 0.75 to 0.92). 2. Women's attitudes towards domestic violence were associated with recurrence of ARI (OR = 0.88, 95% CI 0.82 to 0.93) and diarrhea (OR = 0.89, 95% CI 0.84 to 0.93). 3. Access to sanitation facilities was associated with a lower risk of ARI (OR = 0.55, 95% CI 0.45 to 0.68), diarrhea (OR = 0.83, 95% CI 0.71 to 0.96), and stunting (OR = 0.64, 95% CI 0.49 to 0.86).
(Poudel et al., 2022); Nepal; 2022; Frontiers in Public Health Vol 10:817717 https://doi.org/10.3389/fpubh.2022.817717	To examine the relationship between women's empowerment and children's nutritional status	Cross-sectional	300 mothers with children aged 6–59 months in Nepal	Women's empowerment	Women's Empowerment Index Five indicators 1. Decision-making; 2. Involvement in communities/groups 3. Independent in income; 4. Home/land ownership; 5. Education Status Maternal Empowerment Index 7 Dimensions: 1. Health Decision Making 2. Household spending decision-making; 3. Freedom to visit relations; 4. Become a member of a community group; 5. Generate your income; 6. Home/land ownership; 7. Educational status Empowerment Level: Low, Moderate, and High;	1. Of the 300 mothers with children aged 6-59 months, 49% were very empowered, while around 38% had poor nutritional status. 2. 26.7% of children experienced stunting, 7% were wasted, 17.7% were underweight, and overall, 38% were malnourished. Mothers with low empowerment status will increase the incidence of wasting 5x, the possibility of stunting 30x, and the risk of underweight in children 29x.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Heckert et al., 2019); Burkina Faso; 2019; Social Science & Medicine 233 (2019) 93-102 https://doi.org/10.1016/j.socscimed.2019.05.016	To examine the relationship between women's empowerment and children's nutritional status	RCT	Mothers and children aged 3-12 months (1058), consisting of Age 3-5 months (404) and 6-12 months (654) Total sample 1035 intervention (610) control (425)	Helen Keller International Program	Helen Keller International Program; E-HFP (The Enhanced Homestead Food Production), a nutrition and gender-sensitive agriculture program: 1. Agriculture Training and Input; 2. Behavior Change Communication (BCC) Programs; agriculture activities and optimal infant and young child feeding (IYCF), health, hygiene, care, and nutrition practices; 3. Community-focused activities; Women Empowerment Indicators (5): spousal communication, purchasing decisions, health care decisions, family planning decisions, and Infant and Young Child Feeding /IYCF	The E-HFP program, through women's empowerment, can reduce the prevalence of wasting,
(Saadah et al., 2022) Indonesia Macedonian Journal of Medical Sciences 2022 Mar 09; 10(G):649-655 https://doi.org/10.3889/oamjms.2022.8759	To develop a maternal empowerment model for stunting prevention through early detection training	Quasi-experiment	Mothers aged 20-45 years with toddler-aged children N:150	Mother empowerment	Mother empowerment: Using a questionnaire measuring tool. The indicators measured included maternal knowledge, family support, nutritional status, maternal commitment, the child's physical health, and the environment both outside and within the home.	1. The primary factors influencing stunting intervention were maternal commitment (commitment to the action plan), followed by maternal characteristics (personal factors) and family support (interpersonal influences).; 2. Mothers with favourable personal characteristics demonstrated a significant increase in knowledge, as measured by a 0.423 increase (p = 0.000).; 3. Higher maternal knowledge was associated with a 0.230 increase in maternal commitment (p = 0.004).; 4. Mothers exhibiting strong commitment contributed to a reduction in child stunting by 0.448 (p = 0.000).; 5. Increased maternal knowledge also enhanced family support by 0.236 (p = 0.040). 6. Greater family support was associated with a 0.257 reduction in stunting (p = 0.011).

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Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Komakech et al., 2022) ¹ Africa; 2021; Maternal & Child Nutrition; 2022; 18: e13421; https://doi.org/10.1111/mon.13421	To examine the relationship between women's empowerment and children's nutritional status	Cross-sectional	Demographic and Health Survey (DHS) data of Burundi 2016-2017, Ethiopia 2016, Kenya 2014, Malawi 2015-2016, Rwanda 2014-2015, Tanzania 2015-2016, and Uganda 2016 Sample: mothers (15-49 years) and children (6-23 months)	Women empowerment	Women's empowerment measures: Physical factors (economic empowerment, legal empowerment) Environmental Factor (Self-esteem empowerment) Development Factor (Decision autonomy, Health decision control empowerment)	1. Globally, 32%–59% of children experience developmental failure.; 2. Only 18%–45% of children achieve Minimum Diet Diversity (MDD).; 3. Women's self-confidence was associated with a lower likelihood of stunting, wasting, underweight, and overall growth failure (AOR = 0.62 in Rwanda, 0.38 in Uganda, 0.60 in Tanzania, and 0.57 in Uganda).;4. In Burundi, women's influence over health-related decisions was associated with a lower risk of stunting and child developmental failure, and an increased likelihood of meeting MDD (AOR = 2.50).;5. Legal empowerment among women was associated with higher likelihoods of stunting (AOR = 1.79 in Burundi), underweight (AOR = 1.77 in Uganda), and overall growth failure (AOR = 1.87 in Burundi).
(Baxter et al., 2023): Pakistan, 2023, BMJ Open 2023; 13:e063734 https://doi.org/10.1136/bmjopen-2022-063734	To identify the determinants of malnutrition in late adolescence and young adulthood in Pakistan	Cross-sectional	25447 Late adolescent and young adult women since June 2017-July 2018	Material Power and Preconception Supplementation Trial (MaPPS)	1. The Maternal Power and Preconception Supplementation (MaPPS) trial was a cluster-randomised intervention in rural Pakistan that assessed the effects of skills development, multiple micronutrient supplementation, health, and empowerment on women.;2. Empowerment was measured through self-efficacy (Generalized Self-Efficacy Scale) and decision-making autonomy (Pakistan Demographic and Health Survey), covering personal food consumption, health-care, household purchases, and intra-household food distribution.; 3. Decision-making was classified using the Women's Empowerment Index (WEI) into four levels: all decisions made by the family, most decisions made by the family, joint decisions	Adolescents who experience stunting tend to have lower self-efficacy and decision-making abilities compared to their peers who do not experience stunting.

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Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Athavale et al., 2020); India; 2020 Journal of Health, Population and Nutrition (2020) 39:7 https://doi.org/10.1186/s41043-020-00215-w	To assess barriers and facilitators affecting caregivers' implementation of recommended infant and toddler feeding practices in two urban communities in Mumbai, within a nutrition education-based intervention	Qualitative	Families with children are categorized into 3 age groups 6-12 months (n: 9); 13-18 months (n: 9), 19-24 months (n:9) N Total: 27	Self-efficacy; empowerment family support.	Self-efficacy, empowerment, and family support	1. Barriers to implementing IYCF practices included limited knowledge and experience, exposure to conflicting information from multiple sources, inadequate social support, and low maternal self-efficacy in decision-making. 2. Recommended facilitators for IYCF practices encompassed the provision of professional nutritional guidance, enhancement of maternal self-efficacy and empowerment, and strengthened family support.
(Wood et al., 2021); 2021; Tajikistan; BMC Women's Health 2021; 2:91 https://doi.org/10.1186/s12905-021-01227-2	To explore perceptions of Tajik men and women regarding gender-based violence (GBV) and to understand gender norms in Tajik society	Qualitative	234 participants (men and women aged 18–46 years) from 12 villages in Khatlon Province	Women empowerment	Women's Empowerment: This participation is important for gathering their perceptions about women's empowerment, gender, violence, and decision-making. Semi-structured interview Indicators of Women empowerment: Education, employment, decision making, marital status, Good relationship and mutual respect, Violence, Mental Health, Forms of Violence	Significant differences were observed between men's and women's perceptions of societal gender norms.

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Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Gelli et al., 2017b), Burkina Faso, 2017, BiomedCentral 2017; 18:814 https://doi.org/10.1186/s13063-017-2156-4	To evaluate the impact of the SELEVER agricultural and nutrition intervention package, including Behavior ChangeCommunication, strengthening poultry value chain services, and sensitivity to women's empowerment	RCT	Women aged 15–35 years with at least one child aged 0–5 years	Selever Activity: Women's empowerment	The Women's Empowerment in Agriculture Index (WEAI) measures empowerment across multiple domains, including decision-making in agricultural production, access to and control over productive resources, access to financial resources, leadership roles within the community, and allocation of time.	The intervention led to improvements in women's empowerment, particularly in decision-making and time allocation, and contributed to positive changes in women's overall well-being.
(Tesfaye & Egata, 2022), Ethiopia, 2022, Journal of Health Population and Nutrition 2022; 41: 13 https://doi.org/10.1186/s41043-022-00291-0	To evaluate the prevalence and factors associated with stunting in children aged 6–59 months in Cheleko District, East Hararge Zone, Ethiopia, comparing PSNP and non-PSNP program recipients.	Cross-sectional design with community approach comparison.	1555 Children and their mothers/caregivers	Productive Safety Net Program (PSNP)	The Productive Safety Net Program (PSNP) is an Ethiopian government initiative that provides direct support to economically vulnerable and low-income households. The program aims to alleviate poverty and enhance food security through various interventions, including the development of water resources, road maintenance, and school construction.	Women's empowerment was assessed using indicators of household decision-making. Children whose mothers lacked decision-making autonomy at the household level were 3.5 times more likely to experience stunting (AOR = 3.48; 95% CI: 2.36–5.12).

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Sharma & Subramanyam, 2021b) India, 2020, BMJ Open 2020-047276 https://dx.doi.org/10.1136/bmjopen-2020-047276	To examine how fathers' gender-equitable attitudes, mothers' empowerment, and household wealth influence stunting in India	Cross-sectional study Community settings	22,867 fathers and mothers with children aged five years and above, recorded in India's National Family Health Survey (NFHS) 2015–2016	Women's level of empowerment	Women's empowerment was assessed using multiple indicators, including participation in household decision-making (health-care, household purchases, visiting friends/relatives, and control over the husband's income), attitudes toward wife-beating (perceived justification in various situations), ownership of land and housing, and current employment status.	Children from households with mothers or fathers who hold gender-equitable attitudes had lower odds of stunting (adjusted OR = 0.92; 95% CI: 0.84–1.02) and severe stunting (adjusted OR = 0.87; 95% CI: 0.77–0.98) compared to children from households without such parental empowerment.
(P. & Bansal, 2022) India, 2022: PLOS Global Public Health 2(1)e0000134 https://doi.org/10.1371/journal.pgph.0000134	To determine the relationship between maternal autonomy and the incidence of stunting in children aged <35 months	Cross-sectional	17,439 children aged 7–35 months, from the 2015–2016 National Family Health Survey (NFHS).	Women's Autonomy in the household,	1. Decision-making autonomy – including self-care, large-scale household purchases, and visiting family or relatives.; 2. Physical autonomy – the ability to go shopping, access health services, and participate in community activities outside the home.; 3. Financial autonomy – knowledge of loans for business development, ownership of a bank account, and independent control over personal funds.; 4. Domestic violence-related autonomy – the ability to refuse sex, negotiate household responsibilities, manage child care, go out without notice, and maintain autonomy in domestic decision-making.	Financial autonomy was found to significantly influence the incidence of stunting; mothers with financial autonomy were 0.91 times less likely to have stunted children (95% CI: 0.85–0.98).

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(Bliznashka et al., 2021b); 2021, Sub Africa Safari; PLOS Medicine, 18(9):e1003781; September 16, 2021 https://doi.org/10.1371/journal.pmed.1003781	To examine the relationship between women's empowerment and child development, early education, and nutritional status in sub-Saharan Africa.	Cross-sectional	21,434 mothers aged 15–49 years and their children aged 36–59 months, from DHS data 2011–2018 across 9 SSA countries	Women's empowerment	Women's empowerment was measured using three indicators: 1. Access to and control over resources – including seasonal or fixed income from a spouse. 2. Decision-making – covering use of partner's income, own health care, household purchases, and family visits. 3. Attitudes toward wife-beating – including perceptions regarding engaging in activities without informing the partner, neglecting children, or refusing sex.	Children of highly empowered women demonstrated multiple positive outcomes: 1. Lower risk of suboptimal cognitive development (RR = 0.89; 95% CI: 0.80–0.99).; 2. Higher height-for-age z-score (HAZ) with a mean difference of 0.09 (95% CI: 0.02–0.16).; 3. Reduced risk of stunting (RR = 0.93; 95% CI: 0.87–1.00).; 4. Higher dietary diversity score (DDS) (MD = 0.17; 95% CI: 0.06–0.29).; 5. Greater access to learning resources, with an additional 0.07 resources (95% CI: 0.01–0.13).; 6. Increased stimulation activities, with 0.16 additional activities from mothers (95% CI: 0.06–0.25) and 0.23 from fathers (95% CI: 0.17–0.29).
(McKenna et al., 2019); Congo; 2019; PLoS One 14(12):e0226401 https://doi.org/10.1371/journal.pone.0226041	To evaluate the relationship between women's decision-making power and stunting or wasting among children under five years in the Democratic Republic of Congo	Cross-sectional	3,721 mothers and their children, using 2013–2014 DRC DHS data	Women's decision-making	Women's decision-making, as one indicator of women's empowerment, was assessed through employment, property ownership, attitudes toward domestic violence, and decision-making power. The specific decision-making indicators according to the DRC DHS were: 1. Use of own income.; 2. Spending of the husband's income.; 3. Decisions regarding self-health care.; 4. Purchase of household necessities.; 5. Decisions concerning visits by relatives.	Multivariate regression analysis indicated that none of the five dimensions of women's decision-making power were significantly associated with stunting or wasting among children.

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(Abreha et al., 2020); Ethiopia: 2020; PLoS ONE 15(7):e0235825 https://doi.org/10.1371/journal.pone.0235825	To assess the extent to which women's empowerment is related to children's health status in Ethiopia	Cross-sectional	10,641 women aged 15–49 years with children under 5, using 2016 EDHS data	Women's empowerment	1. Decision-making participation: Involvement in healthcare, household expenditures, visits from relatives, and control over personal income.; 2. Attitudes toward wife-beating: Views on issues related to activities, childcare, sexual autonomy, and food practices.; 3. Healthcare access barriers: Constraints related to permission, finances, distance, and personal limitations.; 4. Asset ownership: Ownership of house and land.; 5. Socio-economic status: Education level and access to information (reading materials, television, internet), financial resources (bank account), and telephone ownership.	1. Women with higher empowerment within the household, particularly in terms of socio-economic status (e.g., greater access to education, information, media, and savings promotion), were less likely to have children who were stunted or wasted ($p < 0.05$). 2. Greater household decision-making power among women was also associated with improved child health outcomes, including lower incidence of pneumonia and anemia ($p < 0.05$).

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Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Iokes et al., 2018); Uganda; 2017; Maternal & Child Nutrition 2018;14:e12483 https://doi.org/10.1111/mcn.12483	To examine the relationship between maternal capabilities (social support, psychological health, decision-making, and empowerment), infant feeding practices, and child nutritional status	Cross-sectional	195 mothers with children aged 0–24 months from the Uganda DHS data	Maternal Capabilities	Maternal Capabilities Indicators: 1. Social Support – measured using the Duke-UNC Functional Social Support Questionnaire (Broadhead et al., 1988).; 2. Psychological Health – assessed according to OECD Guidelines on Measuring Subjective Well-Being (2013).; 3. Decision-Making / Agency – includes: Household and financial decision-making, Ability to make appropriate choices for children, Control over family size and reproductive decisions, Health decision-making: managing serious child health problems, taking health actions according to expectations, and exercising autonomy in personal and child health decisions 4. Freedom / Empowerment – overall autonomy in maternal and child-related choices.	1. Mothers with higher social support scores were significantly more likely to adhere to recommended infant feeding practices, including minimum meal frequency (OR = 1.38; 95% CI: 1.10–1.73), dietary diversity (OR = 1.56; 95% CI: 1.15–2.11), consumption of iron-rich foods (OR = 1.47; 95% CI: 1.14–1.89), and achieving a minimally acceptable diet (OR = 1.55; 95% CI: 1.10–2.21). 2. Maternal empowerment was positively associated with the likelihood of providing diverse and adequate child feeding. 3. The overall maternal capability index was significantly correlated with minimum daily feeding frequency (OR = 1.29; 95% CI: 1.03–1.63), dietary diversity (OR = 1.44; 95% CI: 1.06–1.94), and minimally acceptable diet (OR = 1.43; 95% CI: 1.01–2.01). 4. Higher maternal psychological satisfaction was unexpectedly associated with an increased likelihood of stunting in children (OR = 1.31; 95% CI: 1.06–1.63).

