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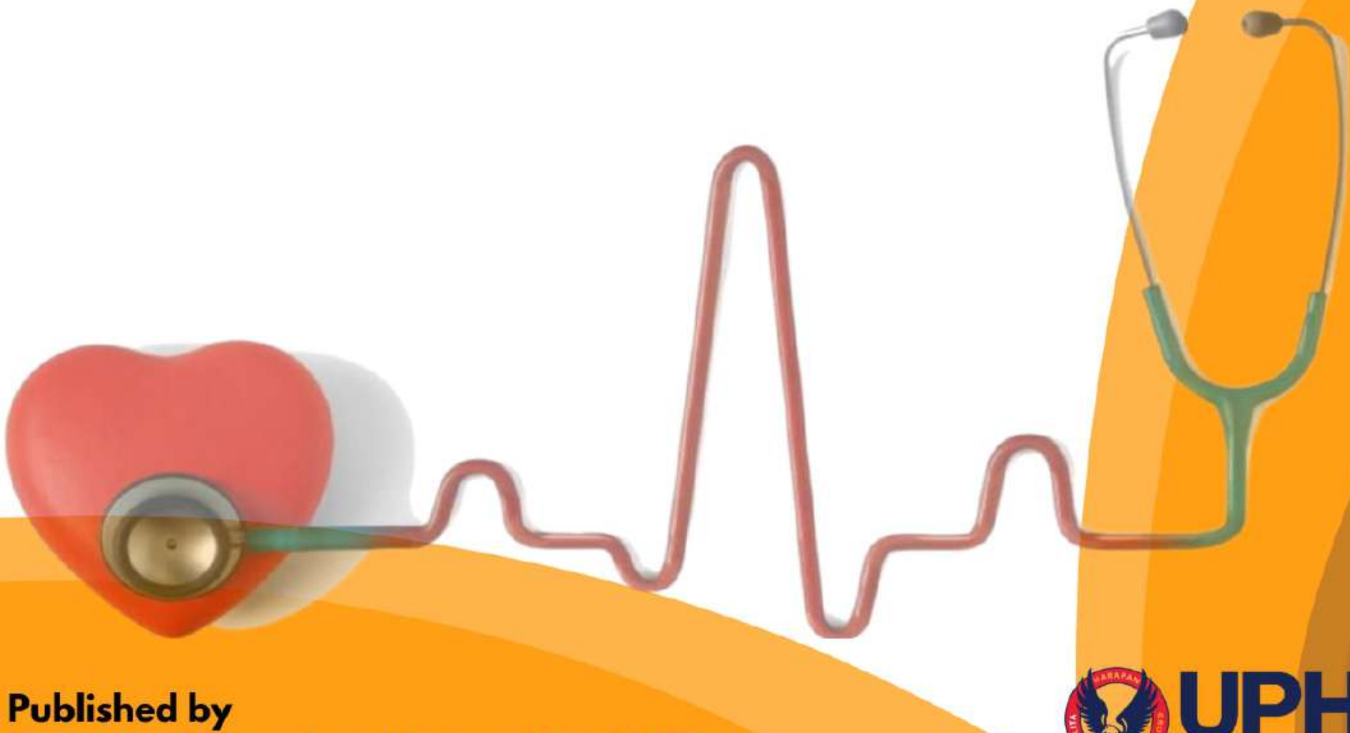

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REMARKS

We offer our praise and gratitude to the Lord Jesus Christ for His blessings and guidance, which have enabled the publication of Nursing Current, Faculty of Nursing, Universitas Pelita Harapan, Vol. 14 No. 1, June 2026.

This edition stands as a reflection of our faithfulness in stewardship of the talents entrusted to us by God, particularly in advancing nursing science—a pursuit that harmonizes academic excellence with a calling to serve others with love, integrity, and wisdom.

The diverse scientific works presented herein demonstrate our ongoing commitment to addressing contemporary challenges in healthcare and nursing education through innovative and evidence-based approaches.

Through Nursing Current, the Faculty of Nursing at UPH invites educators, researchers, practitioners, and nursing students to remain active in writing and sharing knowledge as an expression of our shared faith.

It is our prayer and hope that this journal serves as a vessel to glorify God, inspire nursing practice, and nurture a generation of professional nurses who are competent, compassionate, and faithful in services.

May God bless every scholarly contribution and ministry dedicated through this journal.

Dr. Grace Solely Houghty, M.B.A., M.Kep
Dean, Faculty of Nursing Universitas Pelita Harapan

FOREWORD

With gratitude to God, we are pleased to present *Nursing Current: Jurnal Keperawatan*, Volume 14, No. 1 (2026). This issue highlights current efforts to improve the quality of evidence-based healthcare and nursing practice. The articles featured address a range of important topics, including maternal and geriatric health, nursing workforce well-being, pediatric nursing care, chronic disease management, and evidence-based therapeutic interventions.

As part of our commitment to continuous improvement, we are expanding our editorial and reviewer network to strengthen the quality and international reach of the journal. We are also preparing for international indexing in the coming year to increase the visibility and impact of published research. Authors are encouraged to respond promptly to reviewer feedback to facilitate an efficient publication process.

We extend our sincere appreciation to all authors, reviewers, and readers for their valuable contributions and ongoing support. We hope this volume serves as a useful resource for advancing nursing knowledge, research, and practice.

Warm regards,
Dr. Ni Gusti Ayu Eka
Editor-in-Chief

LIST OF CONTENTS

Editorial Board **i**
Remarks **iii**
Foreward **iv**
List of Contents **v**

A Comparative Analysis of Kidney Donation Regulations and Ethics in Spain, the USA, and Iran: Lessons for the Indonesian Transplantation Framework 1-14
Netral Gulo, Yulia, Anggri Noorana Zahra, Agung Waluyo

Workload and Sleep Quality among Medical-Surgical Ward Nurses in a Private Hospital in Eastern Indonesia 15-22
Neni Ekaristi Br Sianturi, Nora Berliana Permatasari Gulo, Petronela Apriliani D. Kelen, Janwar Olang, Mega Sampepadang

Self-Management Behaviors among Adults with Hypertension in Coastal Communities: A Descriptive Observational Study 23-31
Ayuk Cucuk Iskandar, Farhah Kamilah

Effect of Saluang Music on Systolic Blood Pressure and Fatigue in Patients with Chronic Kidney Disease Undergoing Hemodialysis 32-37
Lenni Sastra, Zulham Efendi, Cintya Angeline Prawesthi

Cognitive Status and Quality of Life Among Older Adults: Implications for the Development of an Interdisciplinary Home Visit Model 38-45
Mei Rianita Elfrida Sinaga, Vivi Retno Intening, Reni Puspitasari3, Nathan Agwin Khenda

Burnout and Adherence to Pressure Injury Prevention Guidelines Among ICU Nurses in a Teaching Referral Hospital 46-52
Chiyar Edison Sunarya

Effectiveness of Nursing Interventions in Managing Arteriovenous Fistula Insertion Pain in End-Stage Renal Failure Patients Undergoing Hemodialysis: Systematic Review 53-63
Ronald Limaheluw, Shanty Wulan Insafni Ndraha, Yehezkiel Melco Pellaupessy, Magda Fiske Rumambi, Heman Pailak

The Role of Cognitive Behavioral Therapy in Improving Quality of Life Among Patients with Psoriasis: A Literature Review 64-73
Raphita Diorarta, Dwiyantoro

Nursing Diagnoses in Pediatric Surgical Inpatients: A Cross-Sectional Study 74-84
Gita Adelia, Eka Malfasari, Deswinda, Candra Saputra, Bayu Azhar, M. Zul Irfan, Rizka Febtrina, Noni Ramadianty

Determinants of Anemia among Pregnant Women at UPTD Puskesmas Seba, Sabu Raijua Regency 85-94
Nindy Putri Elisabet Amtaran, Sunardi, Sri Haryuni, Yudied Agung Mirasa

The Relationship between Knowledge of Phlebitis and Motivation for Phlebitis Prevention among Nursing Students in Tangerang 95-103
Charles L. Tiolemba, Jumita Tulak, Krishariyono Gulo, Martha Octaria, Shinta Marina Josephina Putri Sihaloho

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Original Research

A Comparative Analysis of Kidney Donation Regulations and Ethics in Spain, the USA, and Iran: Lessons for the Indonesian Transplantation Framework

Netral Gulo[a*], Yulia[b], Anggri Noorana Zahra[c], Agung Waluyo[d]

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ABSTRACT

Background: Inequitable access to kidney donors remains a global challenge, including in Indonesia, where kidney transplantation is received by only approximately 1% of patients with end-stage renal disease (ESRD). Comparative analyses of different kidney donation regulatory models and their ethical implications for Indonesia remain limited. Objective: To compare kidney donation regulations and ethical frameworks in Spain (opt-out, where individuals are considered donors unless they explicitly refuse), the United States (opt-in, where individuals voluntarily register as donors), and Iran (regulated compensation), and to assess their relevance to the Indonesian context. Methods: A narrative literature review employing comparative thematic analysis was conducted using 12 articles published between 2015 and 2025. Results: The effectiveness of kidney donation systems depends not only on legal frameworks but also on their implementation, public trust, donor protection, and transparency. Spain achieved high participation rates through a coordinated opt-out system supported by strong public education initiatives. The United States emphasizes individual autonomy through voluntary donor registration but continues to face challenges related to equitable organ distribution. Iran has increased donor availability through a regulated compensation system, although ethical concerns regarding equity and potential exploitation persist. Conclusion: No single kidney donation model is universally applicable. Indonesia requires a context-specific transplantation framework that integrates ethical principles, sociocultural values, and institutional capacity while emphasizing public education, transparency, and donor protection.

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INTRODUCTION

Kidney transplantation is considered the definitive treatment for patients with end-stage renal disease (ESRD) because it has been shown to be more effective in reducing mortality and improving quality of life compared with long-term dialysis (Chadban et al., 2020). Globally, the number of kidney transplants exceeds 150,000 procedures annually; however, this increase has not kept pace with the growing number of patients requiring transplantation (Global Observatory on Donation and Transplantation [GODT], 2024). In the United States, 23,401 kidney transplants were performed in 2019 (GODT, 2024). In contrast, kidney transplantation remains relatively uncommon in Indonesia, accounting for only approximately 1% of patients with ESRD nationwide (Indonesian Renal Registry, 2018). Clinical data indicate that only 491 kidney transplants were performed in Jakarta over a seven-year period (Marbun et al., 2017). Meanwhile, a report from Siloam Hospitals Asri noted that more than 500 kidney transplants have been performed, all involving living donors (Alam, 2026). This imbalance between demand and donor availability reflects an ongoing organ donor shortage that remains a global challenge and contributes to high mortality rates among patients on transplant waiting lists (World Health Organization [WHO], 2023).

The limited availability of donors is closely related to the organ donation system implemented in transplantation practice. In general, kidney donors are divided into two main categories: living donors and deceased donors (Van Arendonk et al., 2015). Deceased donors require a clear registration system, family consent procedures, and a transparent and equitable organ allocation mechanism. In contrast, living donors require robust donor protection and strict oversight to prevent organ trafficking and ensure donor safety (Van Arendonk et al., 2015). From a bioethical perspective, organ transplantation must be guided by four fundamental principles: autonomy, justice, beneficence, and nonmaleficence (Martinelli et al., 2024). Therefore, the development of a strong and ethical organ donation system is essential for maintaining the sustainability of transplantation programs and protecting the rights of both donors and recipients (Delmonico et al., 2011).

Various countries have adopted different policy approaches to organ donation, shaped by their legal frameworks, cultural values, and healthcare systems. Spain is recognized as having one of the highest organ donation rates in the world, with approximately 46 donors per million population. This achievement is largely attributed to its opt-out system, in which individuals are presumed to be donors unless they formally register their refusal before death (Organización Nacional de Trasplantes, 2023). In contrast, the United States employs an opt-in system that requires individuals to voluntarily register as organ donors. To encourage living donation, the U.S. government also provides support in the form of travel assistance and reimbursement for lost wages during the recovery period (United Network for Organ Sharing, 2023).

Meanwhile, Iran has adopted a different approach by allowing regulated financial compensation for living kidney donors. This policy makes Iran the only country that legally permits direct monetary incentives for kidney donation and has reportedly eliminated the kidney transplant waiting list (Ghods & Savaj, 2006). However, this model remains controversial because of concerns regarding the potential exploitation of socially and economically vulnerable populations (Ghods & Savaj, 2006).

In Indonesia, the development of a kidney transplantation system continues to face various structural and social challenges. Kidney transplantation is estimated to meet less than 5% of the needs of patients with ESRD who require this therapy (Supit et al., 2019). The low transplantation rate is influenced by several factors, including limited public awareness of organ donation, a suboptimal national donor registration system, and the absence of comprehensive policies supporting living donors. In addition, the potential for illegal organ trafficking remains a concern, highlighting the need for stronger regulation and ethical oversight within the transplantation system (Kusumawati, 2024). Although Indonesia has established a legal framework through Health Law No. 17 of 2023 and Government Regulation No. 53 of 2021 concerning Organ and Tissue Transplantation, the current system remains largely based on explicit donor consent and prohibits any form of commercial organ transaction (Government Regulation of the Republic of Indonesia Number 53 of 2021 Concerning Organ and Tissue Transplantation, 2021; Law of the Republic of Indonesia Number 17 of 2023 Concerning Health, 2023). Consequently, the implementation of alternative models such as presumed consent (opt-out) or compensated donation faces substantial legal, ethical, and sociocultural challenges. These constraints highlight the importance of examining international experiences to identify policy approaches that may be adapted to the Indonesian context. Based on these considerations, this literature review aims to analyze and compare the regulatory systems and ethical approaches to kidney donation in three countries with distinct policy models: Spain, the United States, and Iran. This analysis is expected to provide a more comprehensive understanding of international approaches to kidney donor management and identify best practices that may inform the development of Indonesia's kidney transplantation system. In addition, this study is expected to contribute to the development of more ethical, effective, and sustainable transplantation policies while taking into account social and cultural values as well as the safety of both donors and recipients.