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Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Azupogo, Abizari, Aurino, & Gelli, 2020); Ghana, 2020 Nutrients; 2020,12,2737 doi:10.3390/nu12092737	This study aims to examine the relationship between malnutrition, pre-hypertension/hypertension (PHH) and sex among adolescents.	RCT	Dhana DHS 2014 Non-pregnant female adolescents (n=857) and male adolescents (n=870) aged 15-19 years.	Autonomy and empowerment	Autonomy and empowerment indicators: 1. Attitudes towards wife beating (going out without telling, neglecting children, arguing with him, refusing to have sex, processing food). 2. Property ownership (land and house ownership)	1. The empowerment index significantly reduced the risk of stunting among female adolescents (PRR = 0.82; 95% CI: 0.67–0.99) but increased the risk of obesity (PRR = 1.31; 95% CI: 1.02–1.68).; 2. High Wealth Index (HWI) increased the risk of obesity in female adolescents but decreased stunting and pre-hypertension/hypertension in male adolescents.; 3. Improved household water, sanitation, and hygiene (WASH) conditions reduced the risk of stunting by 15% in male adolescents.
(Egbuonye et al., 2021); Nigeria, 2021; Nutrients 2021,13,2961 https://doi.org/10.3390/nu13092961	To assess Children's Diet Diversity (CDD) among children aged 6–23 months in Niger, examine differences in CDD between children living in urban and rural areas, and identify maternal factors influencing CDD.	Cross-sectional	Data from the Niger DHS 2012 Mothers aged 15-49 years and children aged 6-23 years totalled 1265	Women's empowerment: women's decision-making	Women's empowerment was assessed through maternal decision-making in household matters, including healthcare, spending income, making large household purchases, and deciding on visits to family members or relatives.	1. A positive association was observed between women's decision-making scores and children's diet diversity (CDD) among children aged 6–23 months; higher maternal decision-making scores were associated with a 0.05 increase in CDD (p = 0.009; 96% CI: 0.056–0.088). 2. Children residing in urban areas had a 0.146 higher CDD score compared to those living in rural areas."

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(Jisso et al., 2022); Ethiopia; 2022; JNS/Journal of Nutritional Science (2022) Vol 11, e92, pages 1-9 https://doi.org/10.1017/jns.2022.86	To examine the relationship between women's empowerment and the components of the empowerment domain with children's nutritional status.	unity-Based cross-sectional	Mothers/caregivers aged 15-49 years and children aged 6-59 years are not as many as 429	Women empowerment	Women's empowerment was measured using the Abbreviated Women's Empowerment Index (A-WEAI), encompassing five domains: (1) Production – decision-making in production, (2) Resources – asset ownership and access to/decision-making for credit, (3) Income – control over the use of income, (4) Membership – participation in groups or communities, and (5) Time – allocation of working hours.	1. The multidimensional five-domain empowerment index (5DE) was not a significant predictor of children's nutritional status ($P > 0.05$). 2. Specific factors predictive of child stunting included powerlessness in production decision-making (AOR = 8.85), empowerment in income control (AOR = 0.35), and the availability of livestock (AOR = 0.38).
(Besnier, 2023); 2023 Norway Global Public Health 2023, Vol 18, No. 1, 1849348 https://doi.org/10.1080/17441692.2020.1849348	To explore women's empowerment, particularly political empowerment, in relation to improving the health status of children aged five years and older.	Cross-sectional	Data on children under five years of age who experience death, stunting, and immunization from 161 countries (Global Burden of Disease Collaborative Network 2018)	Women's political empowerment	The role of women in child health, in the context of women's political empowerment, was assessed through three components: 1. Women's agency participation, influenced by (a) the socio-economic and political context, including the role of women in government, policies, norms, and values, and (b) the socio-economic position of women, including education, occupation, income, gender, and ethnicity. 2. Women's choices are influenced by both individual characteristics and maternal, social, psychological, behavioral, and biological factors.	1. The Women's Political Empowerment Index (WPEI) was associated with modest improvements in child nutrition and immunization. 2. Women's political empowerment had a greater impact on child mortality in low-income and less-developed countries. 3. The effect of women's political empowerment on stunting was stronger in middle-income countries. 4. The impact was less pronounced in developed countries

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(Christian, Atilo, et al., 2023); 2023 Africa Maternal & Child Nutrition; 2023; 19; e13520 https://doi.org/10.1111/mon.13520	To determine the relationship between women's empowerment and children's nutritional status, considering the role of household leadership structure.	Cross-sectional	Demographic and Health Survey (DHS) data 2015-2018 in Sub-Saharan Africa: N: 25,665 mothers aged 15-49 years and children aged five years	Women's empowerment	Women's empowerment was assessed across three domains: 1. Household decision-making encompasses control over personal income, spending money, visiting family, making large household purchases, buying daily necessities, and decisions regarding health services. 2. Attitudes toward domestic violence include behaviors such as preparing food, arguing with the husband, leaving without notice, ignoring children, and refusing sexual relations. Ownership of assets, whether sole or joint ownership	1. Increasing the women's empowerment index was associated with a reduced likelihood of children being anemic and experiencing both anemia and stunting [coeff (SE), -0.114 (0.025) and -0.072 (0.032)]. 2. Higher asset ownership or greater empowerment in household decision-making significantly reduced the likelihood of anemia and the co-occurrence of anemia and stunting in children. 3. Girls from male-headed households were more likely to be anemic and to experience concurrent anemia and stunting compared to peers from female-headed households.
(Imai, Annim, Kulkarni, et al., 2014b); 2014 India World Development 2014 Vol 62, pp 88-105 https://dx.doi.org/10.1016/j.worlddev.2014.05.001	To determine the relationship between women's empowerment (education, domestic violence, and autonomy) and children's nutritional status.	Cross-sectional	National Family Health Survey (NFHS) data for 1992-1993, 1998-1999, 2005-2006	Women's empowerment	Women's empowerment was assessed using three indicators: 1. The ratio of maternal to paternal education. 2. Experience of domestic violence. 3. Wife's autonomy in household decision-making.	1. Higher maternal education was associated with better child nutritional status. 2. Exposure to domestic violence was positively associated with poorer children's nutritional status. 3. Greater autonomy in household decision-making has been shown to reduce the risk of child stunting.

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Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Holland & Rammohan, 2019); Bangladesh 2019 World Development 124(2019) 104648 https://doi.org/10.1016/j.worlddev.2019.104648	To determine the influence of women's empowerment in agriculture on children's food security	Cross-sectional	Data from The Bangladesh Integrated Household Survey (BHS) 2011-2012 and 2015 486 children	Women's empowerment	Women's empowerment with five domains; 1. Production: Decision-making regarding agricultural production and autonomy in production. 2. Resources: Ownership of assets, decision-making in spending, sales, and transfer of assets, as well as access to credit. 3. Income: Control over income and its utilisation. 4. Leadership: Participation in groups, community membership, and confidence in public speaking. 5. Time: Allocation of time for work and rest. Mother's knowledge (as a confounding variable): breastfeeding, the practice of providing additional food and drink, purchasing supplements, and the ability to recognise symptoms of iron deficiency/anemia	1. Women's empowerment across the five domains showed a positive association with children's height-for-age. 2. Women's autonomy in agricultural production and confidence in public speaking were positively associated with height-for-age and negatively related to the incidence of stunting. 3. Women's empowerment across the five domains was positively associated with household dietary diversity.
(Ewerling et al., 2017); 2017 Africa Lancet Global Health, 2017; 5: e916-23 https://dx.doi.org/10.1016/S2214-109X(17)30292-9	To develop women's empowerment indicators using individual-level Demographic and Health Survey (DHS) data	Demographic Survey	Demographic Health Survey data from 34 African countries; Women aged 15-49 years total 280209	Gender Development Index And Survey-based Women's Empowerment Index (SWPER)	Survey-based Women's Empowerment Index (SWPER) Dimensions; 1. Attitude to Violence / Attitude towards violence (leaving without permission, leaving children, arguing with husband, refusing to have sex, finishing food); 2. Socially Independent/ social freedom (Education, information, determining the age for first pregnancy, and age when deciding to live together); 3. Decision Making (health services, household shopping, visiting relatives, and working after 12 months); Gender Development Index: Taking into account the country's level of Health, Education, and command over economic resources	1. All dimensions of the SWPER demonstrated moderate to high correlations with the Gender Development Index (GDI). 2. The social independence dimension was positively associated with greater coverage of maternal and child health interventions. 3. Women's attitudes toward violence and their participation in decision-making were consistently associated with higher uptake of modern contraceptive methods.

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(Matare et al., 2021); Zimbabwe The Journal of Nutrition ; Community and Inter- national Nutrition; 2021; 151:685-694 him: https://doi.org/10.1093/jn/nxaa255	To identify factors influencing maternal parenting capabilities	RCT	Hygiene Infant Nutrition Efficacy (SHINE) program	Maternal Capability	SHINE It is a community-based intervention conducted in two adjacent villages in Zimbabwe, implemented through home visits by nurses responsible for 1-4 areas. Interventions are grouped into four groups of interveners 1. Standard care; 2. Water, sanitation & hygiene (WASH); 3. Infant and young child feeding (IYCF) + WASH 4. WASH + IYCF Home Visits are conducted after two weeks of data collection, 32 weeks of gestational age and when the baby is 1, 3, 6, or 18 months old.	1. Mothers with more egalitarian gender norm attitudes were significantly more likely to have a vaginal delivery (AOR 2.06; 95% CI 1.57–2.69), initiate breastfeeding within one hour of birth (AOR 1.38; 95% CI 1.03–1.84), and exclusively breastfeed from birth to three months (AOR 2.55; 95% CI 1.95–3.35) and from three to six months (AOR 1.75; 95% CI 1.36–2.25), particularly among households receiving WASH interventions (AOR 1.76; 95% CI 1.29–2.39). 2. Mothers experiencing time-related stress were less likely to exclusively breastfeed from birth to three months (AOR 0.79; 95% CI 0.66–0.93). Greater social support was positively associated with vaginal delivery (AOR 1.53; 95% CI 1.37–1.98) and with breastfeeding outcomes among mothers receiving IYCF interventions (AOR 1.18; 95% CI 1.01–1.37). 3. Depressed mothers were significantly less likely to have a vaginal birth (AOR 0.63; 95% CI 0.44–0.88) and to have a fully immunised child (AOR 0.67; 95% CI 0.50–0.90), corresponding to 37% and 33% reduced likelihoods, respectively

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Kulkarni et al., 2021) Nepal 2021 The Journal of Nutrition: Community and Inter- national Nutrition 2021; 151:1018-1024 https://doi.org/10.1093/jn/nxaa399	To examine the relationship between women's and men's intra-household bargaining power and children's nutritional status (height-for-age z-score, HAZ)	Cross-sectional	2,170 mothers and fathers with children aged 0–59 months; Suaahara 1: multi-sectoral maternal and child nutrition program funded by USAID	Intrahousehold bargaining power	Intrahousehold bargaining power It consists of 4 Domains: 1.Ownership and control of assets 2.Social participation 3.Utilization of time for activities (working hours) 4.Control over decision-making in the household	1. Women's ownership and control of assets were positively associated with child height-for-age z-scores (HAZ) when both women's and men's domains were modelled together ($\beta = 0.0597$, $P = 0.026$).;2. Male social participation was positively related to HAZ in the male-only model ($\beta = 0.233$, $P < 0.001$) and in the combined female-male model ($\beta = 0.188$, $P = 0.001$).;3. Women's workload was negatively associated with HAZ in the female-only model ($\beta = -0.0503$, $P = 0.014$) and in the combined model ($\beta = -0.056$, $P = 0.008$).;4. Household decision-making was negatively associated with HAZ in gender-specific models for both women ($\beta = -0.0631$, $P = 0.007$) and men ($\beta = -0.0546$, $P = 0.017$). 5.Women's social participation, men's ownership and control of assets, and men's workload were not significantly associated with HAZ.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Santoso et al., 2021) 2021 Tanzania The Journal of Nutrition; Community and International Nutrition 2021; 151:2010-2021 https://doi.org/10.1093/jn/nxab052	To evaluate nutrition-sensitive agroecology interventions to improve children's dietary diversity, food security, nutritional status, sustainable agricultural practices, women's empowerment, and women's welfare.	RCT	591 households with children aged ≤1 year in 20 villages (Control: 295; Intervention: 296); integrated curriculum on agriculture, nutrition, and women's empowerment over 2 years	The Singida Nutrition and Agroecology Project (SNAP-Tz) Intervention: Integrated curriculum on agricultural practices, nutrition, and women empowerment done for two years	1. Women's Empowerment: decision-making, revenue allocation, workload management, leisure time, husband-assisted activities. 2. Women's Well-being: minimal dietary diversity, social support, freedom from depression	1. The intervention significantly increased children's dietary diversity scores by 0.57 food groups (out of 7; $P < 0.01$), and the proportion of children achieving minimum dietary diversity (≥ 4 food groups) increased by 9.9 percentage points during the post-harvest season.; 2. The intervention significantly reduced household food insecurity but had no significant effect on child anthropometric measures.; 3. The intervention also promoted sustainable agricultural practices, enhanced women's empowerment, and improved women's overall welfare.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Olney et al., 2015) Burkina Faso 2015 The Nutrition Journal: Community and International Nutrition; 2015 him: https://doi.org/10.3945/jn.114.203539	To evaluate the impact of an integrated agriculture, nutrition, and behavior change program on stunting, wasting, malnutrition, hemoglobin, anemia, and diarrhea in children aged 3–12.9 months	RCT	Mothers and children aged 3–12.9 months in 55 villages; Intervention: 15 villages, Control: 25 villages. Program included home visits twice a month for six months	Helen Keller International Program – Integrated agriculture and nutrition change behavior program	Helen Keller International Program – Intervention Details, consisted of three groups: 1. Control Group: 25 villages received no IPR intervention. 2. Intervention 1 (OWL – Older Women Leaders): 15 villages received agricultural production support combined with Behavior Change Communication (BCC). OWL focused on prenatal and postnatal counseling, including guidance on the birthing process. 3. Intervention 2 (HC – Health Committee): 15 villages received agricultural production support combined with BCC. HC focused on nutrition and health interventions, including maternal nutrition, prevention and treatment of anemia, iodine supplementation, prevention of vitamin A deficiency, promotion of breastfeeding, complementary feeding, and nutrition for sick or malnourished children. Program Delivery: Home visits were conducted twice a month for a period of six months. Evaluation outcomes: The mothers' knowledge was assessed regarding Infant and Young Child Feeding (IYCF, including breastfeeding and complementary feeding), handwashing practices, dietary diversity, and iron intake.	The integrated agriculture, nutrition, and health behavior change program had modest but notable effects ($P < 0.10$): 1. Hemoglobin increased (DID 0.51 g/dL; $P = 0.07$). 2. Wasting decreased (DID 28.8 percentage points; $P = 0.08$). 3. Diarrhea prevalence decreased significantly (DID 215.9 pp; $P < 0.05$). 4. Anemia prevalence decreased (DID 214.6 pp; $P = 0.03$), and mean hemoglobin increased (DID 0.74 g/dL; $P = 0.03$) in Health Committee (HC) intervention villages compared to controls. 5. There was no significant impact on the prevalence of stunting or underweight. 6. Women's knowledge regarding Infant and Young Child Feeding (IYCF) practices and handwashing before feeding children increased.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Gelli et al. , 2018) Malawi 2018 The Journal of Nutrition: Nutritional Epidemiol- ogy; 2018;148: 1587- 1597 https://doi.org/10.1093/jn/nxy148	To evaluate the impact of a 1-year early childhood development program integrating agriculture and nutrition interventions on household production diversity, maternal nutrition knowledge, feeding practices, child diet, and child nutritional status	RCT	1,248 pre-school-aged children (36–72 months) and 304 younger siblings (6–24 months) across 60 community-based child centers (CBCCs)	1-y early childhood development (ECD)	Intervention: The intervention combined the Save the Children's Early Childhood Development (ECD) program with NEEP Agriculture & Nutrition. This integrated program aimed to increase household production diversity and included Behavior Change Communication (BCC). Outcomes Assessed: Time allocation and decision-making related to childcare and stimulation, food preparation for preschool children, maternal nutrition knowledge, and effective farming techniques.	1.Preschool children in the intervention group demonstrated improved nutrient intake and dietary diversity compared to the control group. 2.Among younger siblings, the intervention increased height-for-age z-scores (HAZ) (DID 0.44; $P < 0.05$) and reduced the incidence of stunting by 17 percentage points (DID -17 pp; $P = 0.05$). 3.The intervention also enhanced maternal knowledge, particularly regarding the importance of dietary diversity.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Kim et al., 2019) Ethiopia 2019 The Journal of Nutrition; Community and International Nutrition 2019; 149:1470-1481 https://doi.org/10.1093/jn/nxz087	To evaluate the impact of Alive & Thrive (A&T) on complementary feeding practices, maternal knowledge, and children's nutritional status	Cross-sectional	Household Survey of children aged 6-23.9 months in 2015 – 2016 N: 2720 (Intervention: 1360; control 1360) each of the ten areas	Alive & Thrive (A&T) Program	Intervention: The Alive & Thrive (A&T) program, a behavioral change package including intensive interpersonal communication (IPC), nutrition-sensitive agriculture (AG), community mobilization (CM), and mass media (MM) campaigns. Control: Standard interpersonal counseling and mass media campaigns. Outcomes assessed: maternal knowledge and complementary feeding practices based on WHO indicators, including: 1. Minimum dietary diversity (≥ 4 of 7 food groups/24h); 2. Age-appropriate meal frequency; 3. Minimum acceptable diet; 4. Consumption of iron/iron-rich foods; 5. Appropriate timing of the introduction of food textures	The intervention significantly reduced the risk of stunting in children aged 6–23.9 months. The differential effect estimate (DDE) indicated a 5.6 percentage point reduction ($P < 0.05$), with stunting prevalence decreasing from 36.3% in the control group to 22.8% in the intensive intervention group.
(Heckert et al., 2023) Burkina Faso 2023 Journal of Rural Studies (2023)103026 https://doi.org/10.1016/j.jrurstud.2023.103026	To evaluate the impact of the SELEVER program (livestock and nutrition-sensitive intervention) on women's empowerment	Mix Method/ RCT	1763 families	SELEVER: Family farming program promoting poultry production to improve rural economy; compared SELEVER vs SELEVER + WASH interventions	1. Empowerment Indicators: intrinsic (Income autonomy, self-efficacy, attitudes toward IPV, family respect), instrumental (decision-making, asset ownership, financial access, income control, work hours, mobility), and collective agency (group membership/influence); 2. Health & Nutrition Agency: decisions on diet/health during pregnancy and breastfeeding, healthcare use, and access to food/health products; 3. Livestock-specific Empowerment: production decisions, farm ownership, farming income, and time allocation; 4. Additional Measures: self-efficacy, exposure to violence, production and asset decisions, funding, income, time use, mobility, and group influence.	SELEVER and SELEVER + WASH interventions did not significantly improve women's empowerment in intrinsic, instrumental, collective, or livestock-specific domains.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Habtu et al., 2023); Rwanda; 2023; Current Developments in Nutrition 7(2023) 100018 https://doi.org/10.1016/j.cdnut.2022.100018	To explore the effects and challenges of integrated nutrition interventions for pregnant and breastfeeding women	Qualitative	25 health cadres, 27 nutritionists, 80 women (40 pregnant, 40 breastfeeding) in 10 discussion groups	Gikuriro Program: An integrated nutrition-intervention package including nutrition education and counseling (specific intervention) and agriculture promotion, financial literacy, economic resilience, and WASH access (sensitization interventions).	Gikuriro Program: An integrated nutrition-intervention package comprising one specific intervention (nutrition education and counseling by health cadres and nutritionists) and three sensitive interventions (promotion of agricultural products, financial literacy/economic resilience, and improved access to WASH services).	Results: The Gikuriro Program improved maternal knowledge and skills in nutrition (balanced cooking, saving, kitchen gardening, and hygiene), enhanced a healthy eating mindset, and strengthened financial empowerment and household economy. Challenges & Limitations: Low program awareness and participation, cultural/religious barriers, economic constraints, limited partner/family support, and restricted inclusivity targeting mainly higher social classes.
(Malapit & Quisumbing, 2015); 2015; Ghana Food Policy 52 (2015) 54-63 http://dx.doi.org/10.1016/j.foodpol.2015.02.003	To explore effects and challenges of integrated nutrition interventions for pregnant and breastfeeding women	Cross-sectional	2,027 mothers (15–49 years) and 147 children (5 years) from Feed the Future Population-based Survey, 2012	Women's empowerment in Agriculture Index (WEAI) = 5 Dimensions Empowerment (5DE) + The gender parity index (GPI)	Intervention / Exposure: Women's Empowerment in Agriculture Index (WEAI), comprising five domains: 1. Production – decision-making and autonomy in agricultural production; 2. Resources – asset ownership, transactions, and access to financing; 3. Income/Revenue – control over income; 4. Leadership – group participation and public speaking; 5. Time allocation to work and leisure includes the Gender Parity Index (GPI). Nutritional Outcomes: 1. Child – IYCF practices (including breastfeeding and minimum acceptable diet) and anthropometry (HAZ, WHZ, WAZ); 2. Mother – dietary diversity	1. Women's empowerment was strongly associated with better infant and young child feeding (IYCF) practices; 2. Empowerment in financial decision-making, especially regarding credit, was positively linked to maternal dietary diversity.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Sraboni & Quisumbing, 2018); Bangladesh; 2018; Food Policy 81 (2018) 21-36 https://doi.org/10.1016/j.foodpol.2018.09.001	To examine the relationship between women's empowerment in agriculture and individual diet quality indicators	Cross-sectional	N = 2,896 households (7,506 adults; 1,786 adolescents 11–17 years; 2,015 children 6–10 years; 1,024 children <5 years) from Bangladesh Integrated Household Survey (BIHS) 2012)	Women's empowerment in Agriculture Index (WEAI) = 5 Dimensions Empowerment (5DE) + The gender parity index (GPI)	Intervention / Exposure: Women's Empowerment in Agriculture Index (WEAI), comprising five domains—Production (decision-making, autonomy), Resources (asset ownership and access to financing), Income/Revenue (control over income), Leadership (group participation, public speaking), and Time (work and leisure)—plus the Gender Parity Index (GPI). Outcomes / Measures: Age-specific dietary diversity (7 food groups for children 6–59 months and 5–10 years; 9 food groups for adults ≥18 years) and nutrient intake (carbohydrates, protein, iron, zinc, vitamin A).	Women's empowerment was positively and significantly associated with dietary diversity and nutrient intake among adult men and women
(Quisumbing et al., 2021); Africa 2021 Food Policy, 100(2021)102001 https://doi.org/10.1016/j.cdnut.2022.100018	To examine the relationship between women's empowerment, household dietary diversity, maternal dietary diversity, and BMI.	Cross-sectional	Data from Feed the Future population-based survey in Bangladesh (2011), Cambodia (2012), Ghana (2012), Mozambique (2012-2013), Tanzania (2016), Suahara (2012)	Women's Empowerment Agriculture Indexes	Women's Empowerment in Agriculture Index Women's empowerment is commonly assessed through three indicators: resources (material, human, and social), agency (decision-making and negotiation), and achievements (welfare outcomes). The Women's Empowerment in Agriculture Index (WEAI) comprises the Five Domains of Empowerment (5DE) and the Gender Parity Index (GPI). The five domains are: production (decision-making and autonomy), resources (asset ownership and financial access), income (control over earnings), leadership (group participation and public speaking), and time (work–leisure balance).	Significant association between empowerment scores and nutritional status. Women's empowerment scores were positively associated only with children's height-for-age z-scores (HAZ).

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Bonis-profumo et al., 2021); East Timor; 2021; Food Policy 102 (2021) 102102 https://doi.org/10.1016/j.foodpol.2021.102102	To examine the relationship between women's empowerment, household production, and dietary diversity in children (12–59 months) and their mothers.	Cross-sectional	N: 1415 people, 259 adults (156 women and 103 men) and 156 children aged 12-59 months	Community Driven Nutrition Improvement Project (CDNIP), Women's Empowerment Index (A-WEAI)	The Community-Driven Nutrition Improvement Project (CDNIP) (2014–2018), funded by the World Bank and implemented by Catholic Relief Services, targeted pregnant and lactating women with children under two years in 50 remote villages of Baucau and Viqueque, Timor-Leste. Women's empowerment was measured using the WEAI, covering five domains: production, resources, income, leadership, and time, along with the Gender Parity Index (GPI).	1.The associations between various empowerment measures and dietary diversity were larger and more significant among women than children. 2.Diversity of food production has been consistently associated with improvements in children's diets. 3.small gender gaps in decisions about production, access to resources, and control over income
(de Groot et al., 2022); Ghana; 2022 Food Policy 107 (2022)102217 https://doi.org/10.1016/j.foodpol.2021.102217	To assess the impact of Ghana's cash transfer program with health insurance fee exemption on maternal and child nutritional status after one year.		Evaluation of 2,500 families; target population: 8,058 households; 3,619 received CT.	Cash Transfer (CT) Program	Cash Transfer (CT) Program (LEAP + NHIS): monthly benefits GH¢38–53 (USD 9.5–13.25) for 24 months; pilot in 10 districts of Northern and Upper Eastern Ghana.	1.No significant impact on maternal or child nutritional status. 2.Household food security improved, but the frequency of children's meals declined. 3.Cash transfers alone were insufficient to improve child nutrition
(Jones et al., 2019); East Africa; 2019 SSM-population Health 9 (2019)100475 https://doi.org/10.1016/j.ssmph.2019.100475	To examine the relationship between women's empowerment and children's nutritional status.		Demographic and Health Survey (DHS) 2011-2016 in East Africa: Married women (15-49 years) with children aged 6-24 months (N: 13780)	Women's Empowerment	Women's Empowerment: measured across three domains—(1) human and social assets (marriage, fertility, age at first intercourse), (2) intrinsic agency (mobility, childcare, household autonomy), and (3) instrumental agency (income, healthcare, major spending, family visits).	1.Women's empowerment domains showed positive associations with maternal BMI (assets: $\beta = 0.17$, SE = 0.03; intrinsic agency: $\beta = 0.03$; instrumental agency: $\beta = 0.03$, SE = 0.01); 2.Maternal BMI was positively associated with child HAZ ($\beta = 0.08$, SE = 0.04) and WHZ ($\beta = 0.35$, SE = 0.03); 3.Human and social assets influenced child HAZ and WHZ indirectly through intrinsic agency and maternal BMI.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Onah, 2021); South Asia 2021 SSm-Population Health 13 (2021)100718 https://doi.org/10.1016/j.ssmph.2020.100718	To examine the relationship between SWPER, Women's Wealth Index, and child nutritional status.	Cross-sectional	Demographic Health Survey in 5 South Central Asia countries 2012 N 24712	Survey-based Women's Power Index (SWPER) Women Wealth Index / socio-economic status	Survey-based Women's Empowerment Index (SWPER) includes three dimensions: 1. Attitude toward Violence – perceptions of gender norms and tolerance of domestic violence; 2. Social Independence – education, access to information, and control over reproductive decisions (e.g., age at first pregnancy and cohabitation); 3. Decision-Making – autonomy in healthcare, household purchases, and visiting relatives.	Empowering women by enhancing social independence and decision-making power contributes to reducing the risks of stunting, wasting, and underweight in children, with the strongest effects observed among low-income households.
(Bonilla et al., 2017); Zambia; 2017; Women Development Vol 95 pp 55-72 http://dx.doi.org/10.1016/j.worlddev.2017.02.017	To evaluate the impact of the Government of Zambia's Child Grant Program on women's decision-making and empowerment	Mix Method	Quantitative – 5-year longitudinal RCT (2,519 households, 2,031 female caregivers, three rural districts); Qualitative – 30 in-depth interviews (IDIs) with women, 10 with male partners/decision-makers.	Cash Women Transfer is one of The Government of Zambia's Child Grant Program programs.	The Zambia Child Grant Program's Cash Transfer for Women provided bi-monthly cash payments of USD 120 (≈ approximately USD 24) to female caregivers. A 5-year RCT (2,519 households) and qualitative IDIs (30 women, 10 men) examined impacts on decision-making across nine domains (child health, schooling, income, spending, clothing, visits, own health), household dynamics, empowerment, and well-being.	1. Women in beneficiary households gained greater autonomy, making independent or joint decisions in five of the nine domains. 2. However, qualitative findings reveal that entrenched gender norms continue to position men as primary household decision-makers, limiting broader shifts in intra-household relations.
(Sraboni et al., 2014); Bangladesh; 2014 World Development vol 61 pp 11-52 http://dx.doi.org/10.1016/j.worlddev.2014.03.025	To examine the relationship between women's empowerment in agriculture and nutritional outcomes	Cross-sectional	Bangladesh Integrated Household Survey (BIHS) N 3273 Household	Women's Empowerment Index in Agriculture (WEAI)	The Women's Empowerment in Agriculture Index (WEAI) includes five domains of empowerment (5DE) and the Gender Parity Index (GPI): production (decision-making and autonomy), resources (ownership, transfer, and financial control), income (control over earnings), leadership (group participation and public speaking), and time (work-leisure balance). Outcomes were assessed through per capita calorie availability, household dietary diversity, and adult BMI.	1. Women's empowerment was positively associated with calorie availability and dietary diversity. 2. However, wealth, education, and employment had a stronger influence on adult nutritional status than women's empowerment.

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Brar et al., 2020); Senegal; 2020; Am J Clin Nutr 2020; 112: 860S-874S https://doi.org/10.1093/ajcn/nqaa151	To identify the factors associated with stunting among children under five years old	Mix method (Systematic et al., Quantitative methods)	Systematic Literature Review; Data from November 2017 and December 2018 Qualitative : DHS for three decades Children aged <5 years who experience stunting with complete anthropometric data.	Stunting Reduction Program	Stunting Reduction Program: Immunization; 1. Community Nutrition; 2.Clean water sector; 3.Vitamin Supplements; 4.Ten years of education and training; 5.Co-ordination to combat malnutrition; 6.Nutrition opportunity program (1&2); 7.Long-term clean water supply; 8.Clean water and sanitation for millennials; 9.National program for local potential development; 10.Child nutrition and social transfers; 11.Child nutrition and food security;12.Family safety scholarship; 13.Gox; 14.Food fortification opportunities;15.Agriculture and nutrition development for food security;16.Agricultural investment;17.Integrated education and nutrition;18.Community Health Program;19.Multi-sector nutrition planning strategy	The prevalence of stunting declined significantly from 34.4% (1990) to 16.5% (2019).
(Tasic et al., 2020); Ethiopia; 2020; Am J Clin Nutr 2020; 112: 875S-893S https://doi.org/10.1093/ajcn/nqaa163	To identify factors associated with stunting in Ethiopia (2000–2016)	Mix method (Systematic et al., Quantitative methods)	Data from 10789 articles 1990 – 2019 Quantitative : DHS 2000, 2005, 2011, 2016 Children aged <5 years who experience stunting with complete data during four surveys.	Stunting Reduction Program	Stunting Reduction Program: 1.Immunization; 2.Basic education, technical and vocational training; 3.Development of the Health Sector; 4.Development of the Education sector; 5.Health Expansion; 6.Support strategy; 7.Increasing the range of strategies and targets for replacement food for surviving children; 8.Safe loan program; 9.Community-based nutrition; 10.Essential nutritional action; 11.National Nutrition Program; 12.Water and sanitation; 13.MTBS; 14.Agricultural development; 15.SUN (Sustainable Undernutrition); 16.Sustainable reduction in malnutrition; 17.One Wash National program; 18.National Indicative Program for Ethiopia; 19.Health sector transformation plan	Prevalence of stunting decreased from 66.9% (1990) to 38.4% (2018).

Cont. Table 5. Data Extraction of Included Studies (n=53)

Authors, Country, Year, Journal	Objective	Design	Sample	Intervention	Description	Results
(Aziz et al., 2020); Pakistan; 2020; Land use policy 94(2020)104529 https://doi.org/10.1016/j.landusepol.2020.104529	To examine the relationship between women's empowerment and food security in rural Pakistan.	Cross-sectional	600 women from 16 villages	Empowerment	Empowerment dimensions: legal rights, information & communication, family law, social support, infrastructure, ownership	1.Women's empowerment through legal rights, ICT, social support, and family rights significantly improved food security by enhancing bargaining power over resources, leading to better food quality and higher food expenditure.;2.Infrastructure and land rights had limited effects, suggesting the persistence of gender norms.;3.Women's restricted mobility, limited access to land and resources, and lack of confidence constrained their capacity to secure food independently.;4.Fear of conflict and domestic violence further hindered women's ability to claim their rights, negatively affecting food security.;5.The findings underscore the importance of gender-sensitive policies that address structural inequalities and enhance women's empowerment to enhance food security.
(Tchakounté Tchumi, 2023); Cameroon; 2023; Taylor & Francis; Vulnerable Children and Youth Studies 2023, vol 18 No 2, 263-281 https://doi.org/10.1080/17450128.2022.2141405	To examine the relationship between maternal empowerment dimensions and child stunting and wasting	Cross-sectional	Data from the Cameroon Demographic and Health Survey 2018	Maternal empowerment	Maternal Empowerment Dimensions:1.Economic Status Index (ESI): Mother's employment, home ownership, and land ownership.;2.Control over Financial Resources Index (CFRI): Decision-making regarding the use of the mother's and husband's income, ability to conduct financial transactions via telephone, and ownership of bank or financial accounts.;3.Decision-Making Index (DMI): Participation in decisions related to maternal health services, household purchases, and visiting relatives	1.Higher maternal economic status increased the odds of childhood stunting but reduced the odds of wasting. 2.Greater maternal control over financial resources significantly decreased the likelihood of both stunting and wasting. 3.Maternal participation in household decision-making was also associated with reduced risks of stunting and wasting in children.

Results

A total of 53 studies were included in this integrative review, spanning publications from 2014 to 2023 (Figure 1). The studies originated from a diverse range of countries, reflecting the global nature of the stunting problem. Ethiopia and the broader Sub-Saharan Africa contributed the largest number of studies ($n = 12$), followed by India ($n = 5$), Ghana and Burkina Faso ($n = 8$ each), and Bangladesh and Pakistan ($n = 6$ each). Several countries, including Canada, Tanzania, Rwanda, Senegal, Timor Leste, and Indonesia, contributed only one study each. Notably, one study (Onah, 2021) utilised data from five South Asian countries (Kyrgyzstan, Tajikistan, Pakistan, Bangladesh, and Nepal), while another (Yaya et al., 2020) drew from the Demographic and Health Surveys across 30 Sub-Saharan African countries. Table 5 summarizes the country-wise distribution.