METHOD

This study employed a narrative literature review with comparative thematic analysis to evaluate regulatory and ethical approaches to kidney donation in Spain, the United States, and Iran. These countries were purposively selected because they represent three contrasting policy models frequently discussed in the transplantation literature: a solidarity-based opt-out system (Spain), a voluntary opt-in system (the United States), and a regulated compensation system (Iran) (Ghods & Savaj, 2006; Matesanz et al., 2017; Shimazono, 2007). Beyond their policy differences, these countries were considered relevant to Indonesia because they address key challenges also faced by the Indonesian transplantation system, including donor shortages, ethical concerns regarding living donation, public acceptance of organ donation, and the need for effective regulatory oversight. Furthermore, these three models offer distinct perspectives on balancing autonomy, justice, donor protection, and societal responsibility, which are central considerations in developing a sustainable and ethically acceptable kidney donation framework in Indonesia. A narrative review approach was chosen because it enables an in-depth exploration of policy contexts, sociocultural influences, and ethical dimensions that shape transplantation practices across different healthcare systems (Greenhalgh et al., 2005).

The literature search was conducted in major electronic databases, including PubMed, Scopus, ScienceDirect, and Google Scholar. The search was supplemented with official policy documents from international organizations and relevant institutions, such as the WHO, GODT, ONT, UNOS, and the Iranian Society of Organ Transplantation (Global Observatory on Donation and Transplantation (GODT), 2024; Organización Nacional de Trasplantes, 2023; United Network for Organ Sharing, 2023; World Health Organization, 2023). The search strategy used the keywords “kidney donation,” “organ transplant policy,” “ethics of organ donation,” “Spain opt-out system,” “Iran kidney market,” “UNOS kidney allocation,” and “transplant regulation in Indonesia,” combined with Boolean operators (AND, OR, NOT) to optimize search results (Booth et al., 2016).

The inclusion criteria comprised scientific articles and policy documents discussing regulatory and/or ethical aspects of kidney transplantation, available in full text, published in English or Indonesian, and published within the last ten years. Eligible publication types included review articles, qualitative studies, quantitative studies, and reports from international organizations. Seminal publications published before the predefined eligibility period were retained when considered essential for explaining the historical development, regulatory evolution, and ethical foundations of national kidney donation policies. Exclusion criteria included gray literature (e.g., theses and dissertations), articles focusing solely on clinical or technical aspects without addressing ethical or policy dimensions, and duplicate publications.

The selection process involved title and abstract screening followed by full-text eligibility assessment. The identification, screening, eligibility, and inclusion stages were documented using a PRISMA-style flow diagram to enhance transparency in the literature selection process (Moher et al., 2009; Page MJ et al., 2020). As this study employed a narrative literature review approach, a formal quality appraisal tool was not applied. Nevertheless, efforts were made to ensure the credibility of the evidence by including peer-reviewed publications, official policy documents, and internationally recognized reports that met the predefined inclusion criteria.

Eligible articles were analyzed using content analysis. Extracted data included donor system models, donor protection mechanisms, equity in organ allocation, and the ethical principles underpinning kidney donation policies in each country (Tong et al., 2012). Quantitative indicators, such as donation rates per million population and annual transplant numbers, were used to support the descriptive comparative analysis (Global Observatory on Donation and Transplantation (GODT), 2024; Organización Nacional de Trasplantes, 2023; United Network for Organ Sharing, 2023).

To enhance validity, source triangulation was conducted by comparing findings from peer-reviewed scientific articles with official policy documents and reports issued by national and international transplantation authorities (Patton, 1999). Information regarding donor regulations, ethical principles, organ allocation systems, and donor protection mechanisms was cross-checked across multiple sources to verify consistency and identify potential discrepancies. In addition, findings were compared across the three countries to ensure that policy interpretations were supported by both empirical evidence and official regulatory frameworks.

RESULT

A total of 12 articles met the inclusion criteria and were included in the final analysis. The study selection process consisted of identification, screening, eligibility assessment, and inclusion stages, as summarized in Figure 1. From an initial 1,248 records identified through database searches and supplementary policy sources, 312 duplicate records were removed, leaving 936 records for title and abstract screening. Following screening, 124 articles underwent full-text eligibility assessment, and 12 studies were ultimately included in the review. These studies represented three countries with distinct approaches to kidney donation regulation and ethics: Spain (n = 4), the United States (n = 4), and Iran (n = 4).

Thematic analysis of the included studies identified four overarching themes: (1) regulatory models of kidney donation, (2) ethical principles underpinning donation policies, (3) donor protection and safeguarding mechanisms, and (4) equity and access in organ allocation. These themes served as the analytical framework for comparing kidney donation systems across the three countries and for identifying policy implications relevant to Indonesia. The characteristics and key findings of the included studies are summarized in Table 1.

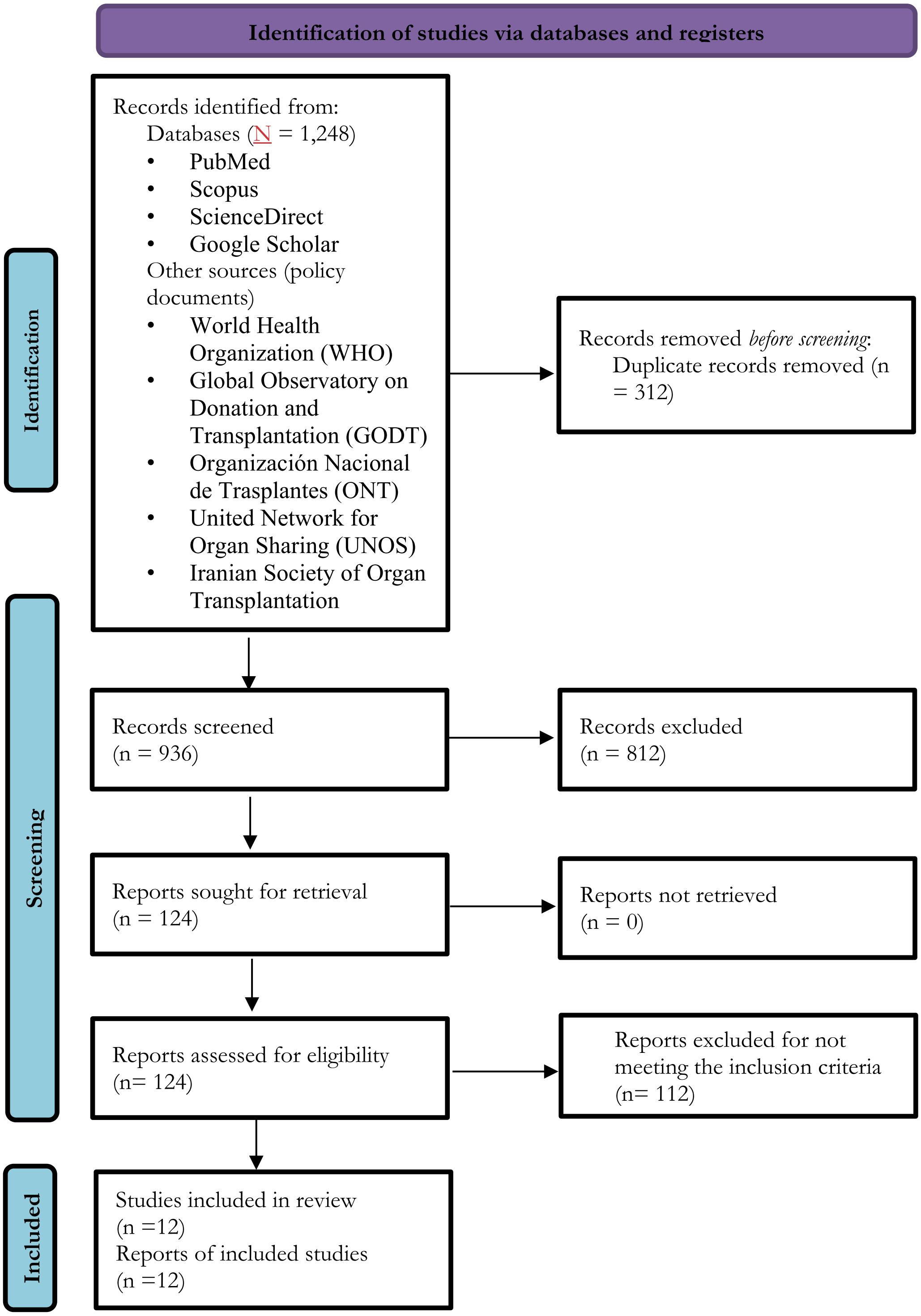

Figure 1. PRISMA Flow Diagram

Table 1. Summary of Articles Comparing Kidney Donation Regulations and Ethics by Country

Author (year)	Country	Article Title	Main Focus	Policy System	Results
Streit et al., (2023)	Spain	Ten Lessons from the Spanish Model of Organ Donation and Transplantation	Opt-out	Solidarity, Justice	National coordination systems and broad public education have been proven to enhance organ donation rates.
Sharif (2017)	Spain	Viva España-Lessons from the Spanish Organ Donation System	Opt-out	Beneficence, Solidarity	Family consent is maintained even when a national presumed consent system is implemented
Díaz-Cobacho et al., (2022)	Spain	Public Perception of Organ Donation and Transplantation Policies in Southern Spain	Opt-out	Autonomy Collective, Transparency	Research shows widespread public approval for donation; however, a significant gap in understanding persists concerning opt-out policies.
Rudge (2018)	Spain	Organ Donation: Opting In or Out?	Opt-out	Justice, System effectiveness	The opt-out system is considered more effective and ethical in the context of populations with high health literacy.
Klarman & Formica (2020)	USA	Ethical and Legal Imperative	*Opt-in*	Justice, Utility	The new national allocation policy is considered more equitable in reaching geographically vulnerable patients.
Organ Procurement and Transplantation Network (2015)	USA	Ethical Principles in the Allocation of Human Organs	*Opt-in*	Respect for person, Justice, Utility	The document establishes national principles to ensure a fair and ethical allocation across the system
Henderson & Gross (2017)	USA	Living Organ Donation and Informed Consent in the United States: Strategies to Improve the Process.	*Opt-in*	Autonomy, Non-maleficence	The need for institutional support was emphasized to ensure that donors make decisions free from pressure.

Author (year)	**Country**	**Article Title**	**Main Focus**	**Policy System**	**Results**
Hays (2015)	USA	Informed consent of living kidney donors: Pitfalls and best practice.	*Opt-in*	Autonomy, Beneficence, Justice	The informed consent process remains inconsistent across transplant centers; national standardization is needed.
Roth et al., (2022)	Iran	Criminal, Legal, and Ethical Kidney Donation	Compensation (Regulated)	Justice, Non-maleficence	The government compensation scheme has been shown to increase the availability of kidneys without increasing the rate of exploitation.
Siraj (2022)	Iran	How a compensated kidney donation program facilitates the sale of human organs in a regulated market: the implications of Islam on organ donation and sale	Compensation (Regulated)	Autonomy, Justice	An emphasis on the need for regulations grounded in religious values to curb illegal practices.
Kiani et al., (2018)	Iran	Ethical Challenges in Iran	Compensation	Autonomy, Beneficence	Disparities in access and weak legal protections for donors in rural areas have been identified.
Moghaddasi Kelishomi & Sgroi (2024)	Iran	A field study of donor behaviour in the Iranian kidney market	Compensation	Autonomy, Justice	Donations are driven more by economic factors than by altruism; the risk of exploitation remains.

DISCUSSION

The global crisis in kidney donor availability has prompted various countries to develop diverse donation systems, both in terms of regulation and ethical approaches (Streit et al., 2023b). Despite continuous advances in transplantation medicine, the demand for donor kidneys substantially exceeds organ availability worldwide. According to the Global Observatory on Donation and Transplantation (GODT), more than 150,000 organ transplant procedures are performed annually; however, this number satisfies only a fraction of the global need, leaving many patients on waiting lists and contributing to avoidable morbidity and mortality (GODT, 2024). This persistent gap has encouraged countries to implement different regulatory and ethical strategies to increase donor participation while safeguarding donor rights and maintaining public confidence in transplantation systems. Although kidney transplantation has been performed in Indonesia, the existing donor system has not yet been able to meet national needs in a fair and sustainable manner. Therefore, this study compares three contrasting kidney donation models in Spain, the United States, and Iran to identify policy approaches that may inform the development of a more effective, ethical, and contextually appropriate transplantation framework in Indonesia.