Indicators of Empowerment

The central theme identified in the reviewed articles

was partnership indicators, which were categorized into two subthemes: household decision-making and support. Decision-making was further divided into two categories: decisions related to maintaining health and decisions associated with meeting nutritional needs. Within health-related decision-making, 15 studies discussed efforts to provide child care, one study addressed child rearing and education, six studies highlighted pregnancy planning, and two studies focused on maintaining environmental health both inside and outside the home, including access to clean water and sanitation (Aziz et al., 2020; Saadah et al., 2022). The support subtheme comprised spousal support, support from other family members, and community support, particularly from health workers. Spousal support was reflected in the freedom to participate in social and economic activities outside the home, as well as open communication, which fostered freedom of expression, joint decision-making, and mutual respect. Support from other family members included the freedom to communicate and interact with relatives. Community support, particularly from

Table 6. Characteristics of Articles by Country of Origin

Country	Number of studies	Authors
Ethiopia	6	(Mekonnen et al., 2021) (Tesfaye & Egata, 2022); (Abreha et al., 2020b); (Jisso et al., 2022); (Kim et al., 2019); (Tasic et al., 2020)
Afrika	6	(Komakech et al., 2022); (Bliznashka et al., 2021); (Christian, et al., 2023) (Christian, Atiglo, et al., 2023); (Ewerling et al., 2017); (Quisumbing et al., 2021); (Jones et al., 2019)
India	5	(Paul & Saha, 2022); (Athavale et al., 2020); (Sharma & Subramanyam, 2021); (P. & Bansal, 2022); (Imai, Annim, & Kulkarni, 2014)
Ghana	4	(Nsiah-Asamoah et al., 2022); (Azupogo et al., 2020); (Malapit & Quisumbing, 2015); (de Groot et al., 2022)
Burkina Faso	4	(Heckert et al., 2019); (Gelli et al., 2017); (Olney et al., 2015); (Heckert et al., 2023)
Bangladesh	6	(Walters et al., 2019); (Heckert et al., 2019); (Holland & Rammohan, 2019); (Holland & Rammohan, 2019); (Kim et al., 2019); (Jones et al., 2019)
Pakistan	4	(Khalid & Martin, 2017); (J.-A. B. Baxter et al., 2023); (Aziz et al., 2020); (Matare et al., 2021)
Gambia	2	(Sey-Sawo et al., 2023); (Bonilla et al., 2017)
Malawi	2	(Walters et al., 2019); (Gelli et al., 2018)
Zimbabwe	2	(Tome et al., 2021); (Matare et al., 2021)
Uganda	2	(Terfa et al., 2022); (Ickes et al., 2018)
Nepal	2	(Poudel et al., 2022); (Kulkarni et al., 2021)
Canada	1	(Yaya et al., 2020)
Tanzania	1	(Wood et al., 2021)
Rwanda	1	(Habtu et al., 2023)
Asia Selatan	1	(Onah, 2021)
Senegal	1	(Tasic et al., 2020)
Cameron	1	(Tchakounté Tchuimi, 2023)
Timor Leste	1	(Bonis-profumo et al., 2021)
Indonesia	1	(Saadah et al., 2022)

Indanah, I., et al. (2026)

health professionals, was documented in 10 articles and involved access to healthcare services.

Factor Influencing Empowerment

Three categories of factors influencing maternal empowerment were identified: socioeconomic factors, maternal characteristics, and child characteristics. Socioeconomic factors included income, occupation, and ownership of assets such as housing and land. Maternal characteristics included maternal education (Abreha et al., 2020; Besnier, 2023; Imai, Annim, Kulkarni, et al., 2014), age (Ewerling et al., 2017; Jones et al., 2019; Onah, 2021) and marital status (Wood et al., 2021). Child-related factors included sex and age of the child (Abreha et al., 2020).

Instrument for measuring empowerment

The analysis revealed that 13 articles explicitly described instruments for measuring empowerment, with four main terminologies: “*empowerment*,” “*women’s empowerment*,” “*maternal capability/autonomy*,” and “*mother empowerment*.” Three articles employed the term empowerment (Baxter et al., 2023; Komakech et al., 2022; Nsiah-Asamoah et al., 2022), while eight specifically used women’s empowerment (Baxter et al., 2023; Mekonnen et al., 2021; Sey-Sawo et al., 2023; Terfa et al., 2022; Walters et al., 2019; Yaya et al., 2020). Two studies applied maternal capability (Paul & Saha, 2022; Tome et al., 2021) and autonomy (Paul & Saha, 2022c), and one study employed the term mother empowerment (Saadah et al., 2022).

Intervention to improve maternal empowerment

Two studies reported intervention programs designed to enhance maternal empowerment: the Enhanced Homestead Food Production (E-HFP) program from Helen Keller International (Enhanced Homestead Food Production) and a Nutrition Education-Based Intervention (Heckert et al., 2019) and a Nutritional Education-based Intervention (Athavale et al., 2020).

The E-HFP program combined agricultural training and input provision, behavior change communication (BCC), optimal infant and young child feeding (IYCF), health and hygiene practices, nutrition promotion, and community-focused activities. The nutrition education-based intervention applied the Infant and Young Child Feeding (IYCF) guidelines to improve children’s nutrition up to the age of two years. The guidelines included early initiation of breastfeeding, continued breastfeeding with calcium-rich complementary foods, and provision of solid, semi-solid, and soft foods according to age-specific requirements, with a minimum of three food groups per day.

Impact of Intervention Based on Empowerment Indicators

The maternal empowerment indicators analyzed in

this study were children’s knowledge, self-efficacy, competence and nutritional status

Knowledge

Knowledge is one of the key indicators of empowerment. The success of empowering mothers can be assessed based on the level of knowledge they possess. In the context of addressing child stunting, the required knowledge primarily relates to feeding practices (Gelli et al., 2018; Holland & Rammohan, 2019; Kim et al., 2019; Malapit & Quisumbing, 2015; Olney et al., 2015) and age-appropriate dietary diversity (Sraboni & Quisumbing, 2018).

Knowledge of feeding practices includes understanding early initiation of breastfeeding (EIBF) (Olney et al., 2015), exclusive breastfeeding (Holland & Rammohan, 2019; Malapit & Quisumbing, 2015; Olney et al., 2015), nutrition for children aged 0–5 years (Gelli et al., 2018), and the introduction of complementary foods and beverages. It also encompasses awareness of iron-deficiency anemia symptoms and the use of supplements (Holland & Rammohan, 2019; Olney et al., 2015), as well as handwashing practices (Olney et al., 2015). Furthermore, knowledge of dietary diversity across age groups encompasses familiarity with the seven food groups for children aged 6–59 months and 5–10 years, as well as the nine food groups for adults (Sraboni & Quisumbing, 2018).

Self-Efficacy

Self-efficacy is a key indicator of empowerment (Baxter et al., 2023; Heckert et al., 2019). It reflects a mother’s confidence in her role as a competent caregiver (Athavale et al., 2020; Baxter et al., 2023; Heckert et al., 2023; Tome et al., 2021). Baxter et al., (2023) assessed maternal self-efficacy among mothers of stunted children using the Generalized Self-Efficacy Scale.

Competence/Skills

Enhancing maternal competence is crucial for empowering women. Competencies required include the ability to identify and make decisions regarding childbirth assistance, immunization, early initiation of breastfeeding, and maintaining hand hygiene through proper handwashing with soap and clean water (Matare et al., 2021). Another critical skill is mothers’ ability to practice appropriate child feeding (Heckert et al., 2019; Ickes et al., 2018; Malapit & Quisumbing, 2015; Matare et al., 2021; Nsiah-Asamoah et al., 2022; Olney et al., 2015; Walters et al., 2019).

According to Ickes et al., (2018) and Matare et al., (2021), feeding practices encompass exclusive breastfeeding, complementary feeding at 6–9 months, and ensuring dietary diversity for infants in this age group. Competence also includes continued breastfeeding beyond 12–18 months, provision of iron-rich foods, appropriate meal frequency, and ensuring adequate diets for children aged 6 months

to 23 months. Additionally, mothers should be aware of the dietary diversity across age groups, which includes seven food groups for children aged 6–59 months and 5–10 years, and nine food groups for older children (Sraboni & Quisumbing, 2018).

Child Nutritional Status

Most of the reviewed studies assessed children's nutritional status using the WHO Child Growth Standards. Nutritional indicators include weight-for-age and height-for-age. Stunting is defined as height-for-age ≤ -2 SD, while undernutrition is defined as weight-for-age ≤ -2 SD (Heckert et al., 2019; Khalid & Martin, 2017; Mekonnen et al., 2021; Nsiah-Asamoah et al., 2022; Paul & Saha, 2022; Poudel et al., 2022; Sey-Sawo et al., 2023; Terfa et al., 2022; Walters et al., 2019; Yaya et al., 2020). For adolescents up to 19 years of age, nutritional status was assessed using the WHO Growth Reference (Baxter et al., 2023). Body Mass Index (BMI) categories were also applied: underweight (<18.5 kg/m²), normal (18.5–24.9 kg/m²), overweight (25–29.9 kg/m²), and obese (≥ 30 kg/m²). Stunting in older adolescents was additionally identified at a height <145 cm.

Stunting Interventions across Countries

The review identified research conducted across 20 countries, of which 10 provided comprehensive accounts of their national initiatives aimed at reducing stunting. In Rwanda, the Gikuriro Program was highlighted as an integrated effort combining both nutrition-specific and nutrition-sensitive interventions (Habtou et al., 2023). Similarly, Ethiopia (Tasic et al., 2020) and Senegal (Brar et al., 2020) implemented programs that integrated sensitive and specific nutritional strategies. In Burkina Faso, the Helen Keller International Program focused on agricultural training, the provision of inputs, and behavior change communication to address the underlying causes of stunting (Heckert et al., 2019; Olney et al., 2015). Zimbabwe contributed evidence through two studies describing the Sanitation, Hygiene, Infant Nutrition Efficacy (SHINE) Project, which integrated interventions in water, sanitation, and infant feeding (Matare et al., 2021; Tome et al., 2021). Other countries also developed notable multisectoral nutrition programs, such as Nepal with the Suaahara Program (Kulkarni et al., 2021), Tanzania with the Singida Nutrition and Agroecology Project (SNAP-Tz) (Santoso et al., 2021), Malawi with the Nutrition Embedded Evaluation Program Impact Evaluation (NEEP-IE) (Gelli et al., 2018), and Timor Leste with the Community-Driven Nutrition Improvement Project (CDNIP) (Bonis-Profumo et al., 2021). In addition to these integrated approaches, cash transfer initiatives were reported in Ghana (de Groot et al., 2022) and Zambia (Bonilla et al., 2017), illustrating the diversity of strategies employed globally to address stunting.

Discussion

This review sought to examine and synthesize evidence related to parental empowerment, with a particular emphasis on maternal empowerment, in the prevention of child stunting. The findings revealed four central domains: indicators of maternal empowerment, the measurement instruments used to assess empowerment, interventions designed to enhance empowerment and their subsequent impacts, and the implementation of national stunting reduction programs across various countries. Taken together, these dimensions highlight the crucial role of maternal empowerment as both a determinant and a pathway for enhancing child nutritional outcomes.

Maternal empowerment is conceptualised as a multidimensional construct that encompasses a woman's ability to participate in decision-making, exercise autonomy, and mobilise resources to support child well-being (Ashcraft et al., 2019). The findings highlight that key indicators of empowerment in relation to stunting reduction include mothers' decision-making power, economic independence, knowledge, and personal attributes such as educational attainment and health literacy. These factors are pivotal in shaping maternal practices, particularly in relation to child nutrition, care-seeking, and household resource allocation. Commitment and the role of parents, especially mothers, are needed for early detection of stunting which will ultimately prevent stunting from occurring (Nursalam et al., 2021). The evidence confirms that when mothers possess agency, they are better positioned to adopt recommended infant and young child feeding (IYCF) practices, utilize health services, and ensure adequate dietary diversity, thereby reducing the risk of chronic malnutrition (Abreha et al., 2020; Azupogo et al., 2020; Bliznashka et al., 2021; Nsiah-Asamoah et al., 2022; P. & Bansal, 2022).

The interventions identified across the reviewed studies further reinforce the importance of empowerment as a strategy for addressing stunting. Integrated programs such as Helen Keller International's Enhanced Homestead Food Production (E-HFP) initiative, nutrition education, and IYCF-based programs exemplify the combination of nutrition-specific and nutrition-sensitive approaches (Athavale et al., 2020; Heckert et al., 2019). In the Indonesian context, empowerment programs are situated within the national stunting reduction framework, which distinguishes between specific interventions—targeting women of reproductive age, pregnant women, breastfeeding mothers, and children under two—and sensitive interventions that address structural determinants, including sanitation, food security, healthcare accessibility, and parental knowledge (Ministry of Health Republic of Indonesia, 2018b, 2018a). The review highlights that multisectoral and context-specific interventions are most effective in fostering sustainable

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empowerment, as they address both proximal and distal factors influencing child nutrition. A transdisciplinary approach must be taken to address the stunting problem from upstream to downstream (Rahayuwati et al., 2023).

Beyond programmatic strategies, empowerment interventions operate through three primary mechanisms: knowledge, self-efficacy, and competence. Knowledge provides mothers with the cognitive foundation to make informed choices about feeding practices, dietary adequacy, and hygiene (Kim et al., 2019; Malapit & Quisumbing, 2015). Self-efficacy enhances mothers' confidence in their caregiving roles, enabling them to translate knowledge into consistent practices despite social or economic constraints (Baxter et al., 2023; Tome et al., 2021). Competence reflects the acquisition of practical skills in child feeding, hygiene, and health-seeking behavior, which serve as tangible expressions of empowerment (Olney et al., 2015; Tesfaye & Egata, 2022; Walters et al., 2019). This tripartite model illustrates that empowerment is not merely a matter of access to information but requires simultaneous reinforcement of confidence and practical ability.

The effectiveness of empowerment interventions is ultimately measured by improvements in child nutritional outcomes, particularly reductions in stunting. Consistent with global practice, most studies assessed child nutritional status using the WHO Child Growth Standards, specifically height-for-age and weight-for-age z-scores (Khalid & Martin, 2017c; Walters et al., 2019). The consistent use of these standardized indicators facilitates cross-country comparisons and strengthens the evidence base linking maternal empowerment to child growth trajectories. Importantly, reductions in stunting prevalence following empowerment-based interventions suggest that maternal agency plays a transformative role in disrupting intergenerational cycles of malnutrition.

Nevertheless, this review also highlights several challenges and research gaps. First, the conceptualization of empowerment remains heterogeneous across studies, with many relying on the broader framework of "*women's empowerment*" rather than maternal-specific empowerment (Mekonnen et al., 2021; Yaya et al., 2020). This lack of conceptual clarity complicates cross-study synthesis and underscores the need for more standardized and contextually validated instruments. Second, most interventions focus on short- to medium-term outcomes, with limited evidence on long-term sustainability and intergenerational effects. Finally, while many programs emphasize the mother's role, fewer studies account for the influence of broader family and community dynamics, such as paternal involvement, extended kinship structures, and sociocultural norms that may either enable or constrain maternal decision-making.

In the Indonesian context, these findings underscore the need to move beyond simply

incorporating maternal empowerment into stunting reduction programs to explicitly operationalizing it as a core strategy. Maternal empowerment should be systematically integrated into national policies and primary health care services, particularly through community health centers (Puskesmas) and integrated health posts (Posyandu), by strengthening mothers' decision-making capacity, self-efficacy, and practical parenting skills. Family- and community-based interventions that actively engage fathers and other caregivers are also crucial for creating a supportive environment for sustainable stunting prevention.

In summary, this review confirms that maternal empowerment is a cornerstone of stunting prevention strategies worldwide. Empowerment enhances maternal knowledge, strengthens confidence, and builds competencies that collectively translate into improved child feeding practices and health outcomes. The integration of empowerment-based interventions into national and multisectoral programs represents a promising pathway to accelerate progress toward global nutrition targets. Future research should prioritise the development of standardised measures, the assessment of long-term program impacts, and the inclusion of broader sociocultural dimensions to capture the complex ecosystem within which maternal empowerment and child nutrition are embedded.

The primary aim of this systematic review is to examine the empowerment of mother in the context of stunting prevention: however the quantity of scholarly articles that explicitly reference stunting is notably limited, thereby broadening the scope to encompass children experiencing nutritional status issues, including stunting. An increase in search activities via various search engines is anticipated to enhance the results, particularly in relation to the empowerment of mothers with children affected by stunting. Stunting is one of the nutritional problems faced by children, health workers, especially nurses, must understand that efforts to increase maternal empowerment are not only for preventing stunting but can be applied to other nutritional problems that have the potential to occur in children, especially in the first 1000 days of life.

Conclusions

This integrative review highlights maternal empowerment as a fundamental determinant in the prevention of child stunting. The evidence demonstrates that a combination of household decision-making, family and community support, and broader socioeconomic and maternal characteristics shapes empowerment. Empowered mothers are better equipped to make informed decisions regarding healthcare and nutrition, supported by access to resources, spousal involvement, and professional guidance. Measurement approaches, though diverse, consistently underscore the centrality of autonomy, capability, and decision-

making power in defining empowerment.

Interventions such as the Enhanced Homestead Food Production (E-HFP) program and nutrition education based on Infant and Young Child Feeding (IYCF) guidelines illustrate the effectiveness of integrating nutrition-specific and nutrition-sensitive strategies. These interventions strengthen mothers' knowledge, self-efficacy, and practical competencies, thereby enhancing their caregiving capacity. The positive impact of empowerment is evident in improved child nutritional outcomes, as measured by standardized indicators such as height-for-age and weight-for-age.

National and multisectoral programs implemented across countries further confirm that empowerment-based strategies are most effective when integrated within broader health, sanitation, and food security systems. However, the heterogeneity in conceptualizing and measuring empowerment, coupled with the limited evidence on long-term and intergenerational effects, indicates a critical gap in the current literature.

The concept of maternal empowerment must be implemented in an integrated and systematic manner within maternal and child health (KIA) services at community health centers (Puskemas). Empowerment, which previously focused on passive services, should now actively involve mothers in decision-making on health issues, particularly stunting prevention. Several strategies can be implemented through integrated maternal empowerment policies, including self-monitoring using the KIA handbook, which enables early detection of stunting risks and other potential health problems. Strengthening mother and toddler classes as a space for sharing experiences to increase mothers' confidence and self-efficacy in implementing parenting practices, particularly nutritional patterns, to prevent stunting. Efforts should be made to enhance the role of cadres and other health workers, including nurses, midwives, nutritionists, doctors, and other health professionals, as empowerment facilitators through home visits to provide personal support and ensure mothers are able to make informed decisions regarding nutrition, care, and sanitation at the household level.

Stunting is a chronic nutritional problem that requires participation and cross-sectoral cooperation, so it is necessary to have a mother support group to overcome socio-cultural barriers that hinder access to health care for mothers and toddlers, increase economic empowerment and support from husbands and families, especially the active involvement of husbands in care and create an environment that supports mothers in decision-making related to stunting prevention.

In conclusion, maternal empowerment emerges not only as a key pathway but also as a sustainable strategy for reducing child stunting. Strengthening empowerment through knowledge transfer, confidence-building, and skill development should remain a priority in global nutrition agendas. Future

research must advance the standardization of empowerment measures, evaluate the durability of program outcomes, and integrate sociocultural dimensions to ensure more comprehensive and contextually relevant interventions.

Declaration of Interest

The Authors declare that there is no conflict of interest

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Data Availability

All data underlying the results are available as part of article and no additional source data are required

References

- Abreha, S. K., Walelign, S. Z., & Zereyesus, Y. A. (2020). Associations between women's empowerment and children's health status in Ethiopia. *PLoS ONE*, 15(7), 1–24. <https://doi.org/10.1371/journal.pone.0235825>
- Ashcraft, L. E., Asato, M., Houtrow, A. J., Kavalieratos, D., Miller, E., & Ray, K. N. (2019). Parent empowerment in pediatric health care settings: A systematic review of observational studies synthesis of results: We identified six themes within consequences of empowerment: Increased parent involvement in daily care, improved symptom management. *Patient*, 12(2), 199–212. <https://doi.org/10.1007/s40271-018-0336-2>
- Athavale, P., Hoeft, K., Dalal, R. M., Bondre, A. P., Mukherjee, P., & Sokal-Gutierrez, K. (2020). A qualitative assessment of barriers and facilitators to implementing recommended infant nutrition practices in Mumbai, India. *Journal of Health, Population and Nutrition*, 39(1), 1–12. <https://doi.org/10.1186/s41043-020-00215-w>
- Aziz, N., Nisar, Q. A., Koondhar, M. A., Meo, M. S., & Rong, K. (2020). Analyzing the women's empowerment and food security nexus in rural areas of Azad Jammu & Kashmir, Pakistan: By giving consideration to sense of land entitlement and infrastructural facilities. *Land Use Policy*, 94(February), 104529. <https://doi.org/10.1016/j.landusepol.2020.104529>
- Azupogo, F., Abizari, A.-R., Aurino, E., Gelli, A., Osendarp, S. J. M., Bras, H., Feskens, E. J. M., & Brouwer, I. D. (2020). Malnutrition, hypertension risk, and correlates: An analysis of the 2014 Ghana demographic and health survey data for 15–19 years adolescent boys and girls. *Nutrients*, 12(9), 1–23. <https://doi.org/10.3390/nu12092737>
- Baxter, J. A. B., Wasan, Y., Hussain, A., Soofi, S.

Indanah, I., et al. (2026)

- B., Ahmed, I., & Bhutta, Z. A. (2023). Drivers of malnutrition among late adolescent and young women in rural Pakistan: A cross-sectional assessment of the MaPPS trial. *BMJ Open*, 13(5), 1–11. <https://doi.org/10.1136/bmjopen-2022-063734>
- Beal, T., Tumilowicz, A., Sutrisna, A., Izwardy, D., & Neufeld, L. M. (2018). A review of child stunting determinants in Indonesia. *Maternal & Child Nutrition*, 14(4). <https://doi.org/10.1111/mcn.12617>
- Besnier, E. (2023). Women's political empowerment and child health in the sustainable development era: A global empirical analysis (1990–2016). *Global Public Health*, 18(1). <https://doi.org/10.1080/17441692.2020.1849348>
- Bliznashka, L., Udo, I. E., Sudfeld, C. R., Fawzi, W. W., & Yousafzai, A. K. (2021). Associations between women's empowerment and child development, growth, and nurturing care practices in sub-Saharan Africa: A cross-sectional analysis of demographic and health survey data. *PLoS Medicine*, 18(9), 1–30. <https://doi.org/10.1371/journal.pmed.1003781>
- Bonilla, J., Zarzur, R. C., Handa, S., Nowlin, C., Peterman, A., Ring, H., & Seidenfeld, D. (2017). Cash for women's empowerment? A mixed-methods evaluation of the government of Zambia's child grant program. *World Development*, 95, 55–72. <https://doi.org/10.1016/j.worlddev.2017.02.017>
- Bonis-Profumo, G., Stacey, N., & Brimblecombe, J. (2021). Measuring women's empowerment in agriculture, food production, and child and maternal dietary diversity in Timor-Leste. *Food Policy*, 102, 102102.
- Brar, S., Akseer, N., Sall, M., Conway, K., Diouf, I., Everett, K., Islam, M., Sène, P. I. S., Tasic, H., Wigle, J., & Bhutta, Z. (2020). Drivers of stunting reduction in Senegal: a country case study. *The American Journal of Clinical Nutrition*, 112, 860S–874S. <https://doi.org/10.1093/ajcn/nqaa151>
- Chou, J. L., Pierce, K. J., Pennington, L. B., Seiler, R., Michael, J., Mc Namara, D., & Zand, D. (2018). Social support, family empowerment, substance use, and perceived parenting competency during pregnancy for women with substance use disorders. *Substance Use and Misuse*, 53(13), 2250–2256. <https://doi.org/10.1080/10826084.2018.1467456>
- Christian, A. K., Atiglo, D. Y., Okyere, M. A., Obeng-Dwamena, A., Marquis, G. S., & Jones, A. D. (2023). Women's empowerment, children's nutritional status, and the mediating role of household headship structure: Evidence from sub-Saharan Africa. *Maternal and Child Nutrition*, 19(3). <https://doi.org/10.1111/mcn.13520>
- de Groot, R., Yablonski, J., & Valli, E. (2022). The impact of cash and health insurance on child nutrition during the first 1000 days: Evidence from Ghana. *Food Policy*, 107(July 2020). <https://doi.org/10.1016/j.foodpol.2021.102217>
- Dhollande, S., Taylor, A., Meyer, S., & Scott, M. (2021). Conducting integrative reviews: A guide for novice nursing researchers. *Journal of Research in Nursing*, 26(5), 427–438. <https://doi.org/10.1177/1744987121997907>
- Dibley, M. J., Alam, A., Fahmida, U., Ariawan, I., Titaley, C. R., Htet, M. K., Damayanti, R., Li, M., Sutrisna, A., & Ferguson, E. (2020). Evaluation of a package of behaviour change interventions (baduta program) to improve maternal and child nutrition in east Java, Indonesia: Protocol for an impact study. *JMIR Research Protocols*, 9(9). <https://doi.org/10.2196/18521>
- Egbuonye, N. C., Ishdorj, A., McKyer, E. L. J., & Mkuu, R. (2021). Examining the dietary diversity of children in niger. *Nutrients*, 13(9). <https://doi.org/10.3390/nu13092961>
- Ewerling, F., Lynch, J. W., Victora, C. G., van Eerdewijk, A., Tysler, M., & Barros, A. J. D. (2017). The SWPER index for women's empowerment in Africa: Development and validation of an index based on survey data. *The Lancet Global Health*, 5(9), e916–e923. [https://doi.org/10.1016/S2214-109X\(17\)30292-9](https://doi.org/10.1016/S2214-109X(17)30292-9)
- Gelli, A., Becquey, E., Ganaba, R., Headey, D., Hidrobo, M., Huybregts, L., Verhoef, H., Kenfack, R., Zongouri, S., & Guedenet, H. (2017). Improving diets and nutrition through an integrated poultry value chain and nutrition intervention (SELEVER) in Burkina Faso: Study protocol for a randomized trial. *Trials*, 18(1). <https://doi.org/10.1186/s13063-017-2156-4>
- Gelli, A., Margolies, A., Santacroce, M., Roschnik, N., Twalibu, A., Katundu, M., Moestue, H., Alderman, H., & Ruel, M. (2018). Using a community-based early childhood development center as a platform to promote production and consumption diversity increases children's dietary intake and reduces stunting in Malawi: A cluster-randomized trial. *The Journal of Nutrition*, 148(10), 1587–1597. <https://doi.org/10.1093/jn/nxy148>
- Habtu, M., Agena, A. G., Umugwaneza, M., Mochama, M., & Munyanshiongore, C. (2023). Effect and challenges of an integrated nutrition-intervention package utilization among pregnant women and lactating mothers in Rwanda: An exploratory qualitative study. *Current Developments in Nutrition*, 7(1), 100018. <https://doi.org/10.1016/j.cdnut.2022.100018>
- Heckert, J., Martinez, E. M., Sanou, A., Pedehombga, A., Ganaba, R., & Gelli, A. (2023). Can a gender-sensitive integrated poultry value chain and nutrition intervention increase women's empowerment among the rural poor in Burkina Faso? *Journal of Rural Studies*, 100, 103026. <https://doi.org/10.1016/j.jrurstud.2023.103026>
- Heckert, J., Olney, D. K., & Ruel, M. T. (2019).

- Is women's empowerment a pathway to improving child nutrition outcomes in a nutrition-sensitive agriculture program?: Evidence from a randomized controlled trial in Burkina Faso. *Social Science & Medicine*, 233, 93–102. <https://doi.org/10.1016/j.socscimed.2019.05.016>
- Holland, C., & Rammohan, A. (2019). Rural women's empowerment and children's food and nutrition security in Bangladesh. *World Development*, 124, 104648. <https://doi.org/10.1016/j.worlddev.2019.104648>
- Hong, Q. N., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M. P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M. C., Vedel, I., & Pluye, P. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *Education for Information*, 34(4), 285–291. <https://doi.org/10.3233/EFI-180221>
- Ickes, S. B., Wu, M., Mandel, M. P., & Roberts, A. C. (2018). Associations between social support, psychological well-being, decision making, empowerment, infant and young child feeding, and nutritional status in Ugandan children ages 0 to 24 months. *Maternal & Child Nutrition*, 14(1). <https://doi.org/10.1111/mcn.12483>
- Imai, K. S., Annim, S. K., Kulkarni, V. S., & Gaiha, R. (2014). Women's empowerment and prevalence of stunted and underweight children in Rural India. *World Development*, 62, 88–105. <https://doi.org/10.1016/j.worlddev.2014.05.001>
- Jisso, M., Tesfaye, T., Biadgilign, S., Tareke, A. A., & Zerfu, T. A. (2022). The role of multi-dimensional women's empowerment in agriculture to improve the nutritional status of under-five children in rural cash crop producing, resource-limited settings of Ethiopia. *Journal of Nutritional Science*, 11, 1–9. <https://doi.org/10.1017/jns.2022.86>
- Jones, R., Haardörfer, R., Ramakrishnan, U., Yount, K. M., Miedema, S., & Girard, A. W. (2019). Women's empowerment and child nutrition: The role of intrinsic agency. *SSM - Population Health*, 9(August 2019). <https://doi.org/10.1016/j.ssmph.2019.100475>
- Khalid, H., & Martin, E. G. (2017). Female-headed households associated with lower childhood stunting across culturally diverse Regions of Pakistan: Results from a cross-sectional household survey. *Maternal and Child Health Journal*, 21(10), 1967–1984. <https://doi.org/10.1007/s10995-017-2314-z>
- Kim, S. S., Nguyen, P. H., Yohannes, Y., Abebe, Y., Tharaney, M., Drummond, E., Frongillo, E. A., Ruel, M. T., & Menon, P. (2019). Behavior change interventions delivered through interpersonal communication, agricultural activities, community mobilization, and mass media increase complementary feeding practices and reduce child stunting in Ethiopia. *The Journal of Nutrition*, 149(8), 1470–1481. <https://doi.org/https://doi.org/10.1093/jn/nxz087>
- Komakech, J. J., Walters, C. N., Rakotomanana, H., Hildebrand, D. A., & Stoecker, B. J. (2022). The associations between women's empowerment measures, child growth and dietary diversity: Findings from an analysis of demographic and health surveys of seven countries in Eastern Africa. *Maternal and Child Nutrition*, 18(4). <https://doi.org/10.1111/mcn.13421>
- Kulkarni, S., Frongillo, E. A., Cunningham, K., Moore, S., & Blake, C. E. (2021). Gendered intrahousehold bargaining power is associated with child nutritional status in Nepal. *Journal of Nutrition*, 151(4), 1018–1024. <https://doi.org/10.1093/jn/nxaa399>
- Malapit, H. J. L., & Quisumbing, A. R. (2015). What dimensions of women's empowerment in agriculture matter for nutrition in Ghana? *Food Policy*, 52, 54–63. <https://doi.org/10.1016/j.foodpol.2015.02.003>
- Matare, C. R., Mbuya, M. N., Dickin, K. L., Constat, M. A., Pelto, G., Chasekwa, B., Humphrey, J. H., & Stoltzfus, R. J. (2021). Maternal capabilities are associated with child caregiving behaviors among women in Rural Zimbabwe. *The Journal of Nutrition*, 151(3), 685–694. <https://doi.org/10.1093/jn/nxaa255>
- McKenna, C. G., Bartels, S. A., Pablo, L. A., & Walker, M. (2019). Women's decision-making power and undernutrition in their children under age five in the Democratic Republic of the Congo: A cross-sectional study. *PLoS ONE*, 14(12), 1–19. <https://doi.org/10.1371/journal.pone.0226041>
- Mekonnen, A. G., Odo, D. B., Nigatu, D., Sav, A., & Abagero, K. K. (2021). Women's empowerment and child growth faltering in Ethiopia: Evidence from the Demographic and Health Survey. *BMC Women's Health*, 21(1). <https://doi.org/10.1186/s12905-021-01183-x>
- Mendoza Vela, A. L. (2025). Revisiones sistemáticas más inclusivas: El valor de las bases regionales y abiertas en la investigación latinoamericana. Una revisión crítica. *Revista Multidisciplinar Epistemología de Las Ciencias*, 2(3), 1978–2003. <https://doi.org/10.71112/ztmrws65>
- Ministry of Health Republic of Indonesia. (2018). Buletin stunting. *Kementerian Kesehatan RI*, 301(5), 1163–1178.
- Nick, J. M., & Sarpy, N. L. (2022). An analysis of data sources and study registries used in systematic reviews. *Worldviews on Evidence-Based Nursing*, 19(6), 450–457. <https://doi.org/10.1111/wvn.12614>
- Nsiah-Asamoah, C., Adjei, G., Agblorti, S., & Doku, D. T. (2022). Association of maternal characteristics with child feeding indicators and nutritional status of children under-two years in Rural Ghana. *BMC Pediatrics*, 22(1), 1–16. <https://doi.org/10.1186/s12887-022-03651-1>

Indanah, I., et al. (2026)