The findings indicate that the success of a kidney donation system is influenced not only by legal frameworks but also by public trust, institutional capacity, and effective implementation. Spain serves as a successful example of an opt-out system; however, evidence suggests that its achievements are attributable not only to presumed consent legislation but also to strong national coordination, specialized transplant coordinators, and sustained public education initiatives (Díaz-Cobacho et al., 2022; Streit et al., 2023). From a bioethical perspective, the Spanish model reflects the principle of solidarity, which emphasizes collective responsibility for promoting public welfare through organ donation. This approach aligns closely with communitarian ethics, whereby individual decisions are understood within a broader social context and a shared commitment to the common good. Importantly, despite the implementation of presumed consent, family involvement remains an integral component of the final decision-making process, thereby preserving relational autonomy and maintaining public trust in the transplantation system (Rudge, 2018). From a health policy perspective, Spain's success also reflects strong institutional governance and policy legitimacy, which foster public confidence and encourage participation in organ donation. These findings suggest that the effectiveness of an opt-out system depends not only on legislative mechanisms but also on the development of social trust and institutional credibility.

In contrast, the United States maintains an opt-in system that prioritizes individual autonomy as its central ethical principle. This approach provides strong protection of individual rights through informed consent mechanisms; however, it continues to face challenges related to equitable access and consistency in policy implementation. Recent reforms to the organ allocation system have sought to improve distributive justice by reducing geographic disparities and expanding access to transplantation for underserved populations (Klarman & Formica, 2020b). Nevertheless, important structural inequities remain. Access to transplantation may be influenced by socioeconomic status, insurance coverage, geographic location, and healthcare resources, potentially creating disparities among patient populations. Furthermore, studies have highlighted persistent racial and ethnic inequities in transplant access and outcomes, raising concerns regarding fairness and equal opportunity within the healthcare system. From an ethical perspective, these disparities challenge the realization of justice and equity despite the system's strong emphasis on autonomy. Variations in informed consent practices across transplant centers further suggest the need for more integrated national standards to ensure consistent donor protection and equitable access to transplantation services (Henderson & Gross, 2017; Organ Procurement and Transplantation Network, 2015). Thus, while the opt-in system excels in safeguarding individual choice, ongoing efforts are required to address systemic inequities that may limit fair access to transplantation.

Iran presents a distinct model through its legally regulated financial compensation system for living kidney donors. This approach has been effective in increasing organ availability and substantially reducing transplant waiting lists (Ghods & Savaj, 2006). Nevertheless, the model remains the subject of considerable ethical debate. From the perspective of commodification theory, the introduction of financial incentives raises concerns that human organs may be treated as market commodities rather than as elements of human dignity and personhood. Ethical concerns are further reinforced by vulnerability frameworks, which argue that individuals experiencing economic hardship may be disproportionately influenced by financial incentives, potentially compromising the voluntariness of their decisions. Consequently, although participation may appear autonomous, critics contend that socioeconomic pressures can blur the distinction between free and constrained choice. Furthermore, exploitation frameworks highlight the possibility that financially disadvantaged populations may bear a disproportionate share of donation-related risks while wealthier recipients derive the primary benefits. Consistent with these concerns, studies from Iran have reported that economic motivations frequently play a dominant role in donor decision-making and that disparities in legal protection remain evident, particularly in resource-limited settings (Kiani et al., 2018; Roth et al., 2022). These findings indicate that evaluations of transplantation systems should consider not only donor availability but also broader ethical dimensions, including donor autonomy, social justice, and protection against exploitation. Comparatively, these findings suggest that no single donor system model is entirely ideal. A system's success is more determined by the alignment of policies with the social and cultural context, as well as the level of public trust in healthcare institutions. Spain emphasizes solidarity and public trust, the United States highlights the protection of individual autonomy, while Iran emphasizes efficiency through incentive mechanisms. These three models represent a spectrum of approaches ranging from collective ethics, individual ethics, to a needs-based utilitarian approach.

In the Indonesian context, the development of a kidney donation system requires a holistic and adaptive approach that integrates legal, ethical, institutional, and sociocultural considerations. The establishment of a national donor registry and the expansion of public education initiatives may draw valuable lessons from the Spanish experience in fostering donor participation and public trust. Likewise, principles of transparency, informed consent, and protection of living donors, as emphasized in the United States, should form the foundation of donor governance in Indonesia. However, the implementation of these strategies may face several challenges, including limited transplantation infrastructure, uneven distribution of specialized healthcare services, fragmented data systems, and varying levels of public awareness regarding organ donation.

From a sociocultural perspective, Indonesia shares important characteristics with Spain and Iran, particularly the strong influence of solidarity, communal values, and religious beliefs on health-related decision-making. Similar to Spain, traditions of mutual assistance and collective responsibility may provide a favorable foundation for promoting organ donation as an act of social solidarity. At the same time, as in Iran, religious and moral values play an important role in shaping public perceptions toward organ donation. These factors may facilitate public acceptance when supported by appropriate religious engagement and ethical education. Nevertheless, discussions regarding financial incentives for donors remain ethically sensitive. Although compensation may be viewed as a mechanism to increase organ availability, concerns regarding commodification, unequal bargaining power, and the potential exploitation of economically vulnerable populations warrant careful consideration.

Therefore, any discussion of donor incentives in Indonesia should be accompanied by robust ethical safeguards and regulatory oversight. Ultimately, the development of a sustainable kidney donation system in Indonesia will require not only regulatory reform but also strong institutional capacity, intersectoral coordination, and sustained public engagement to ensure fairness, transparency, and ethical integrity.

Although this study provides a comprehensive comparative analysis, several limitations should be acknowledged. The findings were derived exclusively from secondary data and focused on three countries representing distinct kidney donation models, which may limit their generalizability to other settings. In addition, as a narrative literature review, this study did not include a formal quality appraisal of the included studies. Future research should incorporate empirical data from Indonesian stakeholders to generate more context-specific recommendations for kidney transplantation policy development. As an initial step, qualitative studies exploring public trust, cultural acceptance, and stakeholder perspectives regarding a national donor registry may provide valuable evidence to support the development of an effective and socially acceptable organ donation framework in Indonesia.

CONCLUSION

This review compared the regulatory and ethical approaches to kidney donation in Spain, the United States, and Iran, representing the opt-out, opt-in, and regulated compensation models, respectively. The findings demonstrate that the effectiveness of a kidney donation system is shaped not only by its legal framework but also by broader sociocultural, ethical, and institutional factors. Spain illustrates the importance of solidarity, public trust, and coordinated governance; the United States emphasizes autonomy, informed consent, and donor protection; whereas Iran highlights both the potential benefits and ethical challenges associated with financial incentives.

The findings suggest that no single model can be universally applied across countries. For Indonesia, the development of a sustainable kidney donation system should integrate strong regulatory oversight, public education, donor protection, and culturally sensitive approaches that reflect local social and religious values. Establishing a national donor registry, strengthening public trust, and ensuring safeguards against exploitation may represent important priorities for future policy development. By combining ethical principles with context-specific governance strategies, Indonesia may advance a more equitable, transparent, and sustainable transplantation system.

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Original Research

Workload and Sleep Quality Among Medical-Surgical Ward Nurses in a Private Hospital in Eastern Indonesia

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ABSTRACT

Nurses in medical-surgical wards manage high patient loads, complex clinical conditions, administrative responsibilities, and extended working hours. These demands may increase physical and psychological strain, potentially impairing sleep quality and affecting job performance and patient safety. This study aimed to examine the relationship between workload and sleep quality among nurses in a private hospital in Eastern Indonesia. Methods: A quantitative cross-sectional design was employed. All 96 nurses working in the medical-surgical wards were included using a total sampling technique. Workload was assessed using a standardized workload questionnaire, while sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI). Descriptive statistics were used to summarize respondent characteristics, and the Chi-square test was performed to determine the association between workload and sleep quality. Results: A statistically significant relationship was found between workload and nurses' sleep quality ($p = 0.006$). Among nurses with a heavy workload, 98.2% experienced poor sleep quality, compared with 82.5% of those with a light workload. Overall, 58.3% of nurses reported a heavy workload, while 91.7% experienced poor sleep quality. These findings indicate that nurses with heavier workloads were more likely to experience poor sleep quality than those with lighter workloads. Conclusion: Higher workload was significantly associated with poorer sleep quality among nurses. Hospitals are encouraged to routinely evaluate staffing patterns and workload distribution, implement fatigue-management strategies, and promote occupational health programs to improve nurses' well-being and maintain the quality and safety of patient care.

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INTRODUCTION

Health services are organized efforts aimed at maintaining and improving health, preventing disease, and providing promotive, preventive, curative, and rehabilitative care for individuals and communities. In Indonesia, healthcare delivery is implemented through an integrated and collaborative system involving multiple healthcare professionals to ensure patient safety and quality of care (Ministry of Health of the Republic of Indonesia, 2017). Within this system, nurses play a central role because they provide continuous patient care, maintain direct interaction with patients, and coordinate multidisciplinary healthcare services. In addition to implementing nursing interventions, nurses are responsible for monitoring patients' conditions, facilitating communication among healthcare teams, educating patients and families, and ensuring continuity of care. These responsibilities position nurses as key contributors to healthcare outcomes and patient safety (Stimpfel et al., 2020).

Globally, nurses represent the largest proportion of healthcare workers and serve as frontline providers of hospital-based care. The increasing complexity of healthcare systems, technological advancements, and rising patient acuity have substantially expanded nurses' responsibilities beyond bedside care to include clinical decision-making, comprehensive documentation, and adherence to patient safety standards (Stimpfel et al., 2020). Consequently, nurses frequently experience substantial occupational demands, particularly in medical-surgical wards where patient conditions are often unstable and require continuous monitoring. In these settings, nurses are expected to manage high patient turnover, respond rapidly to emergencies, and maintain accurate clinical documentation while simultaneously ensuring the quality and safety of care.

Nurses account for approximately 75% of hospital healthcare personnel, making them the dominant workforce in clinical settings (Nurjanah & Sakka, 2017). This substantial presence increases exposure to the physical, cognitive, and emotional demands associated with nursing practice. Nursing workload extends beyond working hours and encompasses multiple dimensions, including physical activities, cognitive processing, emotional engagement, and organizational responsibilities. Excessive workload may arise from prolonged shifts, overtime, inadequate staffing, and increasing patient dependency, all of which may reduce opportunities for adequate recovery and rest (Stimpfel et al., 2020). Although Indonesian regulations generally establish working hours of 120–150 hours per month, nurses frequently exceed these limits because of workforce shortages and increasing healthcare demands. Persistent exposure to excessive workload has been associated with fatigue, burnout, decreased job satisfaction, and impaired quality of patient care (Phillips, 2020).

The relationship between workload and sleep quality can be explained through the fatigue–recovery model, which proposes that continuous occupational demands without sufficient recovery periods may lead to cumulative fatigue and physiological exhaustion. In nursing, inadequate recovery due to prolonged working hours and shift rotations may impair sleep quality and hinder physical and psychological restoration. Furthermore, circadian disruption theory suggests that rotating and night-shift schedules interfere with the body's biological clock, resulting in difficulties initiating and maintaining restorative sleep. These theoretical perspectives indicate that excessive workload and irregular scheduling may negatively affect nurses' sleep patterns and overall well-being.

Sleep is a fundamental physiological requirement that is essential for maintaining cognitive performance, emotional regulation, immune function, and physical health. Adequate sleep is particularly important for nurses because their professional responsibilities require sustained concentration, rapid clinical judgment, and continuous vigilance. Sleep quality refers not only to sleep duration but also to sleep continuity, efficiency, and the subjective perception of restfulness. Conversely, poor sleep quality is characterized by fragmented sleep, insufficient sleep duration, difficulty initiating sleep, and non-restorative sleep (Maisa et al., 2021). Inadequate sleep among nurses has been associated with fatigue, impaired concentration, reduced productivity, emotional instability, and an increased risk of occupational incidents and patient safety events.

Shift work further contributes to sleep disturbances among nurses. Rotating schedules and night shifts disrupt circadian rhythms and reduce opportunities for restorative sleep, particularly among nurses working in medical-surgical units where patient care activities continue around the clock. Previous studies have demonstrated that nurses working rotating shifts frequently experience insomnia, daytime sleepiness, chronic fatigue, and reduced sleep efficiency. Persistent sleep disruption may also contribute to long-term health consequences, including cardiovascular disease, metabolic disorders, anxiety, and depression. These findings indicate that sleep quality is not only an individual health concern but also an important determinant of healthcare performance and patient safety.

Empirical evidence consistently demonstrates a significant relationship between workload and sleep disturbances among nurses. Phillips (2020) reported that nurses in medical-surgical units frequently perceived their workload as excessive, contributing to occupational strain and reduced quality of care. Similarly, international studies have shown that high workload and inadequate staffing are associated with fatigue and sleep disturbances, particularly in hospital units characterized by high patient dependency and demanding clinical environments. Excessive workload may therefore compromise both nurses' well-being and the effectiveness of healthcare delivery.

Evidence from Indonesia reflects similar patterns. A study conducted in Manado identified a significant association between workload and sleep disturbances among nurses, with 59.4% of respondents reporting sleep-related problems (Tareluan, 2016). In Kupang City, Mesa et al. (2018) found that 90.48% of shift nurses experienced mild sleep disturbances associated with prolonged working hours and fatigue. Other Indonesian studies have similarly reported that rotating shifts, overtime, and inadequate staffing contribute to fatigue and reduced sleep quality among nurses. These conditions may adversely affect nurses' physical endurance, psychological well-being, and work performance, ultimately influencing patient safety and healthcare quality.