- Nursalam, N., Utami, S., & Susilaningrum, R. (2021). Analysis Of Factors Affecting Commitment And Ability Of Families To Early Detection In Stunting. *Jurnal Keperawatan Padjadjaran*, 9(3), 190-198. <https://doi.org/10.24198/jkp.v9i3.1722>
- Olney, D. K., Pedehombga, A., Ruel, M. T., & Dillon, A. (2015). A 2-year integrated agriculture and nutrition and health behavior change communication program targeted to women in burkina faso reduces anemia, wasting, and diarrhea in children 3–12.9 months of age at baseline: A cluster-randomized controlled trial. *The Journal of Nutrition*, 145(6), 1317–1324. <https://doi.org/10.3945/jn.114.203539>
- Onah, M. N. (2021). Women's empowerment and child nutrition in South-Central Asia; how important is socioeconomic status? *SSM - Population Health*, 13, 100718. <https://doi.org/10.1016/j.ssmph.2020.100718>
- P., S., & Bansal, A. (2022). Is mother's financial autonomy associated with stunting among children aged 7–35 months: An empirical study from India. *PLoS Global Public Health*, 2(1), e0000134. <https://doi.org/10.1371/journal.pgph.0000134>
- Paul, P., & Saha, R. (2022). Is maternal autonomy associated with child nutritional status? Evidence from a cross-sectional study in India. *PLoS ONE*, 17(5 May). <https://doi.org/10.1371/journal.pone.0268126>
- Poudel, S., Adhikari, C., Yadav, R. K., Yadav, D. K., Thapa, D. K., & Jakovljevic, M. (2022). Disempowered mothers have undernourished children: How strong is the intrinsic agency? *Frontiers in Public Health*, 10(February), 1–8. <https://doi.org/10.3389/fpubh.2022.817717>
- Quisumbing, A. R., Sproule, K., Martinez, E. M., & Malapit, H. (2021). Do tradeoffs among dimensions of women's empowerment and nutrition outcomes exist? Evidence from six countries in Africa and Asia. *Food Policy*, 100, 102001. <https://doi.org/10.1016/j.foodpol.2020.102001>
- Rahayuwati, L., Indra Yani, D., Suzy Setiawan, A., & Oruga, M. D. (2023). Transdisciplinary approach to prevent stunting in Indonesia. *Jurnal Keperawatan Padjadjaran*, 11(2), 77–80. <https://doi.org/10.24198/jkp.v11i2.2295>
- Saadah, N., Hasanah, U., & Yulianto, B. (2022). Mother empowerment model in stunting prevention and intervention through stunting early detection training. *Open Access Macedonian Journal of Medical Sciences*, 10(G), 649–655. <https://doi.org/10.3889/oamjms.2022.8759>
- Santoso, M. V., Bezner Kerr, R. N., Kassim, N., Martin, H., Mtinda, E., Njau, P., Mtei, K., Hoddinott, J., & Young, S. L. (2021). A nutrition-sensitive agroecology intervention in Rural Tanzania increases children's dietary diversity and household food security but does not change child anthropometry: Results from a cluster-randomized trial. *The Journal of Nutrition*, 151(7), 2010–2021. <https://doi.org/https://doi.org/10.1093/jn/nxab052>
- Sey-Sawo, J., Sarr, F., Bah, H. T., & Senghore, T. (2023). Women's empowerment and nutritional status of children in the Gambia: Further analysis of the 2020 Gambia demographic and health survey. *BMC Public Health*, 23(1), 1–13. <https://doi.org/10.1186/s12889-023-15494-1>
- Sharma, A. J., & Subramanyam, M. A. (2021). Intersectional role of paternal gender-equitable attitudes and maternal empowerment in child undernutrition: A cross-sectional national study from India. *BMJ Open*, 11(8), 1–7. <https://doi.org/10.1136/bmjopen-2020-047276>
- Simanjuntak, B. Y. (2018). Early initiation of breastfeeding and vitamin a supplementation with nutritional status of children under five years (6-59 Months). *Kesmas: National Public Health Journal*, 12(3). <https://doi.org/10.21109/kesmas.v12i3.1747>
- Sraboni, E., Malapit, H. J., Quisumbing, A. R., & Ahmed, A. U. (2014). Women's empowerment in agriculture: What role for food security in Bangladesh? *World Development*, 61, 11–52. <https://doi.org/10.1016/j.worlddev.2014.03.025>
- Tasic, H., Akseer, N., Gebreyesus, S. H., Ataullahjan, A., Brar, S., Confreda, E., Conway, K., Endris, B. S., Islam, M., Keats, E., Mohammedsanni, A., Wigle, J., & Bhutta, Z. A. (2020). Drivers of stunting reduction in Ethiopia: a country case study. *The American Journal of Clinical Nutrition*, 112, 875S–893S. <https://doi.org/https://doi.org/10.1093/ajcn/nqaa163>
- Tchakounté Tchumi, D. (2023). Does maternal empowerment influence childhood stunting and wasting in Cameroon? A cross-sectional study. *Vulnerable Children and Youth Studies*, 18(2), 263–281. <https://doi.org/10.1080/17450128.2022.2141405>
- Terfa, Z. G., Ahmed, S., Khan, J., & Niessen, L. W. (2022). Household microenvironment and under-fives health outcomes in uganda: focusing on multidimensional energy poverty and women empowerment indices. *International Journal of Environmental Research and Public Health*, 19(11), 6684. <https://doi.org/10.3390/ijerph19116684>
- Tesfaye, A., & Egata, G. (2022). Stunting and associated factors among children aged 6–59 months from productive safety net program beneficiary and non-beneficiary households in Meta District, East Hararghe zone, Eastern Ethiopia: A comparative cross-sectional study. *Journal of Health, Population and Nutrition*, 41(1), 13. <https://doi.org/10.1186/s41043-022-00291-0>
- Tome, J., Mbuya, M. N. N., Makasi, R. R., Ntozini, R., Prendergast, A. J., Dickin, K. L., Pelto, G. H., Constan, M. A., Moulton, L. H., Stoltzfus, R. J., Humphrey, J. H., & Matare, C. R. (2021).

- Maternal caregiving capabilities are associated with child linear growth in rural Zimbabwe. *Maternal and Child Nutrition*, 17(2), 1–12. <https://doi.org/10.1111/mcn.13122>
- Walters, C. N., Rakotomanana, H., Komakech, J. J., & Stoecker, B. J. (2019). Maternal determinants of optimal breastfeeding and complementary feeding and their association with child undernutrition in Malawi (2015–2016). *BMC Public Health*, 19(1), 1503. <https://doi.org/10.1186/s12889-019-7877-8>
- Wood, E. A., Wilson, K. E., & Jacobs, K. D. (2021). Exploring the differences between men's and women's perceptions of gender-based violence in rural Tajikistan: A qualitative study. *BMC Women's Health*, 21(1), 1–15. <https://doi.org/10.1186/s12905-021-01227-2>
- World Health Organization. (2018). Reducing stunting in children equity considerations for achieving the global nutrition targets 2025.
- Yaya, S., Odusina, E. K., Uthman, O. A., & Bishwajit, G. (2020). What does women's empowerment have to do with malnutrition in Sub-Saharan Africa? Evidence from demographic and health surveys from 30 countries. *Global Health Research and Policy*, 5, 1. <https://doi.org/10.1186/s41256-019-0129-8>

Interventions to reduce anxiety among college students In Indonesia: A scoping review

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Abstract

Background: Anxiety among college students is a growing mental health concern, particularly in Indonesia, where students face academic pressure, challenges related to academic major selection, performance demands, transition to adulthood, and career uncertainty. These stressors are compounded by limited access to formal psychological services, mental health stigma, and financial barriers, resulting in a substantial treatment gap.

Purpose: To identify and map evidence-based interventions used to reduce anxiety and psychological distress among college students in Indonesia across various academic majors and fields of study.

Methods: This scoping review followed the Population–Concept–Context (PCC) framework. Relevant studies were identified through PubMed, Scopus, CINAHL, and Google Scholar using keywords related to intervention, anxiety, college students, and Indonesia. Studies were included if they involved college student populations, examined interventions targeting anxiety or psychological distress, and were published in Indonesian or English.

Results: The database search yielded 269 reports. After title, abstract, and full-text screening, 15 studies met the inclusion criteria and were included in the final analysis. Five key themes emerged: (1) a predominant focus on academic-related anxiety; (2) dominance of Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), and mindfulness-based interventions; (3) benefits of brief relaxation, art-based, and expressive approaches; (4) feasibility of digital, counselor-guided, and culturally adapted programs, including Self-Help Plus; and (5) the use of efficient, mostly quasi-experimental designs with short intervention durations. Overall, the interventions demonstrated reductions in anxiety and psychological distress among college students.

Conclusions: Reducing anxiety among college students in Indonesia requires a multimodal and holistic approach that integrates evidence-based psychological therapies with culturally responsive and accessible strategies. The growing use of brief, digital, and culturally adapted interventions offers a promising pathway to address mental health service gaps in Indonesian higher education.

Keywords: anxiety; college students; Indonesia; intervention; reduce; scoping review

Introduction

In the academic and social spheres, pupils and students often face various challenges that can trigger anxiety. This anxiety is not only temporary but can have a long-term impact on their mental health (Efsthathiou et al., 2025). This condition is exacerbated by academic pressure, social pressure, and the transition to a more independent phase of life, making anxiety a crucial issue that needs to be taken seriously (Joheshi et al., 2025). Anxiety is an emotional experience that arises due to a threat that has no clear cause, either originating from outside or within the individual when carrying out

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various tasks and activities in academic situations (Mohamed et al., 2024).

Epidemiological data demonstrate that anxiety is a prevalent mental health concern among young adults and student populations. A survey conducted by the American College Health Association (2022) reported that 25.9% of college students experienced anxiety, while 31.9% reported high levels of stress. Based on the Indonesian Health Survey (SKI) 2023, the prevalence of mental health problems among individuals aged ≥ 15 years was approximately 2.0%, as measured using the Self-Reporting Questionnaire-20 (SRQ-20). In the same survey, the prevalence of depression in the general population aged ≥ 15 years was reported to be 1.4%, with variations across age groups and regions (Kemenkes RI, 2023). Anxiety was common among college students, with 25% reporting mild anxiety, 60% moderate anxiety, and 15% severe anxiety, highlighting the relevance of anxiety as a significant issue within higher education settings (Suyanto et al., 2019). A meta-analysis of 121 studies reported that nursing students commonly experienced mild to moderate anxiety, with pooled prevalence estimates ranging approximately 19.4% to 25.1% across diverse educational settings (Vo et al., 2023). In a cross-sectional survey of 247 nursing students in Indonesia during the COVID-19 pandemic, 35.3% of participants exhibited mild to severe anxiety symptoms as assessed by standardized measures (Zukhra et al., 2021).

Anxiety among college students has wide-ranging consequences that extend beyond emotional distress and directly affect academic functioning and daily life. Students experiencing anxiety often encounter difficulties in maintaining concentration and motivation, which may negatively influence academic performance and participation in social activities (Yazici & Ökten, 2022). Persistent anxiety can also contribute to social withdrawal and increase vulnerability to depressive symptoms (Savitsky et al., 2023). Furthermore, anxiety is frequently associated with disruptions in sleep and eating patterns, leading to additional physical health concerns (Hikmat et al., 2025). These interconnected effects emphasize the need for intervention strategies that not only alleviate anxiety symptoms but also promote students' overall psychological and physical well-being in a comprehensive manner (Lin et al., 2020).

Various interventions have been developed to reduce anxiety in college students, including counseling, cognitive behavioral therapy, and relaxation and mindfulness programs (Yosep et al., 2023). Interventions to reduce anxiety in college students include a variety of approaches designed to address the causes and manifestations of anxiety in the academic environment. These approaches may take the form of psychological therapy, such as cognitive behavioral therapy (CBT), which helps students identify and challenge negative thought patterns that contribute to their anxiety (Simsek-

Cetinkaya & Cakir, 2023). Stress management programs and relaxation techniques, such as mindfulness and meditation, have also been shown to be effective in reducing anxiety levels by increasing mental awareness and presence (Amira et al., 2021). Additionally, interventions can include peer support and mentoring programs, which provide a space for students to share experiences and coping strategies, as well as strengthen their social support networks.

A literature review of interventions to reduce anxiety in college students is a crucial step in understanding the effectiveness of various intervention strategies and identifying areas that require further research. This literature review allows the aim of evaluating the existing evidence regarding different approaches, ensuring that the interventions implemented are based on best practices supported by empirical research. This makes the author interested in conducting a literature review regarding interventions to reduce anxiety in students.

Materials and Methods

Design

This study employed a scoping review design to comprehensively map the literature on interventions aimed at reducing anxiety in college students (Arksey & O'Malley, 2005). The scoping review method was chosen because it allows the reviewer to broadly map and synthesize the available literature, including identifying types of evidence, uncovering gaps in research, and determining the extent of research progress in the area of college student mental health interventions. This scoping review was specifically designed to explore and categorize various interventions that have been tested for their effectiveness in reducing anxiety among college students.

Search Strategy and Eligibility Criteria

The search strategy was developed systematically based on the PCC (Population, Concept, Context) framework. Within this framework, the study focuses on college students as the target population, as this group faces unique academic, developmental, and psychosocial challenges that increase vulnerability to anxiety. The concepts sought are various psychological or psychoeducational interventions, and the context is anxiety reduction efforts. The literature search was conducted through leading scientific databases, namely Scopus, CINAHL, and PubMed, expanded by the use of the academic search engine Google Scholar. The primary keywords used in the search were a combination of "interventions," "anxiety," and "students." (See Supplementary File 1).

The inclusion criteria for this scoping review stipulated that studies must address interventions to reduce anxiety in college students, be written in English or Indonesian, and be published in a peer-reviewed journal. Furthermore, the studies must

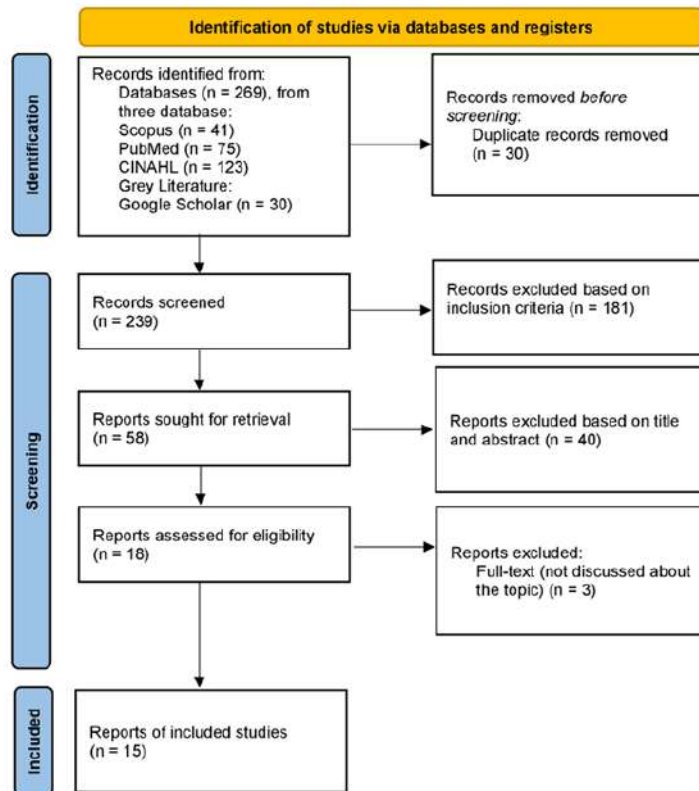


Figure 1. PRISMA Flow Diagram

be specifically conducted in Indonesia to ensure contextual relevance. Studies must be published between 2014 and 2025. Conversely, exclusion criteria included studies not focused on college students, as well as non-empirical reports such as editorials or commentaries. The application of these inclusion and exclusion criteria aimed to ensure that the scoping review focused only on the most relevant and high-quality evidence. The overall results of the article search process are reported using the PRISMA flowchart (Figure 1).

Data Extraction

The data extraction process followed a standard scoping review protocol. After initial identification of articles through database searches, two reviewers independently screened titles and abstracts to determine study eligibility. Studies meeting the eligibility criteria were subjected to full-text review. Information extracted from selected studies included key details such as sample details, study design and methods, description of the interventions implemented, outcomes measured, and key study conclusions. This extraction step was crucial to ensure that all relevant data was carefully collected before in-depth analysis.

Data Analysis

Data analysis was conducted through a thematic narrative synthesis of the findings from the selected studies. This approach allowed researchers to holistically integrate qualitative and quantitative

data, resulting in a comprehensive overview of the various interventions used to reduce anxiety in college students. This narrative analysis involved several stages, including extracting key themes dominant in the literature, identifying patterns and methodological gaps in the research, and synthesizing the effectiveness of the interventions (Arksey & O'Malley, 2005).

Results

Study selection

Records were identified from databases (n = 269; Scopus = 41, PubMed = 75, CINAHL = 123) and grey literature via Google Scholar (n = 30). After removing duplicates (n = 30), 239 records were screened. 181 were excluded by inclusion criteria, leaving 58 reports sought for retrieval. Title and abstract screening excluded 40, so 18 full texts were assessed. 3 full texts were off-topic, yielding 15 included studies.

Included evidence

The 15 studies examined CBT/third-wave approaches, brief relaxation and expressive methods, and culturally adapted digital programs. All reported reductions in academic anxiety or psychological distress. In completed empirical studies, sample sizes ranged from 6 to 72 students; planned RCTs reported target enrolments up to 296 (see Table 1).

Based on the 15 articles analyzed, research on

Table 1. Characteristics of Included Study

Authors, Year	Objective	Design	Sample	Intervention	Results
I. Cognitive Behavioral Therapy (CBT)					
(Grahata-ma et al., 2022)	The effectiveness of group CBT in reducing anxiety in students procrastinating on their thesis.	Quasi-Experiment (Non-equivalent Control Group).	10 students.	Group CBT (based on the intervention model of Bieling et al., 2006). Consisting of several group sessions with a focus on cognitive restructuring and behavioral changes related to procrastination.	Group CBT is effective in reducing anxiety students by 45% (significant decrease).
(Luzanil & Menaldi, 2021)	Effectiveness of Group CBT to reduce worry in out-of-town students with academic anxiety.	Descriptive with pre-post measurements.	6 students from out of town.	Group CBT delivered via teleconference over 5 sessions. Focused on identifying and modifying thought patterns that trigger academic anxiety.	There was a significant decrease in worry.
(Machmudati & Diana, 2017)	The effectiveness of positive thinking training in reducing anxiety when writing a thesis.	Pre-test Post-test Control Group Design.	24 students (12 Experimental, 12 Control) with moderate-high anxiety.	Positive Thinking Training (consisting of structured sessions, focusing on optimism training and changing pessimistic explanatory styles). Duration is not specific.	There was a significant decrease in anxiety scores in the experimental group ($p=0.002$).
(Bahiyah et al., 2024)	To determine if positive thinking therapy or positive affirmations can reduce anxiety levels and increase relaxation and self-confidence among students.	Quantitative experimental research using a One-Group Pre-test-Posttest Design.	20 third-semester psychology students from Raden Fatah Islamic University (17 females, 3 males) who screened high for anxiety.	Positive Thinking Therapy, which involves filling the mind with positive content and affirmations to counter negative thoughts.	The therapy was effective in reducing anxiety levels, with 19 out of 20 participants showing a decrease in scores. Statistical analysis (Paired Sample T-test) confirmed a significant decrease with a p -value < 0.001 .
(Adrian-syah et al., 2017)	Reduction in career anxiety in students after being given Positive Thinking, CBT, and MHMMD therapy.	Quasi-Experiment (comparing 3 treatments).	45 students with high levels of career anxiety.	Divided into 3 groups, each receiving: (1) Positive Thinking Therapy, (2) CBT, or (3) Life Management and Future Planning Training (MHMMD).	CBT($\text{sig}=0.048$) and MHMMD Training ($\text{sig}=0.002$) significantly reduced career anxiety.
(Sari et al., 2021)	The effect of thought stopping on reducing anxiety in students writing theses.	Pre-test Post-test Control Group Design.	Students who are writing their thesis.	Thought Stopping: Train clients to cut off disturbing thoughts (such as worrying about failing their thesis) by saying 'stop' and immediately replacing them with positive thoughts.	The experimental group experienced a significant decrease in anxiety ($p=0.009$).

Cont. Table 1. Characteristics of Included Study

Authors, Year	Objective	Design	Sample	Intervention	Results
II. Relaxation, Mindfulness, & Art Interventions					
(Rinera & Retnowati, 2020)	The effect of Mindfulness Based Stress Reduction (MBSR) training on anxiety in new students.	Experimental (Untreated Control Group).	16 new students.	MBSR training, consisting of eight sessions over eight weeks, is conducted by trained facilitators and includes both formal and informal meditation techniques (such as body scans and sitting meditation).	MBSR training can significantly reduce the anxiety level of new students ($P=0.001$).
(Hidayat, 2018)	The effect of progressive relaxation therapy on reducing anxiety levels when facing student competency tests.	Quasi Experimental Pre-Post Test with Control Group.	72 third-year students of AKPER.	Progressive Relaxation Therapy. Clients are trained to systematically tense and relax muscle groups. The duration and frequency are determined by the researcher/therapist.	There is a significant effect of progressive relaxation therapy on reducing anxiety levels ($p<0.05$).
(Listiyandini et al., 2024)	Feasibility, acceptability, and mental health outcomes of a culturally adapted internet-based mindfulness intervention.	Open Pilot Trial (Single arm Pre-post-test).	40 Indonesian students with high distress.	Internet-Based Mindfulness Intervention for 4 weeks (including mindfulness modules accessible online). The intervention was guided by a counselor through online communication.	The intervention was feasible and acceptable. There was a significant improvement in well-being and a decrease in distress.
(Faradina et al., 2019)	The effect of coloring mandalas on reducing anxiety in students.	Quasi Experiment Pre-test Post-test Control Group.	20 students.	Mandala Coloring (Experimental Group). Participants were given mandala pattern paper and asked to color it according to instructions.	There is a significant effect of coloring mandalas on reducing anxiety ($p=0.005$).
(Pujiati et al., 2022)	The effect of laughter therapy on the anxiety levels of final year students in writing their theses.	Pre-test Post-test Control Group Design.	Final year student of Flora Health College.	Laughter Therapy. Given for 30 minutes, with the aim of triggering the release of endorphins. Conducted by researchers.	There is a significant influence of laughter therapy on reducing the level of thesis anxiety ($p=0.000$).

interventions for anxiety and psychological distress in college students in Indonesia concentrated on five main interrelated themes. After the data extraction process, the characteristics of the included studies were mapped to identify patterns across intervention targets, theoretical approaches, delivery formats, and methodological characteristics. The mapping revealed several recurring patterns. First, most studies focused on academic-related anxiety, particularly anxiety associated with thesis writing and academic performance. Second, many interventions were derived from cognitive-behavioral frameworks, including traditional CBT and emerging third-wave approaches such as mindfulness and ACT. Third,

several studies implemented brief experiential or expressive interventions, such as relaxation techniques, mandala coloring, and laughter therapy. In addition, more recent studies emphasized digital delivery formats and culturally adapted programs to increase accessibility. Finally, methodological patterns indicated that most studies used quasi-experimental pre-post designs with relatively small samples, with newer studies proposing larger randomized controlled trials. Based on this evidence mapping, five interrelated themes were identified to synthesize the current landscape of intervention research for anxiety and psychological distress among college students in Indonesia.

Cont. Table 1. Characteristics of Included Study

Authors, Year	Objective	Design	Sample	Intervention	Results
III. Feasibility Study & Latest Research Protocol					
(Gunawan & Oriza, 2023)	Assessing the feasibility of Acceptance and Commitment Therapy (ACT) in a group setting to increase self-efficacy in college students with social anxiety.	Feasibility Study.	Students with social anxiety.	ACT Group (replicating the module from Fleming & Kocovski, 2014) consists of 4 sessions with a 1 week break between sessions.	The research focuses on the feasibility of implementing ACT in groups.
(Rahmadiana et al., 2019)	Pilot Trial Protocol: Assessing the feasibility and acceptability of a culturally adapted internet-based transdiagnostic intervention.	Pilot Test Protocol.	50 students with mild to moderate depression or anxiety.	Internet-Based Transdiagnostic Intervention (8 online sessions). The intervention is guided by a therapist/facilitator to increase adherence.	Research Protocol to guide future randomized controlled trials (RCTs).
(Andriani et al., 2025)	RCT Protocol: Assessing the effectiveness and cost-effectiveness of Self-Help Plus (SH+) for reducing psychological distress.	Randomized Controlled Trial (RCT) Protocol.	296 Indonesian students with symptoms of psychological distress.	Self-Help Plus (SH+): A guided group-based stress management intervention developed by WHO and adapted culturally.	Research Protocol (to test effectiveness and cost effectiveness).
(Yan et al., 2025)	RCT Protocol: Investigating the effects of a brief 14-day online mindfulness intervention on reducing stress, anxiety, depression, and RNT.	Randomized Controlled Trial (RCT) Protocol.	Indonesian undergraduate students.	Brief Online Mindfulness Intervention for 14 days. Compared with psychoeducational and waitlist conditions.	Research Protocol (The results are expected to provide evidence of the effectiveness of a brief online mindfulness intervention).

Theme 1: Academic Anxiety as a Primary Intervention Target

The majority of studies identify academic anxiety as a major problem among college students. Research specifically targets anxiety related to thesis writing (Grahatama et al., 2022; Machmudati & Diana, 2017; Pujiati et al., 2022; Sari et al., 2021), which is often exacerbated by issues such as procrastination (Grahatama et al., 2022). Furthermore, research also addresses anxiety related to career demands and transitions, such as freshman anxiety (Rinera & Retnowati, 2020) and competency test anxiety (Hidayat, 2018). For instance, third-semester psychology students have been identified as a vulnerable group experiencing these pressures during their academic progression (Bahiyah et al., 2024). This sharp focus on academic issues suggests that the Indonesian higher education environment creates unique pressures and requires contextual solutions.

Theme 2: The Dominance of the Cognitive-Behavioral Approach (CBT) and Its Development

The most widely tested interventions are derived from the theoretical frameworks of CBT and Third Wave Therapy. Cognitive Behavioral Therapy (CBT), both in individual and group formats, has been shown to be effective in reducing general anxiety (Adriansyah et al., 2017), career anxiety, and academic worry (Luzanil & Menaldi, 2021). The cognitive component of these interventions has also been explored separately, with Positive Thinking Training (Machmudati & Diana, 2017) and specific techniques such as Thought Stopping (Sari et al., 2021) demonstrating significant effectiveness in breaking the cycle of negative rumination. Progress toward the Third Wave is demonstrated by testing the effectiveness of Mindfulness-Based Stress Reduction (MBSR) (Rinera & Retnowati, 2020) and assessing the feasibility of Acceptance and Commitment Therapy (ACT) in a group setting

for social anxiety (Gunawan & Oriza, 2023). The efficacy of cognitive components is further supported by research on Positive Thinking Therapy, which successfully reduced anxiety levels in the majority of participants by replacing negative rumination with positive affirmations. While this therapy is effective independently ($p < 0.001$), it is suggested to be even more powerful when juxtaposed with Cognitive Behavioral Therapy (CBT) to maximize results, particularly for students experiencing severe or very severe anxiety (Bahiyah et al., 2024).

Theme 3: Effectiveness of Brief Relaxation, Arts, and Expressive Interventions

Several studies provide strong evidence that simple, non-formal psychotherapeutic interventions focused on somatic experiences can be powerful tools. Progressive Relaxation Therapy (Hidayat, 2018) effectively reduces anxiety by targeting physical tension. Furthermore, interventions involving creative expression or the release of positive emotions, such as Mandala Coloring (Faradina et al., 2019) and Laughter Therapy (Pujiati et al., 2022), have been statistically proven to reduce anxiety. These findings suggest that easily accepted and enjoyable interventions could be a first-line option to reduce stigma for students who are reluctant to seek more intensive psychological help.

Theme 4: Future Trends: Digital Accessibility and Cultural Adaptation

More recent research suggests a strategic focus on increasing access to mental health services through technology. A counselor-led, internet-based mindfulness intervention demonstrated high feasibility and acceptability, as well as positive outcomes in reducing psychological distress (Listiyandini et al., 2024). This trend is reinforced by a large number of randomized controlled trial (RCT) protocols (Andriani et al., 2025; Rahmadiana et al., 2019; Yan et al., 2025) that plan to systematically test digital and group-based interventions. These protocols explicitly emphasize the importance of cultural adaptation (Andriani et al., 2025; Rahmadiana et al., 2019) to ensure global interventions, such as Self-Help Plus (SH+), are relevant and acceptable in the Indonesian context.

Theme 5: Characteristics of Intervention Methodology and Efforts for Efficiency

The majority of studies used a Quasi-Experimental Pre-test Post-test Control Group design, which is a practical option for testing effectiveness in educational settings (Faradina et al., 2019; Hidayat, 2018). In terms of duration, there is a clear effort to improve efficiency. While classic interventions such as MBSR require 8 weeks (Rinera & Retnowati, 2020), many studies tested shorter interventions: 5-session group CBT (Luzanil & Menaldi, 2021), 4-session ACT (Gunawan & Oriza, 2023), or even digital interventions lasting only 4 weeks (Listiyandini et al., 2024) to 14 days (Yan et al.,

2025), demonstrating the drive to develop solutions that are fast, efficient, and fit students' busy academic schedules.

Discussion

Interventions found included Cognitive Behavioral Therapy (CBT), positive thinking, mandala coloring, laughter therapy, and progressive muscle relaxation. CBT interventions focus on cognitive restructuring to help students process and cope with psychological stress caused by academic anxiety (Grahatama et al., 2022; Luzanil & Menaldi, 2021). Positive thinking, which directs individuals to focus on the positive aspects of their situation, is helpful in reducing negative thoughts that contribute to anxiety (Zhang et al., 2024). Mandala coloring is also considered a form of active meditation, so it can provide an opportunity to calm the mind and reduce stress (Faradina et al., 2019). Laughter, as a form of natural therapy, can stimulate the release of endorphins, which improve mood (Pujiati et al., 2022). Furthermore, progressive muscle relaxation, which uses a technique of sequentially tensing and relaxing muscles, can help reduce physical tension often associated with anxiety (Hidayat, 2018).

The analysis found that a wide range of interventions have been reported to be associated with reductions in anxiety among college students across the included studies. Cognitive-based interventions, such as Cognitive Behavioral Therapy (CBT) and thought stopping, were frequently described as helping students develop more adaptive coping strategies for managing academic and emotional stress (Luzanil & Menaldi, 2021; Sari et al., 2021). Interventions promoting positive thinking were commonly linked to improvements in emotional regulation and perceived psychological well-being (Ross et al., 2025). In addition, expressive and relaxation-based activities, including coloring (Faradina et al., 2019) and laughter therapy, were described as contributing to decreased self-reported anxiety levels (Pujiati et al., 2022). Progressive muscle relaxation was also identified as an intervention frequently used to address the physical manifestations of anxiety, particularly in examination-related contexts (Hidayat, 2018). Overall, the findings highlight the diversity of intervention approaches applied to manage academic anxiety rather than establishing their comparative or statistical effectiveness.

Factors influencing the effectiveness of anxiety-reduction interventions include the suitability of the intervention type to individual needs and preferences, the intensity and duration of the intervention, and the context in which the intervention is implemented (Primasari et al., 2025). In the Indonesian context, particularly for internet-based and digitally delivered interventions, counselor guidance and cultural adaptation play a critical role in supporting engagement and ensuring that intervention content is perceived as relevant and acceptable to students'

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cultural values and daily experiences (Irawan et al., 2024; Listiyandini et al., 2024). In addition, social support from family members, peers, and educational institutions can strengthen intervention outcomes by fostering motivation, emotional safety, and sustained participation (Yosep et al., 2024).

Students' openness and willingness to engage in interventions represent key individual-level factors that influence intervention success (Mohamed et al., 2024). Openness refers to students' readiness to acknowledge psychological distress, reduce stigma-related resistance, and accept mental health support, while willingness reflects their motivation to actively participate in the intervention process (Liu et al., 2024). This includes consistent attendance, completion of assigned exercises or self-help activities, responsiveness to counselor guidance, and the application of learned coping strategies in academic and social situations (Wang et al., 2022). When students demonstrate high levels of openness and willingness, interventions are more likely to be implemented as intended and to produce meaningful reductions in anxiety (Onieva-Zafra et al., 2020). Therefore, fostering these attitudes is essential for maximizing the effectiveness of anxiety-reduction interventions among college students.

Implemented interventions have a broad impact on students' mental health, not only reducing anxiety but also improving other aspects such as emotional well-being and stress resilience (Listiyandini et al., 2024). Mindfulness-based interventions such as MBSR (Rinera & Retnowati, 2020) have been shown to increase self-awareness, which contributes to increased self-efficacy and psychological flexibility (Gunawan & Oriza, 2023). Positive thinking interventions have shown significant benefits, not only in reducing anxiety levels but also in promoting a healthier mental attitude, which can help students face academic and personal challenges (Laker et al., 2022). Various interventions, from CBT to laughter therapy, have been shown to be effective in reducing anxiety among students in Indonesia (Grande et al., 2022). Therefore, higher education institutions and mental health practitioners in Indonesia are advised to implement and support these interventions as part of a comprehensive mental health strategy for students.

Studies in Indonesia also reflect a global trend in bridging the mental health treatment gap through innovative and scalable solutions. Trial protocols focused on guided, internet-based interventions (da Silva et al., 2022; Listiyandini et al., 2024; Yan et al., 2025) are a direct response to the high costs, social stigma, and limited availability of mental health professionals in low- and middle-income countries (LMICs). Digital interventions enable service delivery to a broader and more anonymous student population, addressing psychological barriers to seeking help (El-Monshed et al., 2022). The testing of Self-Help Plus (SH+) (Andriani et al., 2025), an intervention developed by the WHO, demonstrates institutional commitment to adopting and adapting

evidence-based stress management programs to the specific needs of Indonesian students. The future success of implementing these interventions will depend largely on the effectiveness of cultural adaptation and its cost-effectiveness compared to standard care.

Indonesian cultural and social context plays a central role in how anxiety manifests and interventions are received. The phenomenon of high anxiety among out-of-town students (Luzanil & Menaldi, 2021) highlights profound adaptation challenges beyond family support, where social pressures to succeed and maintain family honor (face-saving) may exacerbate distress. On the other hand, adaptations of global interventions such as Mindfulness (Listiyandini et al., 2024) and SH+ (Andriani et al., 2025) explicitly require adjustments to accommodate strong collectivist and religious values. Group-based interventions may be preferred and effective in cultures that value togetherness and social support (Andriani et al., 2025), while interventions such as coloring and laughter therapy may be successful because they are non-invasive and do not require deep emotional disclosure, which may conflict with norms of politeness or avoid the social stigma attached to mental illness.

The analysis of the included studies suggests that various intervention approaches have been described as beneficial in supporting college students' efforts to manage anxiety. Expressive writing interventions were frequently discussed as helping students process academic and emotional stress by encouraging emotional expression and cognitive organization (Hikmat et al., 2025). Similarly, approaches that promote positive thinking were associated with improved emotional regulation and a more adaptive psychological outlook (Simpson & Sawatzky, 2020). Creative and affective activities, such as coloring and laughter-based interventions, were commonly reported as facilitating relaxation and reducing perceived anxiety by creating a positive emotional state (Vo et al., 2023). In addition, progressive muscle relaxation was highlighted as an approach aimed at alleviating the somatic manifestations of anxiety, particularly tension-related symptoms (Simsek-Cetinkaya & Cakir, 2023). Collectively, these findings underscore the relevance of diverse coping-oriented strategies in addressing academic anxiety, rather than demonstrating definitive or comparative intervention effectiveness.

Factors that influence the effectiveness of interventions include the match between the type of intervention and individual preferences, the intensity and duration of the intervention, and the environment in which the intervention is implemented (El-Monshed et al., 2022; Robertson et al., 2021). Students' openness and willingness to be involved in the intervention also plays an important role. Additionally, social support from family, friends, and educational institutions increases the benefits of the intervention. A holistic and personalized approach

is important for interventions to be more effective in reducing student anxiety (Hamaideh et al., 2022).