Despite growing evidence regarding workload and sleep quality among nurses, research focusing on private hospitals in Eastern Indonesia remains limited. Most previous studies have been conducted in public hospitals or urban healthcare facilities in western regions of Indonesia, potentially limiting the generalizability of the findings to other healthcare contexts. Differences in staffing systems, hospital resources, workload distribution, and organizational management may influence occupational health outcomes among nurses in Eastern Indonesia. Therefore, further investigation is needed to better understand the relationship between workload and sleep quality within this specific healthcare setting.

Preliminary interviews with nurses in a private hospital in Eastern Indonesia revealed several occupational challenges, including irregular scheduling, limited opportunities for rest during shifts, overtime work, and substantial work pressure. Some nurses reported difficulty maintaining regular sleep patterns because of rotating shifts and prolonged working hours. These conditions may contribute to cumulative fatigue and impaired recovery, potentially affecting nurses' physical health, psychological well-being, and quality of patient care. If left unaddressed, these issues may increase absenteeism, reduce workforce productivity, and negatively affect healthcare service delivery.

Given the essential role of nurses in maintaining safe and effective healthcare services, identifying factors that influence sleep quality is critically important. Understanding the relationship between workload and sleep quality may provide evidence to support workforce management strategies, staffing policies, and occupational health interventions in hospital settings. Therefore, this study aimed to examine the relationship between workload and sleep quality among medical-surgical ward nurses in a private hospital in Eastern Indonesia. The findings are expected to contribute to evidence-based interventions that support nurses' occupational well-being and improve the quality and safety of patient care.

METHOD

This study employed a quantitative cross-sectional design and was conducted in the medical-surgical ward of a private hospital in Eastern Indonesia, specifically in East Nusa Tenggara Province, from February to March 2025. The study population consisted of all nurses working in the medical-surgical inpatient ward during the study period, totaling 96 nurses. A non-probability sampling technique using a total sampling approach was applied, whereby all eligible nurses were invited to participate. The inclusion criteria were nurses who worked in the medical-surgical ward, had been employed for at least six months, were actively working during the data collection period, and agreed to participate by providing informed consent. Nurses who were on leave, absent, or undergoing medical treatment during the data collection period were excluded. Since all eligible nurses agreed to participate, the final sample consisted of 96 respondents. Data were collected using structured self-administered questionnaires consisting of three sections: demographic characteristics, workload assessment, and sleep quality assessment. Demographic data included age, gender, educational level, marital status, and length of employment.

Workload was measured using the Workload Questionnaire developed by Elizar (2019). The instrument consists of 25 items rated on a four-point Likert scale ranging from strongly disagree to strongly agree. The questionnaire includes four favorable items (16, 17, 20, and 21) and 21 unfavorable items (1–15, 18–19, and 22–25). Favorable items were scored from 1 to 4, whereas unfavorable items were reverse-scored. Higher total scores indicated higher perceived workload. Previous validity testing involving 50 respondents demonstrated that all 25 items were valid, with item-total correlation coefficients exceeding the critical r-value of 0.279. Reliability testing yielded a Cronbach's alpha coefficient of 0.939, indicating excellent internal consistency (Elizar, 2019).

Sleep quality was assessed using the Indonesian version of the Pittsburgh Sleep Quality Index (PSQI), translated and validated by Ratnasari (2016). The PSQI consists of 18 self-rated items grouped into seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Each component is scored on a scale ranging from 0 to 3, producing a global score between 0 and 21. A global PSQI score of ≤5 indicates good sleep quality, whereas a score of >5 indicates poor sleep quality. Validity testing of the Indonesian PSQI conducted among 30 respondents demonstrated item correlation coefficients ranging from 0.365 to 0.733, exceeding the critical r-value of 0.361. Reliability analysis yielded a Cronbach's alpha coefficient of 0.741, indicating acceptable internal consistency.

Data collection was conducted after obtaining approval from hospital management and ethical clearance from the Ethics Committee of the Faculty of Nursing, Universitas Pelita Harapan. Eligible participants were informed about the study procedures and provided written informed consent before participation. Questionnaires were distributed directly to respondents during working hours and supervised by research assistants to ensure proper completion and maximize response rates. Completed questionnaires were checked for completeness and consistency before data entry.

Data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS) version 30. Univariate analysis was performed to describe respondents' demographic characteristics, workload levels, and sleep quality using frequencies and percentages. Bivariate analysis was conducted using the Chi-square test to examine the relationship between workload and sleep quality. Prior to the Chi-square analysis, the assumptions regarding expected cell frequencies were assessed to ensure that no more than 20% of cells had expected counts below five and that no cell had an expected count below one. Statistical significance was set at $p < 0.05$.

Ethical principles were strictly maintained throughout the study. Participation was entirely voluntary, and respondents retained the right to withdraw at any time without consequence. Participant anonymity was ensured through the use of identification codes rather than names. All collected data were kept confidential, securely stored, and used exclusively for research purposes.

RESULT

The demographic characteristics of respondents indicated that most nurses were within the productive age range, predominantly female, and held a professional nursing qualification (D4/S1 + Ners). Most respondents also had relatively short work experience, ranging from one to three years. Detailed demographic characteristics are presented in Table 1.

Table 1. Demographic Characteristics of Respondents (n=96)

Demographic Data	N	%
Age:		
22-28 years	36	37,50
29-35 years	44	45,83
36-42 years	16	16,67
Total	96	100
Gender:		
Male	10	10,42
Female	86	89,58
Total	96	100
Level Of Education:		
D3	14	14,58
D4/S1 + Ners	82	85,42
Total	96	100
Length of work:		
1-3 years	65	67,71
4-6 years	18	18,75
> 6 years	13	13,54
Total	96	100

The distribution of workload categories showed that the majority of nurses perceived their workload as heavy. This finding suggests that nurses working in the medical-surgical ward experienced considerable occupational demands. The distribution of workload levels is presented in Table 2.

Table 2. Workload Levels Among Medical-Surgical Ward Nurses (n=96)

Category	N	%
Heavy	56	58.30
Light	40	41.70
Total	96	100

The findings related to sleep quality revealed that most respondents experienced poor sleep quality. This result indicates that sleep disturbances were common among nurses working in the medical-surgical ward. Detailed results are presented in Table 3.

Table 3. Sleep Quality Data among Medical-Surgical Room Respondents (n=96)

Category	N	%
Poor	88	91.70
Good	8	8.30
Total	96	100

The bivariate analysis demonstrated a statistically significant association between workload and sleep quality among nurses. Nurses with heavier workloads were more likely to report poor sleep quality than those with lighter workloads. Detailed findings are presented in Table 4.

Table 4. Association Between Workload and Sleep Quality Among Nurses

Workload	Sleep Quality				P *value*
	Poor		Good		
	N	%	N	%	
Heavy	55	57.30	1	1.00	0,006
Light	33	34.40	7	7.30	
Total	88	91.70	8	8.30	

The Chi-square analysis revealed a statistically significant relationship between workload and sleep quality (p = 0.006). Among nurses with a heavy workload, 55 (98.2%) reported poor sleep quality, whereas 33 (82.5%) of those with a light workload reported poor sleep quality. The Phi coefficient value of 0.32 indicated a moderate association between workload and sleep quality, suggesting that heavier workloads were moderately associated with poorer sleep quality among nurses.

DISCUSSION

This study demonstrated a significant relationship between workload and sleep quality among nurses working in a medical-surgical ward at a private hospital in Eastern Indonesia. Nurses who experienced heavier workloads were more likely to report poor sleep quality, indicating that occupational demands may substantially affect nurses' physical and psychological recovery. These findings support previous studies suggesting that excessive workload contributes to fatigue, sleep disturbances, and reduced occupational well-being among nurses (Kakemam et al., 2021; Wijanarti et al.,2022).

Most respondents in this study were aged between 29 and 35 years, representing nurses in early to middle adulthood. At this stage, nurses are commonly expected to balance demanding professional responsibilities with personal and social obligations. Younger nurses may be particularly vulnerable to occupational stress because they are still adapting to clinical responsibilities while managing high expectations for performance and productivity. O'Hara & Reid (2024) reported that nurses under 35 years of age are more likely to experience burnout when exposed to excessive workloads. Similarly, Heijden et al. (2019) and Dall'Ora et al. (2020) found that younger nurses are at greater risk of fatigue and emotional exhaustion due to cumulative occupational demands. These conditions may reduce opportunities for adequate recovery and contribute to sleep disturbances.

The predominance of female nurses in this study reflects the demographic composition of the nursing workforce both nationally and globally. Although female nurses are often recognized for their strong interpersonal and caregiving abilities, they may also experience dual burdens associated with professional and domestic responsibilities. The combination of shift work, emotional labor, and family obligations may intensify fatigue and psychological stress, both of which are known contributors to poor sleep quality. Previous research has demonstrated that female healthcare workers are more likely to report sleep disturbances and work-related exhaustion, particularly in high-demand clinical settings (Rahim &

Irwansyah, 2021; Zhang et al., 2017).

An important finding of this study was the extremely high prevalence of poor sleep quality, with 91.7% of respondents categorized as having poor sleep quality. This proportion is considerably higher than that reported in several previous studies and may indicate substantial occupational strain within the study setting. Several contextual factors may explain this condition. Nurses in medical-surgical wards are frequently exposed to prolonged standing, continuous patient monitoring, emergency situations, high patient turnover, and extensive documentation requirements. These demands often reduce opportunities for adequate rest during and after shifts. In addition, rotating schedules and overtime work may disrupt circadian rhythms and impair physiological recovery processes (Oetelaar van den et al., 2020).

From a physiological perspective, chronic sleep deprivation activates stress-response mechanisms involving increased cortisol secretion, sympathetic nervous system activity, and inflammatory responses. Persistent circadian disruption may impair melatonin regulation, reduce sleep efficiency, and contribute to cumulative fatigue. Over time, inadequate sleep may negatively affect cognitive performance, concentration, decision-making ability, and emotional regulation. For nurses, these impairments are particularly concerning because clinical practice requires sustained vigilance, rapid judgment, and precise interventions. Sleep deprivation among nurses has also been associated with an increased risk of medication errors, reduced patient safety, occupational accidents, and lower quality of care (Chang, 2024; Ferri et al., 2016). Therefore, the high prevalence of poor sleep quality observed in this study should be considered not only an occupational health issue but also a patient safety concern.

The finding that more than half of the respondents experienced a heavy workload further supports the assumption that excessive occupational demands may contribute to impaired sleep quality. Heavy workload in nursing is not limited to physical tasks but also includes the cognitive and emotional burdens associated with patient care responsibilities. Nurses in medical-surgical wards must simultaneously manage clinical monitoring, multidisciplinary coordination, documentation, and emergency responses. When these demands exceed an individual's adaptive capacity, recovery time becomes insufficient, resulting in cumulative fatigue. According to the fatigue-recovery model, prolonged occupational demands without adequate recovery may lead to physical and mental exhaustion, thereby impairing sleep quality and overall well-being (Ivziku et al., 2024).

The statistically significant relationship identified between workload and sleep quality is consistent with previous evidence demonstrating that workload-related fatigue is a major determinant of sleep disturbances among nurses (Kakemam et al., 2021). Nurses experiencing heavier workloads may have difficulty achieving restorative sleep because persistent physical exhaustion and psychological stress interfere with normal sleep patterns. Furthermore, work-related stress may increase physiological arousal and delay the transition into deeper stages of sleep, resulting in fragmented and non-restorative sleep. This mechanism may explain why nurses with heavier workloads in this study were more likely to report poor sleep quality. Similar findings were reported by (Dall'Ora et al., 2020), who found that excessive workload, long working hours, and insufficient recovery time contribute significantly to fatigue, burnout, and sleep problems among nurses.

In addition, Stewart & Arora (2019) explained that occupational stress and sustained psychological demands can disrupt circadian rhythms and impair sleep duration and quality among healthcare workers. Moreover, (Lin et al., 2023) demonstrated that emotional exhaustion and work-related stress were strongly associated with insomnia symptoms and poor sleep quality among hospital nurses. Consistent with these findings, Booker et al. (2020) also reported that high workload and shift-related fatigue increased the risk of sleep disturbances and impaired recovery among nurses working in demanding clinical environments.

Interestingly, several nurses who reported lighter workloads also experienced poor sleep quality. This finding suggests that sleep quality is influenced by multiple interacting factors beyond workload alone. Shift rotation patterns, night-shift frequency, organizational support, psychosocial stress, lifestyle habits, and environmental factors may also contribute to sleep disturbances. Rotating shifts are particularly important because they disrupt circadian rhythms and alter the body's natural sleep–wake cycle, even when perceived workload is relatively low (Adrianti et al., 2024; Ferri et al., 2016). Consequently, improving sleep quality among nurses requires not only workload management but also broader organizational strategies that address scheduling systems, recovery periods, and occupational support.

Several limitations should be considered when interpreting the findings of this study. First, the cross-sectional design limits the ability to determine causal relationships between workload and sleep quality. Second, the study was conducted in a single private hospital in Eastern Indonesia, which may limit the generalizability of the findings to other healthcare settings. Third, this study primarily focused on workload and did not comprehensively examine other factors that may influence sleep quality, such as psychological stress, organizational climate, shift rotation frequency, and personal lifestyle behaviors. Despite these limitations, the study provides important evidence regarding the occupational health challenges experienced by nurses in medical-surgical settings and highlights the importance of workload management in maintaining nurses' well-being and ensuring patient safety.