The interventions implemented have a broad impact on students' mental health, not only reducing anxiety but also improving other aspects of mental health such as self-confidence, emotional well-being, and resilience to stress (Deliviana et al., 2021; Rahmawati, 2021). Positive thinking interventions have shown significant benefits, not only in reducing anxiety levels but also in promoting a healthier mental attitude, which can help students face academic and personal challenges (Khaira et al., 2023; Lee & Park, 2023).

Various interventions, namely expressive writing, positive thinking, coloring, laughing, and progressive muscle relaxation, have been proven effective in reducing anxiety among students in Indonesia. The importance of selecting interventions that suit individual needs, along with adequate social support, is key in overcoming academic anxiety (Amira et al., 2021). Therefore, higher education institutions and mental health practitioners in Indonesia are advised to implement and support these various interventions as part of a comprehensive mental health strategy for students.

Conclusions

This study explores a variety of interventions proven effective in reducing academic anxiety among college students in Indonesia. Successful interventions can be categorized into two main types: structured, evidence-based therapies, such as Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), and Mindfulness-Based Interventions (MBSR); and simple, expressive strategies with high acceptance, such as positive thinking, laughter therapy, mandala coloring, and progressive muscle relaxation. The effectiveness of these interventions confirms that coping strategies that stimulate positive emotional and physical responses are powerful tools for addressing academic stress. Furthermore, research trends point to a crucial shift toward efficient and scalable solutions, particularly guided, internet-based interventions, as a direct response to the high cost, stigma, and limited professional resources in Indonesia.

The success of these diverse interventions suggests that educational institutions must implement multi-modal and personalized mental health support strategies. Determinants of successful interventions include matching individual preferences, adequate social support, and environmental suitability. To strengthen future scientific evidence, research should prioritize Randomized Controlled Trials (RCTs) to assess the long-term effectiveness and cost-effectiveness of digital and brief interventions. Most importantly, comparative studies should focus on the cultural adaptation of global interventions in the highly diverse Indonesian context, to ensure that programs like Self-Help Plus (SH+) are not only

clinically effective but also relevant and sustainable within the local social and cultural ecosystem.

Declaration of Interest

The authors declare no conflict of interest

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References

- Adriansyah, M. A., Rahayu, D., & Prastika, N. D. (2017). The effect of positive thinking therapy, Cognitive Behavior Therapy (CBT), Managing Life and Planning the Future (MHMMMD) on reducing career anxiety in Mulawarman University Students. *Psikoislamika: Jurnal Psikologi Dan Psikologi Islam*, 14(1), 5. <https://doi.org/10.18860/psi.v14i1.6497>
- American College Health Association. (2022). American College Health Association-National College Health Assessment III: Undergraduate student reference group executive summary spring 2022. American College Health Association.
- Amira, I., Sriati, A., Hendrawati, H., & Chaerani, A. (2021). Literature review: Interventions to reduce anxiety in college students. *Jurnal Kesehatan Bakti Tunas Husada: Jurnal Ilmu-Ilmu Keperawatan, Analis Kesehatan Dan Farmasi*, 21(2), 286. <https://doi.org/10.36465/jkbth.v21i2.760>
- Andriani, D., Purba, F. D., Witteveen, A. B., Zakiah, N., & Sijbrandij, M. (2025). Effectiveness of adapted self-help plus (SH+) to reduce psychological distress among university students in Indonesia (APRESIASI): Protocol of a randomized controlled trial. *BMC Psychology*, 13(1). <https://doi.org/10.1186/s40359-025-03026-y>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Toward a methodological framework. *International Journal of Social Research Methodology*, 8. <https://doi.org/10.1080/1364557032000119616>
- Bahiyyah, A., Marceleni, A., & Wijaya, J. (2024). The influence of positive thinking therapy for anxiety on students. *Indonesian Journal of Multidisciplinary Sciences (IJoMS)*, 3(1), 54–63.
- da Silva, G. C. L., Rossato, L., Correia-Zanini, M., & Scorsolini-Comin, F. (2022). Online group interventions for mental health promotion of college students: Integrative review. *Counselling and Psychotherapy Research*.

- <https://doi.org/10.1002/capr.12561>
- Deliviana, E., Maria Helena Erni, Putri Melina Hilery, & Novi Melly Naomi. (2021). Managing student mental health to optimize online learning during the Covid-19 pandemic. *Jurnal Selaras : Kajian Bimbingan Dan Konseling Serta Psikologi Pendidikan*, 3(2 SE-Articles), 129–138. <https://doi.org/10.33541/Jsvol2iss1pp1>
- Efstathiou, M., Kakaidi, V., Tsitsas, G., Mantzoukas, S., Gouva, M., & Dragioti, E. (2025). The prevalence of mental health issues among nursing students: An umbrella review synthesis of meta-analytic evidence. *International Journal of Nursing Studies*, 163, 104993. <https://doi.org/10.1016/j.ijnurstu.2025.104993>
- El-Monshed, A. H., El-Adl, A. A., Ali, A. S., & Loutfy, A. (2022). University students under lockdown, the psychosocial effects and coping strategies during COVID-19 pandemic: A cross sectional study in Egypt. *Journal of American College Health*, 70(3), 679–690. <https://doi.org/10.1080/07448481.2021.1891086>
- Faradina, S., Az Badal, S. S., Natasya, M., Kamilah, K., Oviyani, E., Belangi, M., Dewi, H. M., & Sumarno, S. (2019). The effect of mandala coloring on reducing anxiety in students in Banda Aceh. *Seurune : Jurnal Psikologi Unsyiah*, 2(2), 108–121. <https://doi.org/10.24815/s-jpu.v2i2.14210>
- Grahatama, E. P., Sartika, D., & Nugraha, S. (2022). The effectiveness of group cognitive behavioral therapy (cbt) for reducing anxiety. *Schema: Journal of Psychological Research*, 67–73. <https://doi.org/10.29313/schema.v0i0.5737>
- Grande, R. A. N., Berdida, D. J. E., Paulino, R. R. J. C., Anies, E. A., Ebol, R. R. T., & Molina, R. R. (2022). The multidimensionality of anxiety among nursing students during COVID-19 pandemic: A cross-sectional study. *Nursing Forum*, 57(2), 267–276. <https://doi.org/10.1111/nuf.12675>
- Gunawan, A., & Oriza, I. I. D. (2023). The feasibility of acceptance and commitment therapy (ACT) in a group setting to increase self-efficacy in students with social anxiety. *Jurnal EMPATI*, 12(2), 94–102. <https://doi.org/10.14710/empati.2023.28512>
- Hamaideh, S. H., Al-Modallal, H., Tanash, M., & Hamdan-Mansour, A. (2022). Depression, anxiety and stress among undergraduate students during COVID-19 outbreak and "home-quarantine." *Nursing Open*, 9(2), 1423–1431. <https://doi.org/10.1002/nop2.918>
- Hidayat, E. (2018). The effect of progressive relaxation therapy on reducing anxiety levels in facing competency tests for level iii students of Muhammadiyah Nursing Academy Cirebon. *Jurnal Keperawatan Soedirman*, 12(2), 93. <https://doi.org/10.20884/1.jks.2017.12.2.740>
- Hikmat, R., Yosep, I., & Mardhiyah, A. (2025). A scoping review of nursing interventions of improving resilience among university students during online learning. *BMC Nursing*, 24(1), 913. <https://doi.org/10.1186/s12912-025-03581-0>
- Hikmat, R., Yosep, I., Mardhiyah, A., Kurniawan, K., & Syabana, M. N. (2025). A scoping review of school-based psychological interventions for adolescent mental health in secondary education: addressing anxiety, depression, and well-being. *Discover Mental Health*. <https://doi.org/10.1007/s44192-025-00336-w>
- Irawan, A., Putri, A. P., Nisha, M., & Widiastuti, A. (2024). The effect of mindfulness meditation on nursing students' stress and anxiety levels. *Indonesian Journal of Global Health Research*, 7(1 SE-Articles). <https://doi.org/10.37287/ijghr.v7i1.3932>
- Joheshi, S. I. Y. A., Wahab, E. A. El, & Mohamed, S. (2025). Mindfulness-based intervention programme on anxiety and resilience among Palestinian nursing students. *The Malaysian Journal of Nursing (MJN)*, 17(2 SE-), 178–187. <https://doi.org/10.31674/mjn.2025.v17i02.017>
- Kaur Khaira, M., Raja Gopal, R. L., Mohamed Saini, S., & Md Isa, Z. (2023). Interventional strategies to reduce test anxiety among nursing students: A systematic review. *International journal of environmental research and public health*, 20(2), 1233. <https://doi.org/10.3390/ijerph20021233>
- Kemenkes RI. (2023). Indonesian Health Survey (SKI) 2023: Mental health facts. In Factsheet. Badan Kebijakan Pembangunan Kesehatan, Kementerian Kesehatan Republik Indonesia.
- Laker, C., Knight-Davidson, P., Hawkes, D., Driver, P., Nightingale, M., Winter, A., & McVicar, A. (2022). The use of 360-degree video in developing emotional coping skills (reduced anxiety and increased confidence) in mental health nursing students: A protocol paper. *Nursing Reports*, 12, 536–544. <https://doi.org/10.3390/nursrep12030052>
- Lee, E., & Park, J.-H. (2023). Effect of acupressure on pre-exam anxiety in nursing students. *Alternative Therapies in Health and Medicine*, 29(5), 158–163.
- Lin, Y., Hu, Z., Alias, H., & Wong, L. P. (2020). Knowledge, attitudes, impact, and anxiety regarding COVID-19 infection among the public in China. *Front Public Health*, 8. <https://doi.org/10.3389/fpubh.2020.00236>
- Listiyandini, R. A., Andriani, A., Afsari, N., Krisnamurthi, P. B. U., Moulds, M. L., Mahoney, A. E. J., & Newby, J. M. (2024). Evaluating the feasibility of a guided culturally adapted internet-delivered mindfulness intervention for Indonesian University students experiencing psychological distress. *Mindfulness*, 15(5), 1095–1108. <https://doi.org/10.1007/s12671-024-02346-1>
- Liu, Y. L., Lee, C. H., & Wu, L. M. (2024). OPEN A mindfulness - based intervention improves perceived stress and mindfulness in university

- nursing students : A quasi - experimental study. *Scientific Reports*, 1–10. <https://doi.org/10.1038/s41598-024-64183-5>
- Luzanil, S. T., & Menaldi, A. (2021). The effectiveness of cognitive behavioral group therapy for treating academic anxiety in out-of-town students. *Jurnal Psikologi Ulayat*, June 2021. <https://doi.org/10.24854/jpu221>
- Machmudati, A., & Diana, R. R. (2017). The effectiveness of positive thinking training in reducing anxiety in writing a thesis in students. *Jurnal Intervensi Psikologi (JIP)*, 9(1), 107–127. <https://doi.org/10.20885/intervensipsikologi.vol9.iss1.art8>
- Mohamed, M. G., Islam, M. R., Ahmed, S. K., Khalaf, S. A., Abdelall, H. A., & Mahmood, K. A. (2024). Assessment of knowledge, attitude, anxiety level and perceived mental healthcare needs toward Mpox infection among nursing students: A multi-center cross-sectional study. *Glob Transit*, 6. <https://doi.org/10.1016/j.glt.2024.10.001>
- Onieva-Zafra, M. D., Fernández-Muñoz, J. J., Fernández-Martínez, E., García-Sánchez, F. J., Abreu-Sánchez, A., & Parra-Fernández, M. L. (2020). Anxiety, perceived stress and coping strategies in nursing students: A cross-sectional, correlational, descriptive study. *BMC Medical Education*, 20(1), 370. <https://doi.org/10.1186/s12909-020-02294-z>
- Primasari, I., Hoeboer, C. M., Sijbrandij, M., & Olff, M. (2025). A web-based psychoeducational programme for trauma-related symptoms in Indonesian undergraduate students: A pilot randomized controlled trial. *European Journal of Psychotraumatology*, 16(1), 1–17. <https://doi.org/10.1080/20008066.2025.2535082>
- Pujiati, L., Hartati, B., & Mulya, R. (2022). The effect of laughter therapy on the anxiety levels of final year students in writing their theses at STIKes Flora. *Jurnal Kebidanan, Keperawatan Dan Kesehatan (Bikes)*, 2(1), 30–35. <https://doi.org/10.51849/j-bikes.v2i1.23>
- Rahmadiana, M., Karyotaki, E., & Passchier, J. (2019). Guided internet-based transdiagnostic intervention for Indonesian university students with symptoms of anxiety and depression: A pilot study protocol. *Internet Interv*, 15. <https://doi.org/10.1016/j.invent.2018.11.002>
- Rahmawati, S. (2021). The psychological impact of distance learning on students' mental health. *Angew Chemie Int Ed* 6, 5, 952–956.
- Rinera, I., & Retnowati, S. (2020). The effect of mbsr training on anxiety in new students. *Gadjah Mada Journal of Professional Psychology (GamaJPP)*, 6(2), 205. <https://doi.org/10.22146/gamajpp.56658>
- Robertson, S. M. C., Short, S. D., Sawyer, L., & Sweazy, S. (2021). Randomized controlled trial assessing the efficacy of expressive writing in reducing anxiety in first-year college students: the role of linguistic features. *Psychology and Health*, 36(9), 1041–1065. <https://doi.org/10.1080/08870446.2020.1827146>
- Ross, J. G., Caputo, T., & Scheve, A. (2025). Effect of NGN-Style case studies on nursing students' anxiety and self-confidence with clinical decision-making. *Nurse Educator*, 50(2), 61–66. <https://doi.org/10.1097/NNE.0000000000001759>
- Sari, D. P., Nugroho, H., & Iskandar, A. (2021). Anxiety level of students of the faculty of medicine, Mulawarman University before facing the OSCE. *Jurnal Sains Dan Kesehatan*, 3(4), 482–488. <https://doi.org/10.25026/jsk.v3i4.348>
- Savitsky, B., Shulman, I., & Kagan, I. (2023). Comprehensive training of community diagnosis and the community-oriented primary health care model in nursing education: An evidence-based project. *Nurse Educator*, 48(6), E178–E182. <https://doi.org/10.1097/NNE.0000000000001437>
- Simpson, M.-C. G., & Sawatzky, J.-A. V. (2020). Clinical placement anxiety in undergraduate nursing students: A concept analysis. *Nurse Education Today*, 87, 104329. <https://doi.org/10.1016/j.nedt.2019.104329>
- Simsek-Cetinkaya, S., & Cakir, S. K. (2023). Evaluation of the effectiveness of artificial intelligence assisted interactive screen-based simulation in breast self-examination: An innovative approach in nursing students. *Nurse Education Today*, 127, 105857. <https://doi.org/10.1016/j.nedt.2023.105857>
- Suyamto, S., Prabandari, Y. S., & Marchira, C. R. (2019). The effect of muscle relaxation in reducing students' t-tmas anxiety scores approaching the final program exam at the Notokusumo Nursing Academy, Yogyakarta. *Berita Kedokteran Masyarakat*, 25(3), 142–149.
- Vo, T. N., Chiu, H.-Y., Chuang, Y.-H., & Huang, H.-C. (2023). Prevalence of stress and anxiety among nursing students: A systematic review and meta-analysis. *Nurse Educator*, 48(3), E90–E95. <https://doi.org/10.1097/NNE.0000000000001343>
- Wang, L., Guo, Y., & Liu, Y. (2022). The effects of a mobile phone-based psychological intervention program on stress, anxiety and self-efficacy among undergraduate nursing students during clinical practice: A randomized controlled trial. *J Prof Nurs*, 42. <https://doi.org/10.1016/j.profnurs.2022.07.016>
- Yan, K., Ikani, N., Yusainy, C., Witterman, C., & Spijker, J. (2025). A brief online mindfulness intervention: study protocol for Indonesian undergraduate students, A randomized controlled trial. *Trials*, 26(1). <https://doi.org/10.1186/s13063-025-08858-y>
- Yazici, H. G., & Ökten, Ç. (2022). Nursing students' clinical practices during the COVID-19 pandemic: Fear of COVID-19 and anxiety

Abdillah, H., et al. (2026)

- levels. *Nursing Forum*, 57(2), 298–304. <https://doi.org/10.1111/nuf.12680>
- Yosep, I., Fitria, N., Mardhiyah, A., Pahria, T., Yamin, A., & Hikmat, R. (2024). Experiences of bullying among nursing students during clinical practice: A scoping review of qualitative studies. *BMC Nursing*, 23(1), 832. <https://doi.org/10.1186/s12912-024-02439-1>
- Yosep, I., Suryani, S., Mediani, H. S., Mardhiyah, A., & Maulana, I. (2023). Digital therapy: Alleviating anxiety and depression in adolescent students during COVID-19 online learning - A scoping review. *Journal of Multidisciplinary Healthcare*, 16, 1705–1719. <https://doi.org/10.2147/JMDH.S416424>
- Zhang, Y., Han, T., Yao, H., Sun, L., Zhao, M., Zhu, L., Zhang, J., & Liao, Y. (2024). Analysis of sub-clinical eating disorders and associated factors in college students. *Chinese Journal of School Health*, 45(8), 1157–1161. <https://doi.org/10.16835/j.cnki.1000-9817.2024247>
- Zukhra, R. M., Nauli, F. A., & Konadi, A. (2021). Anxiety among nursing students during the Covid-19 pandemic: A web-based cross-sectional survey. *Enferm Clin*, 31. <https://doi.org/10.1016/j.enfcli.2021.04.016>

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