CONCLUSION

This study demonstrated a significant relationship between workload and sleep quality among nurses working in the medical-surgical ward of a private hospital in Eastern Indonesia. Nurses experiencing heavier workloads were more likely to report poor sleep quality, indicating that excessive occupational demands may adversely affect nurses' physical recovery and psychological well-being. The high prevalence of poor sleep quality identified in this study highlights an important occupational health concern in hospital settings. Inadequate sleep among nurses may impair concentration, clinical decision-making, emotional regulation, and work performance, which may ultimately compromise patient safety and the quality of care. These findings emphasize the importance of implementing effective workload management strategies, adequate staffing allocation, structured rest periods, and healthier shift-scheduling systems to support nurses' well-being and optimize healthcare service quality. Future research should involve multicenter settings, longitudinal designs, and additional organizational and psychosocial variables to provide a more comprehensive understanding of the factors influencing nurses' sleep quality.

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Original Research

Self-Management Behaviors among Adults with Hypertension in Coastal Communities: A Descriptive Observational Study

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ABSTRACT

Hypertension, often undetected until complications arise, is a leading cause of premature death, highlighting the importance of effective disease management. Adults living in coastal areas who actively manage their hypertension can reduce the risk of complications and improve their health and well-being. This study aimed to describe the self-management behaviors of adults with hypertension living in coastal areas. A descriptive observational approach was used in this study. A total of 287 adults with hypertension were included in this study based on the established inclusion criteria. Self-management behavior was assessed using the Indonesian version of the Hypertension Self-Management Behavior Questionnaire (HSMBQ), a 40-item instrument consisting of five components: self-integration, self-regulation, interaction with healthcare professionals and others, self-monitoring, and adherence to recommended regimens. The data were analyzed using descriptive statistical techniques and processed in JAMOVI, with overall scores classified as low, moderate, or high based on predetermined HSMBQ score ranges. The majority of adults with hypertension demonstrated moderate self-management behaviors (67.6%), followed by low (18.5%) and high (13.9%) levels. These findings highlight opportunities for nurses and primary healthcare providers to develop and implement culturally appropriate and family-centered interventions targeting specific self-management domains to support improved blood pressure control and overall health outcomes among coastal populations, particularly those in the low and moderate categories.

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INTRODUCTION

WHO estimates that 1.28 billion adults aged 30–79 years worldwide have hypertension, with the majority (two-thirds) living in low- and middle-income countries (WHO, 2023). Hypertension also poses a significant public health burden in Indonesia, ranking as the second leading cause of disability among individuals aged 15 years and older. According to the Indonesian Health Survey (SKI), the prevalence of hypertension in Indonesia has reached 30.8% among adults aged 18 years and older, with North Kalimantan ranking 12th nationally (Kemenkes RI, 2023). Data from the Tarakan City Health Office showed that the number of productive-age individuals with hypertension increased from 9,237 in 2022 to 12,238 in 2023, with an average of 1,020 cases reported per month in 2023.

The population of Tarakan Island is distributed across both rural and urban coastal areas (Iqbal et al., 2024; Pratiwi, 2023; Sidik, 2022). Coastal areas have unique environmental characteristics, including dependence on seafood and exposure to salt water, which influence community dietary patterns and lifestyles. Coastal communities face distinct challenges and opportunities in managing hypertension, particularly across urban and rural settings. Although urban areas may provide better access to healthcare services, stress and unhealthy dietary habits may affect blood pressure self-management behaviors (Ibrahim, 2018). In contrast, rural communities may have limited access to healthcare services; however, they often maintain simpler lifestyles and rely on natural resources to meet their daily needs. The habitual consumption of salty seafood is one of the risk factors that may contribute to poor self-management among individuals with hypertension (Appiah et al., 2021; Sari & Susilawati, 2022). These environmental and social characteristics of coastal areas can directly influence how individuals manage chronic conditions such as hypertension.

Self-management behavior plays an important role in health management, including diet, physical activity, and medication adherence, particularly among individuals with chronic diseases such as hypertension (Li et al., 2020; Zhao et al., 2020). According to WHO (2022), improving self-management behaviors can reduce complications and improve patients' quality of life. Hypertension remains a major cause of morbidity and premature mortality worldwide (Islam et al., 2023; WHO, 2023), making effective self-management increasingly important. Despite the unique environmental and lifestyle characteristics of coastal areas, evidence regarding how individuals with hypertension in these settings manage their condition remains limited.

Understanding the self-management behaviors of individuals with hypertension in coastal areas may help healthcare providers and policymakers develop more effective interventions. This study is expected to contribute to public health efforts, particularly in the management of hypertension in coastal areas that face unique challenges. The findings may also serve as a basis for developing health programs that are better tailored to the needs of coastal communities. Therefore, this study aimed to describe the self-management behaviors of adults with hypertension living in coastal areas.

METHOD

This quantitative study employed a descriptive observational approach. The study aimed to describe the self-management behaviors of adults with hypertension living in the coastal areas of Tarakan Island. Respondents were recruited from all six primary health centers (Puskesmas/Pusat Kesehatan Masyarakat) on Tarakan Island. Using the Slovin formula with a margin of error of 0.05 and a 95% confidence level, a sample of 287 respondents was obtained from a population of 1,020. Sample size can be determined using Slovin's formula when the population is known and finite, the confidence level ranges from approximately 87% to 99%, and the researcher has insufficient knowledge of the population characteristics or behavioral distribution to determine the optimal sample size (Adhikari, 2021; Majdina et al., 2024). Proportional calculations were then performed to determine the number of respondents from each primary health center, and a quota sampling technique was applied.

Respondents were recruited using a quota sampling technique. The inclusion criteria were adults with hypertension aged 19–59 years, regardless of blood pressure control status or medication use. Additional criteria included having lived in Tarakan for at least six months and having no history of speech or mental disorders. Quota sampling is a non-probability sampling method in which participants are selected according to predetermined criteria based on a specified quota (Hossan et al., 2023; Mukti, 2025). It can be conducted proportionally or non-proportionally (Hossan et al., 2023). Although quotas ensure that specific population characteristics are represented in the sample, participant selection within subgroups remains non-random and is generally based on availability (Ahmed, 2024). In this study, respondents were recruited from patients who visited the community health centers and met the inclusion criteria until the quota for each primary health center had been fulfilled. The quota for each center had been determined proportionally in advance. This technique was selected due to limitations in time and cost.

Data were collected using the Hypertension Self-Management Behavior Questionnaire (HSMBQ), a Likert-scale instrument modified by Akhter (2010) from the Diabetes Self-Management Instrument developed by Lin et al. (2008). The validity and reliability of the HSMBQ were initially tested in Bangladesh by Akhter (2010). The questionnaire consists of 40 favorable statements grouped into five self-management components: self-regulation (13 items), self-integration (9 items), interaction with healthcare professionals (9 items), blood pressure monitoring (4 items), and adherence to recommended regimens (5 items). The total self-management score was calculated using cut-off points derived from the mean and standard deviation: "high" if the score > mean+SD, "moderate" if mean-SD ≤ score ≤ mean+SD, and "low" if the score < mean-SD (Hidayat & Hastuti, 2016). Accordingly, self-management was classified as high if the score exceeded 149.5, moderate if the score ranged from 114.5 to 149.5, and low if the score was below 114.5. The same method was used to determine the cut-off points for each self-management component based on the mean and standard deviation of the respective component scores.

The questionnaire was translated into Indonesian by an expert using the back-translation method. Validity and reliability testing were subsequently conducted by Hidayat and Hastuti (2016). Pearson's r values ranging from 0.375 to 0.781 indicated that the Indonesian version of the HSMBQ was valid. The Cronbach's alpha coefficient was 0.949, indicating excellent reliability (Hidayat & Hastuti, 2016; Riyanto, 2022).

Data were collected from all primary health centers on Tarakan Island over a three-month period from June to August 2024 using the HSMBQ questionnaire. The questionnaire was integrated into a Google Form by the researcher. Before participation, eligible adults with hypertension were provided with information about the study and asked to sign an informed consent form if they agreed to participate. Ethical approval for this study was obtained under No. 084/KEPK-FIKES UBT/VIII/2024. Research assistants conducted interviews using the questionnaire provided through Google Forms and recorded respondents' answers accordingly. After all sections had been completed, the research assistants submitted the questionnaire. The researcher then reviewed all responses to ensure completeness.

The data were processed using JAMOVI software (Navarro & Foxcroft, 2025; The jamovi project, 2024). Responses were categorized according to the HSMBQ classification criteria. Data analysis consisted of univariate analysis using descriptive statistical techniques in JAMOVI to generate the frequency distribution of demographic characteristics and self-management behaviors.

RESULT

The mean age of the respondents was 51.52 years, with an age range of 24–59 years. The majority of respondents had a high school education (32.1%) and were housewives (49.8%). Furthermore, nearly half of the respondents lived in urban areas (47.4%), followed by suburban (38.7%) and rural areas (13.9%). More than half of the respondents had never smoked (83.3%) and had never consumed alcohol (95.5%). Table 1 presents the demographic characteristics of the respondents.

Table 1. Respondent characteristics (n=287)

Characteristic	Frequency (n)	Percentage (%)
Age		
24-59 (mean = 51.5) (SD = 6.77)	287	100.0
Gender		
Female	193	67.2
Male	94	32.8
Educational Background		
Bachelor’s Degree	25	8.7
Diploma (3-year program)	1	0.3
Senior High School	92	32.1
Junior High School	55	19.2
Elementary school	84	29.3
No Formal Education	30	10.5
Occupation		
Domestic worker (housewives)	143	49.8
Entrepreneur	44	15.3
Fisherman	14	4.9
Farmer	8	2.8
Teacher	12	4.2
Retired	4	1.4
Laborer	12	4.2
Driver	2	0.7
Employee	11	3.8
No work	19	6.6

Others	18	6.3
Domicile		
Urban	136	47.4
Sub urban	111	38.7
Rural	40	13.9
History of smoking		
Never	239	83.3
Former Smoker (Quit ≤ 1 Year Ago)	5	1.7
Former Smoker (Quit > 1 to 5 Years Ago)	5	1.7
Former Smoker (Quit ≥ 5 Years Ago)	14	4.9
Current Smoker	24	8.4
History of Alcohol Consumption		
Never	274	95.5
Former Drinker (Quit ≤ 1 Year Ago)	1	0.3
Former Drinker (Quit > 1 to 5 Years Ago)	5	1.7
Former Drinker (Quit ≥ 5 Years Ago)	5	1.7
Current Drinker	2	0.7
Heading level	Example	Font size and style
Title (centered)	**Core**	12 point, bold
Table Content		10 point

Descriptive analysis conducted using JAMOVI indicated that self-management behavior among adults with hypertension was predominantly categorized as moderate (67.6%), followed by low (18.5%) and high (13.9%). Figure 1 presents the complete results.

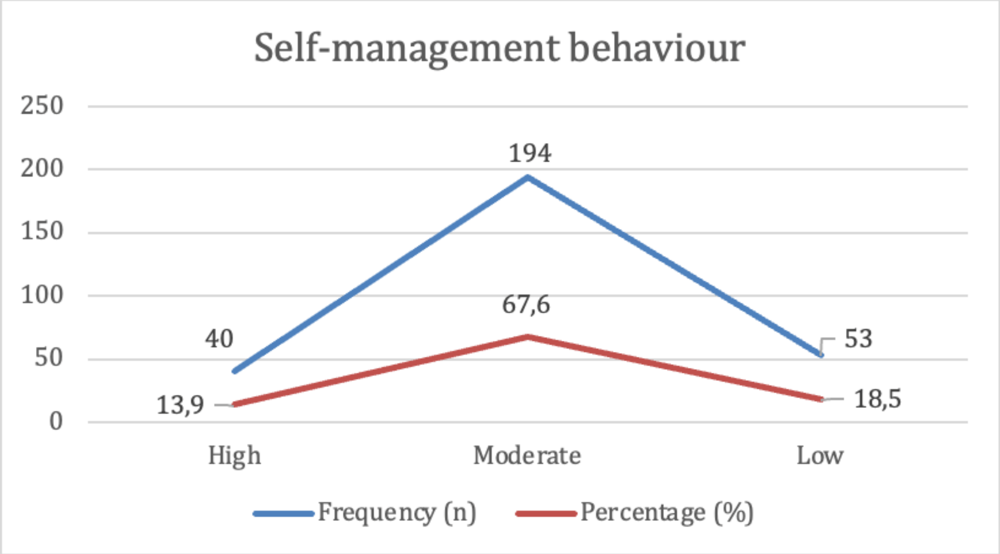

Fig. 1. Self-management behavior of adults with hypertension (n=287)

The HSMBQ consists of five components. For each component, the majority of respondents were categorized as having a moderate level of self-management behavior, including 210 respondents (73.2%) for self-integration, 190 respondents (66.2%) for self-regulation, 175 respondents (61.0%) for interaction with healthcare professionals and significant others, 198 respondents (69.0%) for self-monitoring, and 247 respondents (86.1%) for adherence to the recommended regimen. Table 2 presents the results for each component.

Table 2. An overview of the five components of self-management behavior (n=287)

Component	Level	Frequency (n)	Percentage (%)
Self-integration (Aligning personal beliefs and lifestyle with hypertension management to support overall health and treatment adherence)	High	25	8.7
	Moderate	210	73.2
	Low	52	18.1
Self-regulation (The ability to control and adapt behaviors and emotions to maintain effective hypertension management)	High	58	20.2
	Moderate	190	66.2
	Low	39	13.6
Interaction with health professionals & significant others (Engaging with healthcare providers and support networks to enhance motivation and adherence to treatment)	High	57	19.9
	Moderate	175	61.0
	Low	55	19.2
Self-monitoring (Regularly tracking blood pressure and related health indicators to inform management decisions)	High	42	14.6
	Moderate	198	69.0
	Low	47	16.4
Adherence to recommended regimen (Consistently following prescribed medications and lifestyle changes to control blood pressure effectively)	High	2	0.7
	Moderate	247	86.1
	Low	38	13.2

DISCUSSION

The results of this study indicate that most adults with hypertension in coastal communities have moderate levels of self-management behavior (67.6%), while the proportions with low and high levels are relatively smaller. Analysis of the five core components of self-management showed that all components were also categorized as moderate. This pattern suggests that patients have begun to integrate hypertension management into their daily lives but have not yet done so consistently across all domains. As a fundamental component of self-management, self-integration reflects the extent to which patients incorporate hypertension management into their daily routines.

Self-integration describes patients' behaviors in incorporating hypertension management into their daily routines, such as regulating food and beverage portions, managing stress, exercising, and maintaining adequate rest. Lifestyle modification is increasingly recognized as a first-line intervention in hypertension management, as it can significantly lower blood pressure and improve overall cardiovascular health (Hiremath et al., 2025). However, in this study, the proportion of high-level behaviors in the self-integration component was the lowest, indicating that only a small proportion of respondents consistently implemented all aspects of a healthy lifestyle. Most respondents fell into the moderate category, primarily characterized by low levels of physical activity to maintain weight and health. The predominance of female respondents, particularly housewives, may partly explain this pattern. Previous studies have shown that domestic responsibilities often limit self-control over diet, exercise, and rest, thereby reducing the intention and ability to adopt healthy behaviors (Konlan & Shin, 2023). In the low-level behavior group, almost all aspects of self-integration were rarely or never practiced. However, an interesting finding was the consistency of non-smoking behavior and minimal alcohol consumption across all behavioral categories. This finding is consistent with the characteristics of the respondents, who were predominantly female, as well as the demographic data showing low rates of smoking and alcohol consumption. Studies in Indonesia have also reported that women tend to avoid smoking and alcohol consumption, despite facing challenges related to physical activity and weight management (Kurnia et al., 2023; Santosa et al., 2020). In addition to integrating hypertension management into daily routines, self-management is also largely influenced by self-regulation, which refers to patients' ability to direct and adjust their own behavior.

Self-regulation is an internal process of setting goals, planning, self-monitoring, and adjusting behavior so that actions remain consistent with blood pressure targets, and it is one of the key components of self-management (Asseggaf et al., 2025; Peng et al., 2024). In this study, respondents in the moderate and high categories showed similar patterns in this component, as they tended to perform most aspects of self-regulation. However, gaps remained in understanding and managing symptoms associated with low blood pressure. One important aspect of self-regulation is patients' knowledge of high and low blood pressure, which serves as a basis for assessing their physical condition. Understanding hypertension, treatment targets, and related behaviors strongly predicts self-care, particularly home-based self-care (Asseggaf et al., 2025; Konlan & Shin, 2023). In the low-behavior group, almost all aspects of self-regulation were rarely or never performed. This finding is consistent with research in Malang, which showed that 85% of patients had low self-regulation (Safitri et al., 2024). Beyond patients' internal capacity, interactions with healthcare professionals and the social environment also play a crucial role in supporting self-management.

This component describes interactions between patients, healthcare professionals, and the surrounding environment in managing hypertension, such as discussions with healthcare professionals or people around them and visits to healthcare facilities. The distribution of high-level behaviors was generally consistent with active involvement of healthcare professionals and support from people around the patients in implementing hypertension self-management. Support from healthcare professionals, social support, and family support have been shown to be strongly associated with better blood pressure control and higher levels of self-management (De Sales et al., 2025; Li et al., 2025; Świątoniowska-Lonc et al., 2020). In contrast, respondents in the moderate category tended not to involve non-medical individuals in managing their hypertension, such as seeking help from friends, neighbours, or other patients to better understand or control their condition. Meanwhile, respondents in the low category showed even less involvement with healthcare professionals and the surrounding community. Individuals with moderate social support are 2.23 times more likely to have poor hypertension self-care practices than those with high social support (Jariyasakulwong et al., 2024). Interestingly, not all components showed marked differences across behavioral levels.

In this study, two components showed similar patterns among respondents in the high and moderate categories. In terms of adherence to the recommended regimen (following healthcare providers' advice and taking medications) and blood pressure monitoring, most aspects of these behaviors were consistently performed in both groups. This may be related to the predominance of respondents living in suburban and urban areas, where access to healthcare services tends to be better. Previous studies have shown that rural residents tend to have lower medication adherence than urban residents (Konlan & Shin, 2023). In the low category, adherence and blood pressure monitoring remained inconsistent, particularly regarding the timely use of medication and the frequency of blood pressure monitoring.

Overall, the predominance of moderate levels of self-management behavior suggests that adults with hypertension in coastal communities have established basic self-care practices but have not yet fully integrated and sustained them across all domains. This finding highlights that hypertension management is not solely a matter of medication adherence but rather a multidimensional process involving lifestyle modification, self-regulation, social support, and ongoing monitoring. Therefore, multifaceted interventions, including education provided by healthcare professionals, healthy lifestyle support, regular monitoring, and strengthening social networks, are important for encouraging the transition from moderate to optimal and sustainable self-management (Abdalla et al., 2023). These findings also highlight the need to develop integrated and context-specific hypertension management programs so that improvements in self-management behaviors can contribute to long-term blood pressure control.

Several limitations should be considered when interpreting these findings. The descriptive observational design limits the ability to capture changes in self-management behaviors over time, and the use of self-reported data may introduce social desirability bias. In addition, focusing on a specific coastal population may limit the generalizability of the findings, although similarities with findings from other coastal settings suggest shared patterns. This study also used a quota sampling technique, which has limitations in generalizing findings to the broader population and may introduce selection bias. Patients who were willing to participate may differ from those who were not, and patients who visited the Puskesmas during the data collection period may differ from those who did not. Therefore, the findings are applicable only to the population from which the sample was drawn and to individuals with characteristics similar to those of the study participants, rather than to all patients with hypertension. Future studies should consider using longitudinal designs and probability sampling techniques to observe changes in self-management behaviors over time. Future researchers may also develop culturally tailored interventions that integrate all components of the HSMBQ, including digital health tools, community involvement, and family support, to strengthen the evidence for effective hypertension management and reduce morbidity and mortality in coastal populations.

CONCLUSION

Most adults with hypertension in coastal communities demonstrate moderate self-management behaviors across all HSMBQ domains. As a descriptive study, these findings do not establish causal relationships but provide an important overview of current self-management practices in this population. The consistently moderate levels observed indicate considerable room for improvement and highlight the need for comprehensive and culturally sensitive support strategies. Nurses and primary healthcare (PHC) providers are well positioned to play a central role in strengthening hypertension self-management through patient education, routine assessment of self-care behaviors, and counseling tailored to coastal lifestyles and cultural practices. Integrating family involvement and community-based education into routine care may further support sustained behavior change and contribute to improved blood pressure control and overall well-being among adults with hypertension in coastal communities.

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Original Research

Effect of Saluang Music on Systolic Blood Pressure And Fatigue in Patients with Chronic Kidney Disease Undergoing Hemodialysis

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ABSTRACT

Chronic kidney disease (CKD) is a progressive and irreversible condition that, in advanced stages, requires kidney replacement therapy such as hemodialysis. Patients undergoing hemodialysis frequently experience complications, including hypertension, hypotension, and fatigue. Non-pharmacological interventions, such as traditional instrumental music therapy, may help alleviate these symptoms. This study aimed to examine the effect of saluang, a traditional Indonesian instrumental music, on systolic blood pressure and fatigue in patients with chronic kidney disease undergoing hemodialysis. This pre-experimental study employed a one-group pre-test–post-test design involving 20 participants selected through purposive sampling. The intervention consisted of listening to saluang music for 30 minutes per session over five sessions during hemodialysis. Data were analyzed using repeated-measures ANOVA. The mean fatigue score decreased from 41.50 to 37.45 ($p < 0.001$), and the mean systolic blood pressure decreased from 177.50 mmHg to 172.55 mmHg ($p < 0.001$). These findings indicate that repeated exposure to saluang music was associated with reductions in fatigue scores and systolic blood pressure among patients undergoing hemodialysis. However, further studies with larger sample sizes and control groups are needed to confirm these findings. Saluang music may be considered a complementary non-pharmacological intervention in nursing care for patients undergoing hemodialysis.

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INTRODUCTION

Chronic kidney disease (CKD) is characterized by a gradual and progressive decline in kidney function, resulting in the kidneys' inability to regulate fluid, electrolyte, and toxin levels in the body (Wandile, 2023). This condition often develops insidiously over several years and frequently remains asymptomatic in its early stages (Black & Hawks, 2022). In advanced stages, CKD requires kidney replacement therapy, such as hemodialysis (Bello et al., 2022).

Globally, CKD represents a major public health burden due to its associated complications and adverse effects on quality of life. In Indonesia, the prevalence of CKD among individuals aged ≥15 years increased from 0.2% in 2013 to 0.38% in 2018, including in West Sumatra (Badan Penelitian dan Pengembangan Kesehatan, 2018). Although a slight decline was reported in 2023, this may reflect differences in survey methodology rather than a true reduction in disease burden (Badan Kebijakan Pembangunan Kesehatan, 2023). line with this trend, the proportion of patients undergoing hemodialysis increased from 19.3% (2,849 individuals) in 2018 to 21.1% in 2023 (Badan Kebijakan Pembangunan Kesehatan, 2023; Badan Penelitian dan Pengembangan Kesehatan, 2018).

Hemodialysis, while life-sustaining, is associated with various complications, including hypertension, hypotension, and fatigue (Black & Hawks, 2022). These symptoms are commonly reported among patients undergoing hemodialysis and may negatively affect functional status, self-care ability, and quality of life (Wahyudi et al., 2022). Previous studies have shown that fatigue is highly prevalent among patients receiving hemodialysis and is associated with blood pressure fluctuations and adverse clinical outcomes (Debnath et al., 2021; Musniati et al., 2020).

Non-pharmacological interventions, such as music therapy, have been widely explored to manage symptoms in clinical settings. Music therapy may promote relaxation, reduce stress, and modulate physiological responses through mechanisms including autonomic nervous system regulation, distraction, and emotional engagement (Li et al., 2021; Rachmawati et al., 2021). Instrumental music, in particular, has been shown to facilitate relaxation and improve psychological well-being (Witte et al., 2022).

Traditional instrumental music offers additional cultural relevance that may enhance its therapeutic effects. Several studies conducted in Indonesia have demonstrated that traditional music can reduce pain, anxiety, and blood pressure in various patient populations (Damayanti et al., 2019; Handayani et al., 2018; Nurhidayati et al., 2020; Rahman et al., 2018; Supriadi et al., 2015; Wahyuningsih et al., 2020; Wulan & Apriliyasari, 2020). However, these findings are generally not specific to particular traditional instruments or clinical settings.

Saluang, a traditional Minangkabau bamboo flute from West Sumatra, produces distinctive melodic patterns that are often associated with relaxation and emotional expression (Ediwar et al., 2018). Its slow tempo and repetitive tonal structure may contribute to physiological calming effects. Previous studies have reported that saluang music can reduce stress among patients with breast cancer and type 2 diabetes mellitus (Sastra & Reni, 2022). However, despite the growing evidence supporting traditional music therapy, no studies have specifically examined the effect of saluang music on systolic blood pressure and fatigue among patients with CKD undergoing hemodialysis. Therefore, this study aimed to examine the effect of saluang music on systolic blood pressure and fatigue in patients with CKD undergoing hemodialysis.

METHOD

A one-group pre-test–post-test design was used to evaluate the effect of saluang music on systolic blood pressure and fatigue among patients with chronic kidney disease (CKD) undergoing hemodialysis. The study was conducted in the hemodialysis unit of a public hospital in West Sumatra, Indonesia, from May 26 to June 14, 2023.

A total of 22 patients were recruited using purposive sampling to ensure that participants met specific clinical and procedural characteristics relevant to the intervention. The inclusion criteria were: undergoing hemodialysis twice weekly, aged 40–50 years, having no prior exposure to music therapy, and being cognitively able to participate. Patients with moderate-to-severe hearing or cognitive impairment, those who did not enjoy listening to music, and those with unstable clinical conditions were excluded. Of the 22 patients initially recruited, 2 were excluded: 1 declined to participate, and 1 had an unstable clinical condition. Therefore, 20 participants were included in the final analysis.

The intervention consisted of listening to standardized pre-recorded saluang music through headphones for 30 minutes per session during hemodialysis. All participants received the same set of music tracks with similar tempos and durations to ensure consistency. The intervention was administered five times over approximately 2–3 weeks in accordance with the participants' regular hemodialysis schedule (twice weekly). The music was played during the first half of each dialysis session, and participants were encouraged to remain in a comfortable position throughout the intervention. The volume was adjusted according to individual comfort levels.

Fatigue was assessed using the Fatigue Severity Scale (FSS), a 9-item instrument with scores ranging from 1 to 7, where higher scores indicate greater fatigue. The Indonesian version of the FSS has been reported to be a valid and reliable instrument with good internal consistency (Cronbach's alpha = 0.88) (Rifa'i et al., 2018). Systolic blood pressure was measured by trained nursing staff using a calibrated automated sphygmomanometer while patients were in the supine position. Baseline measurements were obtained prior to the first intervention session, and follow-up measurements were collected after each intervention session. The final post-test measurement was obtained after the fifth intervention session.

All participants provided written informed consent and were informed of their right to withdraw from the study at any time without penalty. Ethical approval was obtained from the Hospital Research Ethics Committee (IRB No. LB.02.02/5.7/277/2023). Data were analyzed using repeated-measures ANOVA in SPSS.

RESULT

Table 1. Characteristics of Patients with Chronic Kidney Disease Undergoing Hemodialysis (n=20)

Characteristics	Mean (SD)	Frequency (f)	%
Age	**45.75 (3.55)**		
Gender			
Male		**9**	**45.00**
Female		**11**	**55.00**

According to Table 1, the mean age of the participants was 45.75 years (SD = 3.55), and the majority were female (55%).

Table 2. Results of Repeated-Measures ANOVA for Systolic Blood Pressure (n=20)

Variables	Mean (SD)	p-value
Baseline systolic blood pressure (pre-test) (n = 20)	177.50 (4.30)	<0.001
After intervention session 1 (n = 20)	177.10 (5.23)	
After intervention session 2 (n = 20)	177.10 (5.23)	
After intervention session 3 (n = 20)	174.90 (4.67)	
After intervention session 4 (n = 20)	174.95 (3.94)	
After intervention session 5 (post-test) (n = 20)	172.55 (5.06)	

Table 2 shows that the mean systolic blood pressure (SBP) at baseline (pre-test), measured immediately before the first intervention session, was 177.50 mmHg (SD = 4.30). Following intervention session 1, the mean SBP was 177.10 mmHg (SD = 5.23), indicating only a slight change from baseline. SBP gradually decreased across subsequent intervention sessions, with minor fluctuations during the early sessions and a more noticeable decline after the third session. After intervention session 5 (post-test), the mean SBP reached 172.55 mmHg (SD = 5.06). Repeated-measures ANOVA demonstrated a statistically significant difference across the measurement points ($p < 0.001$). Overall, the mean SBP at the final measurement was approximately 5 mmHg lower than at baseline.

Table 3. Results of Repeated-Measures ANOVA for Fatigue Scores (n=20)

Variables	Mean (SD)	p-value
Baseline fatigue score (pre-test) (n = 20)	41.50 (4.69)	<0.001
After intervention session 1 (n = 20)	41.50 (4.69)	
After intervention session 2 (n = 20)	41.75 (4.39)	
After intervention session 3 (n = 20)	41.30 (4.34)	
After intervention session 4 (n = 20)	40.45 (4.22)	
After intervention session 5 (post-test) (n = 20)	37.45 (3.86)	

Table 3 shows that the mean fatigue score at baseline (pre-test), measured immediately before the first intervention session, was 41.50 (SD = 4.69). The fatigue score remained relatively stable during the first two intervention sessions, with mean scores of 41.50 (SD = 4.69) and 41.75 (SD = 4.39), respectively. A gradual decline was observed from intervention session 3 onward, reaching 40.45 (SD = 4.22) after intervention session 4 and 37.45 (SD = 3.86) after intervention session 5 (post-test). Repeated-measures ANOVA revealed a statistically significant difference across the measurement points ($p < 0.001$). Compared with baseline, the mean fatigue score at the final measurement was approximately 4 points lower.

DISCUSSION

The findings of this study suggest that systolic blood pressure and fatigue scores were lower following repeated exposure to saluang music among patients undergoing hemodialysis. These findings are consistent with previous studies demonstrating that music therapy can reduce fatigue and improve physiological parameters in patients undergoing hemodialysis (Wayunah et al., 2023). Furthermore, previous studies have shown that music therapy may help regulate blood pressure, alleviate anxiety, and improve overall well-being among individuals receiving hemodialysis (Hiremath et al., 2022; Karadağ & Karadakovan, 2015; Kutlu & Eren, 2014; Wu et al., 2021; Yangöz et al., 2025).

In the present study, the reduction in systolic blood pressure was approximately 5 mmHg. Although modest, this decrease may still be clinically meaningful, as even small reductions in systolic blood pressure have been associated with a lower risk of cardiovascular events (Ettehad et al., 2016; Whelton et al., 2018). Furthermore, the gradual decline observed across repeated sessions suggests a possible cumulative effect of the intervention. The reduction in fatigue observed in this study may also be clinically meaningful, considering that fatigue is a highly prevalent and debilitating symptom among patients undergoing hemodialysis. Persistent fatigue has been associated with impaired physical functioning, reduced treatment adherence, and poorer quality of life (Bossola et al., 2023). The progressive improvement in fatigue scores across sessions suggests that repeated exposure to music may provide sustained benefits. These findings are supported by previous studies indicating that music therapy can reduce fatigue and stress by promoting relaxation and enhancing psychological well-being (Bradt et al., 2021; Witte et al., 2022).

The underlying mechanisms of these effects may involve modulation of the autonomic nervous system (ANS) and neuroendocrine responses. Music has been reported to reduce activation of the hypothalamic–pituitary–adrenal axis and enhance parasympathetic activity, thereby promoting relaxation and physiological stability (Ding et al., 2025). In addition, music therapy has been shown to increase heart rate variability (HRV), an indicator of parasympathetic dominance, while reducing sympathetic nervous system activity. These physiological changes contribute to improved cardiovascular regulation and may help explain the reduction in systolic blood pressure observed in this study (Ding et al., 2025; Zhang et al., 2024).

The rhythmic and slow-tempo characteristics of saluang music may also facilitate entrainment processes, whereby physiological parameters such as heart rate, respiratory rate, and blood pressure synchronize with auditory stimuli. This synchronization may enhance relaxation responses and support emotional regulation, ultimately contributing to reduced stress and improved well-being (Saskovets et al., 2025). Beyond its physiological effects, music may influence psychological processes by regulating emotional responses, improving mood, and reducing anxiety through the activation of reward pathways (De Witte et al., 2025). This cognitive and emotional modulation may function as a distraction mechanism, redirecting patients' attention away from discomfort during hemodialysis and thereby reducing perceived fatigue.

Despite these promising findings, several factors should be considered when interpreting the results. Patients undergoing hemodialysis often receive antihypertensive medications and other treatments that may influence blood pressure and fatigue levels. Additionally, the use of headphones may have contributed to noise reduction and relaxation independently of the music itself. These potential confounding factors were not controlled in this study.

This study has several limitations, including a small sample size (n = 20), the absence of a control group, and a relatively short intervention period, which limit the ability to establish causality and generalize the findings. The one-group pre-test–post-test design also makes it difficult to distinguish the effects of the intervention from natural changes that may occur during hemodialysis sessions.

Nevertheless, these findings have important implications for nursing practice. Saluang music therapy may serve as a simple, low-cost, and culturally relevant complementary intervention to help manage fatigue and blood pressure during hemodialysis. Nurses may integrate this intervention into routine care by providing standardized music sessions while respecting patients' comfort and preferences. Future research should involve larger sample sizes, randomized controlled trials, and longer intervention periods to confirm these findings. Additionally, studies comparing different types of music or isolating the effects of auditory stimulation (e.g., music versus noise reduction) are recommended to further clarify the specific contribution of music therapy.

CONCLUSION

This study examined the effect of saluang, a traditional Indonesian instrumental music, on systolic blood pressure and fatigue among patients with chronic kidney disease (CKD) undergoing hemodialysis. The findings demonstrated statistically significant reductions in systolic blood pressure and fatigue following the intervention. However, given the small sample size and the absence of a control group, these findings should be interpreted with caution and considered preliminary.

Despite these limitations, saluang music therapy may represent a feasible complementary intervention in nursing practice. It is relatively low-cost, easy to implement using headphones, and does not require extensive training, making it suitable for integration into routine care in hemodialysis units. Future studies involving larger samples and randomized controlled trials are needed to confirm the effectiveness of this intervention. Further research is also recommended to explore the use of traditional instrumental music across different patient populations and clinical settings and to compare its effects with those of other non-pharmacological interventions.

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Original Research

Cognitive Status and Quality of Life Among Older Adults: Implications for the Development of an Interdisciplinary Home Visit Model

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ABSTRACT

Dementia and cognitive impairment are rapidly increasing worldwide, with more than 57 million cases globally and a projected rise in low- and middle-income countries. Indonesia ranks among the countries with the highest number of dementia cases in Southeast Asia, with Yogyakarta reporting a high proportion of older adults at risk. Despite this growing burden, community-based dementia care models remain limited, and most older adults rely primarily on family caregivers. This situation highlights an urgent need for approaches that not only address cognitive decline but also improve the quality of life (QoL) of older adults living in the community. This study aimed to determine the relationship between the severity of cognitive impairment and QoL among community-dwelling older adults and to provide preliminary evidence for the development of an interdisciplinary home visit model tailored to the Indonesian context. A correlational study was conducted involving 30 older adults aged ≥60 years living with their families in Yogyakarta. Cognitive status was assessed using the Mini-Mental State Examination (MMSE), and QoL was measured using the WHOQOL-BREF. Data were analyzed using Spearman's rank correlation. There was a significant relationship between the severity of dementia and QoL in the physical domain ($r_s = 0.428$; $p = 0.018$) and the environmental domain ($r_s = 0.440$; $p = 0.015$). These findings indicate that greater dementia severity was associated with lower QoL in the physical and environmental domains. The findings provide preliminary evidence supporting the development of an interdisciplinary home visit model in Indonesia, particularly one that integrates physical mobility support, environmental safety optimization, and family-centered care. Larger studies are recommended to strengthen this foundation before full model implementation.

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INTRODUCTION

Dementia is a general term for a group of diseases that affect memory, other cognitive abilities, and behavior, significantly interfering with an individual's ability to perform daily activities. Dementia is a leading cause of disability and dependence among older adults and is often associated with mental health disorders, particularly among those requiring long-term care (Cepoiu-martin et al., 2016; Tori et al., 2020). According to the World Health Organization, approximately 57 million people worldwide are living with dementia, more than 60% of whom reside in low- and middle-income countries. Nearly 10 million new cases are reported each year, making dementia the seventh leading cause of death and one of the major causes of disability and dependence among older adults globally (Alzeimer's Disease International, 2024; World Health Organization, 2025).

Indonesia is a low- and middle-income country with more than four million older adult people living with dementia (Hogervorst et al., 2021). The country ranks ninth globally in terms of the number of people with dementia (Law & Hu, 2025). The impact of this growing number is likely to be substantial, partly due to the limited availability of healthcare services and support for older adults, as well as the lack of dementia care policies and effective management strategies (Widyastuti et al., 2023). Most people with dementia in Indonesia are cared for by their families within the community (Farina et al., 2023). This situation may be more challenging than in high-income countries, where a wider range of care facilities, services, and community support systems are available (Mahendradhata, Y., Trisnantoro, L., Listyadewi, S., Soewondo, P., Marthias, T., Harimurti, P., & Prawira, 2017; Sari et al., 2024). Older adults with dementia require ongoing care, which may result in physical, emotional, and psychological burdens for both patients and caregivers and often leads to prolonged periods of stress (Alzeimer's Disease International, 2024; Arneliwati et al., 2025; Reed et al., 2017).

Older adults with dementia frequently experience a decline in quality of life due to the loss of independence. People with dementia also commonly report problems related to mobility and social support, both of which can affect quality of life (Rahardian & Juniwati, 2023). Increased physical activity has been shown to improve quality of life among people with dementia; however, older adults with dementia tend to have lower levels of physical activity than those without dementia (Jayakody & Arambepola, 2022). Delayed detection and management of dementia may further reduce the quality of life of older adults. This highlights the need for comprehensive interventions for older adults with dementia in Indonesia (Kenne Malaha et al., 2025). Declining cognitive status is generally associated with lower quality of life (QoL), affecting multiple domains. In the physical domain, cognitive decline may impair the ability to perform daily activities. In the psychological domain, it may contribute to depression, anxiety, and reduced life satisfaction. In the social domain, it may lead to decreased social participation, strained relationships with family members or caregivers, and feelings of isolation. In the environmental domain, worsening cognitive status increases the need for environmental support, including access to healthcare services, caregiver assistance, and home safety measures (Gopalakrishnan et al., 2024).

Older adults with dementia require long-term care supported by appropriate interventions and facilities. However, currently available services remain limited, particularly for individuals with more advanced dementia. Therefore, Yogyakarta was selected as the study location (Rahardian & Juniwati, 2023). Previous studies have suggested that integrating cognitive stimulation therapy into an interdisciplinary approach, combined with physical activity interventions, may provide more comprehensive and needs-based care (Elmiyanti & Salamung, 2023; Marinho et al., 2021; von Soest et al., 2020). Nevertheless, Indonesia still lacks community-based dementia care models that are adapted to local cultural, family, and environmental contexts. Evidence regarding the relationship between cognitive status and QoL is needed as a preliminary foundation for model development. Therefore, this study aimed to provide early empirical evidence that may support the development of an interdisciplinary home visit model for older adults with dementia in Indonesia.

METHOD

This study employed a correlational quantitative design. The researchers screened 45 older adults and identified 30 individuals who met the study criteria. Thirty older adults (≥60 years) living with their families in Yogyakarta were selected using purposive sampling. This sample size meets the minimum requirement for non-parametric correlation testing (≥30 participants). The inclusion criteria were: (a) aged ≥60 years; (b) able to participate in and complete the research instruments with or without assistance from a caregiver; (c) living with family in the community; and (d) both the older adults and their family members agreed to participate in the study. The exclusion criteria were: (a) experiencing a medical emergency; (b) family members and/or older adults who decided to withdraw from the study; and (c) experiencing special circumstances that prevented continued participation in the study.

His study utilized the Mini-Mental State Examination (MMSE) to assess cognitive impairment. The MMSE is a 30-point questionnaire commonly used in research and clinical settings to screen for cognitive impairment. It was developed by American psychiatrist Marshal F. Folstein and colleagues. MMSE scores are interpreted as normal (24–30), probable cognitive impairment (17–23), and definite cognitive impairment (0–16). The MMSE has demonstrated validity coefficients ranging from r = 0.357 to 0.102 and a Cronbach's alpha reliability coefficient of 0.763 (Thea et al., 2022). Quality of life was assessed using the WHOQOL-BREF, which consists of four domains: physical, psychological, social, and environmental. Developed by the World Health Organization, the instrument contains 26 self-report items in which respondents are asked to rate their condition using a five-point scale. In this study, the raw scores for each domain were transformed to a scale ranging from 0 to 100. Scores of ≤50 were categorized as poor quality of life, while scores of >50 were categorized as good quality of life. Previous studies have shown that the WHOQOL-BREF is a valid and reliable instrument for assessing quality of life among older adults, with validity coefficients ranging from 0.89 to 0.95 and reliability coefficients ranging from 0.66 to 0.87 (Ch Salim et al., 2007; Fridolin, Musthofa and Suryoputro, 2022).

Data collection was conducted directly by the research team through door-to-door home visits to assess cognitive impairment and quality of life among older adults from July to August 2025. The data were subsequently analyzed using Spearman's rank correlation test to examine the relationship between the two variables. The findings were then used as a basis for proposing a care model for older adults with dementia. Ethical approval for this study was obtained from the Health Research Ethics Committee (KEPK) of Bethesda Yakkum Institute of Health Sciences (No. 058/KEPK/02.01/VI/2025), issued on June 12, 2025, and valid until June 11, 2026.

RESULT

Table 1. MMSE Score and Quality of Life Score per Domain

MMSE	n	%	Quality of Life Scores	n	%
Normal (25-30)	15	33.3	Physical domain		
			Bad	1	2.2
			Fair	12	26.7
			Good	17	37.8
Mild (18-24)	19	42.2	Psychological domain Bad		
			Fair	1	2.2
			Good	14	31.1
				15	33.3
Moderate (0-17)	11	24.4	Social domain		
			Fair	11	24.4
			Good	17	37.8
			Excellent	2	4.4
			Environmental domain		
			Fair	9	20
			Good	20	44.4
			Excellent	1	2.2
Total	45	100		30	100

Table 1 shows that the majority of older adults had mild dementia, accounting for 19 respondents (42.2%). Older adults without dementia (normal cognitive status) were not included in this study. Quality of life was subsequently assessed among older adults with dementia. The results showed that, across all quality-of-life domains, most respondents were categorized as having a good quality of life. The physical domain was categorized as good in 37.8% of respondents, while the psychological and social domains were categorized as good in 33.3% and 37.8% of respondents, respectively. The environmental domain showed the highest proportion of respondents with good quality of life (44.4%).

Table 2. Characteristics of Respondents

Characteristics	**n**	**%**
Age (years)		

Characteristics	n	%
Older adult (60-74)	19	63.3
Old (75-90)	9	30
Very Old (>90)	2	6.7
Gender		
Male	5	16.7
Female	25	83.3
Occupation		
Still working	9	30
Retirement	21	70
Marital Status		
Marriage	15	50
Divorce	9	30
Widows/widowers	6	20
Education level		
None	4	13.3
Elementary school	14	46.7
Junior high school	4	13.3
Senior high school	7	23.3
College	1	3.3
Health conditions suffered		
Hypertension	10	33.3
Heart	2	6.7
Diabetes Mellitus	1	3.3
Multipathological	16	53.3
None	1	3.3
Social activities		
Posyandu	17	56.7
Religious	9	30
Arisan	3	10
Inactive	1	3.3
Sleep quality		
Very bad	19	63.3
Bad	11	36.7

Table 2 shows that the majority of respondents were aged 60–74 years (63.3%), female (83.3%), retired (70.0%), married and living with a spouse (50.0%), had an elementary school education (46.7%), had multiple chronic conditions (53.3%), were active in Posyandu activities (56.7%), and reported very poor sleep quality (63.3%).

Table 3. The correlation between severity of dementia and quality of life

Variable	Correlation Coefficient (r_s)	p-value	Interpretation
Dementia and QoL (physical domain)	0.428	0.018	There is a significant (moderate) relationship
Dementia and QoL (psychological domain)	0.222	0.238	Not significant
Dementia and QoL (social domain)	0.209	0.267	Not significant
Dementia and QoL (environmental domain)	0.440	0.015	There is a significant (moderate) relationship

Based on Table 3, there was a significant relationship between dementia severity and quality of life in the physical domain ($r_s = 0.428$; $p = 0.018$) and the environmental domain ($r_s = 0.440$; $p = 0.015$). These findings indicate that greater dementia severity was associated with lower quality of life in the physical and environmental domains. In contrast, the relationships between dementia severity and the psychological domain ($r_s = 0.222$; $p = 0.238$) and social domain ($r_s = 0.209$; $p = 0.267$) were not statistically significant.

Based on these findings, the researchers proposed a comprehensive care model for older adults with dementia that emphasizes the physical and environmental domains, which were significantly associated with dementia severity. Considering the complexity of dementia and its impact on quality of life, there is a need to develop an innovative yet feasible care model for older adults living with their families in the community. Nurses may collaborate with physiotherapists and social workers to address domains that are significantly affected by cognitive decline. Given the care needs of older adults with dementia, a proactive service model involving home visits may be an appropriate approach for community-based care.

DISCUSSION

Dementia is characterized by cognitive impairment, as reflected by Mini-Mental State Examination (MMSE) scores ranging from 0 to 24, indicating varying degrees of cognitive decline from mild to severe. Older adults with cognitive impairment showed changes in quality of life across the physical, psychological, social, and environmental domains (Table 3). These findings are consistent with recent studies reporting that cognitive decline is significantly associated with reduced ability to perform daily activities, increased dependence, and worsening physical health conditions, all of which directly affect the physical domain of quality of life (de Vugt & Dröes, 2020; Livingston et al., 2020). In the psychological domain, older adults with dementia often experience depression, anxiety, and emotional distress resulting from declines in memory and executive function, which may reduce their perceived well-being (Scharre, 2021). Furthermore, cognitive impairment may affect the social domain, as communication difficulties and behavioral changes can reduce social interaction, increase isolation, and decrease the social support received by older adults (de Vugt & Dröes, 2020; Goh et al., 2019). In the environmental domain, cognitive limitations may affect older adults' ability to access healthcare services, utilize environmental resources effectively, and maintain a sense of safety and independence at home (Au-Yeung et al., 2024). Thus, the findings of this study support existing evidence that dementia has a multidimensional impact on the quality of life of older adults and highlight the importance of comprehensive, sustainable, and interdisciplinary interventions.

Relationship between Dementia Severity and Physical Domain Quality of Life

The results showed a significant relationship between dementia severity and the physical domain of quality of life. Older adults with mild dementia had higher physical domain scores than those with moderate to severe dementia. This finding is consistent with Farina et al. (2024), who reported that cognitive decline is closely associated with reduced ability to perform activities of daily living (ADLs) and decreased motor function, which ultimately lowers physical quality of life. Declines in orientation, memory, and attention may limit older adults' ability to move independently, maintain personal hygiene, and adhere to health-related routines. Furthermore, these findings support those of Jayakody and Arambepola (2022), who found that the physical domain is often the first aspect of quality of life to decline among older adults with cognitive impairment in South Asian communities due to limited mobility and increased dependence on caregivers.

Physical activity may serve as a potential intervention for dementia and mild cognitive impairment by improving cognitive function (Venegas-Sanabria et al., 2022). Although physical activity may not directly improve cognitive function, it has been shown to enhance physical capabilities and motivation among people living with dementia (Telenius et al., 2020). Moderate physical activity has also been associated with a lower incidence of dementia among older adults (Markku et al., 2022). Encouraging physical activity before individuals reach older age may help reduce dementia risk and improve physical functioning later in life. This preventive approach highlights the importance of early intervention in promoting healthy aging.

Relationship with Psychological and Social Domains

The absence of a significant relationship between dementia severity and the psychological and social domains suggests that emotional and social well-being may be influenced more by external support than by cognitive function alone. Previous studies conducted during the COVID-19 pandemic showed that family support and spirituality played a greater role in maintaining the psychological well-being of older adults than medical or cognitive factors. This suggests that older adults who receive emotional support, feel valued, and remain involved in social activities may maintain a relatively good quality of life in the psychological and social domains despite cognitive decline (Sinaga et al., 2022).

Relationship with the Environmental Domain

The significant relationship between dementia severity and the environmental domain indicates that older adults with better cognitive function tend to be more adaptable, feel safer, and be more satisfied with their living environment. These findings are consistent with Da et al.(2025), who reported that environmental comfort, access to healthcare facilities, and community support are important determinants of quality of life among older adults with dementia. In the context of Yogyakarta, community support, Posyandu programs for older adults, and neighborhood-based social activities may also contribute to more positive perceptions of the living environment.

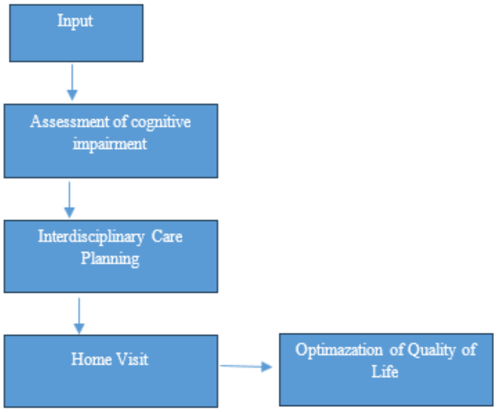
Interdisciplinary Home Visit Model

In healthcare settings, professionals from various disciplines work collaboratively to address patients' physical, psychological, and social needs. Interdisciplinary teams are more than a collection of specialists providing separate services; they work together toward shared goals and complement one another's expertise. Physicians, nurses, therapists, laboratory professionals, pharmacists, physiotherapists, and nutritionists collaborate to support optimal patient outcomes (Bosch & Mansell, 2015; VR Intening, Y Permina, 2022). Effective dementia management requires an interdisciplinary approach that extends beyond clinical professionals to include social workers and policy stakeholders. Their involvement is essential for strengthening prevention efforts, increasing public awareness, and supporting coordinated responses to the growing burden of dementia.

Interdisciplinary teams emphasize collaboration. Therefore, recognizing the contributions and expertise of each team member is essential. Such recognition helps team members feel valued, encourages participation, and promotes meaningful contributions. In addition, interdisciplinary teams should encourage patients to participate in decision-making processes to improve the quality of care. These teams provide patient-centered care by jointly developing, discussing, and implementing coordinated care plans with the active involvement of patients and their families (Bendowska & Baum, 2023; Warren & Warren, 2023).

Research conducted by Kartika et al.(2019) showed that home visits are one strategy used by healthcare professionals to improve access to healthcare services for older adults. Many older adults experience mobility limitations that make it difficult to access healthcare facilities. In addition, family support may be constrained by caregivers' work and daily responsibilities. Home visits improve service accessibility by reducing the need for travel and facilitating care delivery within the home. In areas with limited healthcare personnel, task shifting to social workers may represent a cost-effective strategy for enhancing dementia care (Alam et al., 2021).

This study was limited to older adults living in Yogyakarta, which restricts the generalizability of the findings, and the sample size was relatively small. Furthermore, the proposed interdisciplinary home visit model still requires the development of technical implementation guidelines. Based on the findings that the physical and environmental domains of quality of life were significantly associated with cognitive impairment, this study provides preliminary evidence for the development of an interdisciplinary home visit approach. The proposed model emphasizes coordinated roles among nurses, physiotherapists, and social workers in addressing mobility limitations, environmental safety, and caregiver support. The flowchart presented below illustrates the initial framework of the proposed model, which remains conceptual and requires further validation through future research.



Scheme 1. Interdisciplinary Home Visit Model (Preliminary)

CONCLUSION

There was a significant relationship between dementia severity and quality of life in the physical and environmental domains among older adults. These findings indicate that greater dementia severity was associated with lower quality of life in both domains. Based on these findings, an interdisciplinary home visit model was proposed. Given the complexity of dementia care, collaboration among healthcare professionals, social workers, and policymakers is needed to implement home visit models aimed at optimizing the quality of life of older adults with dementia.

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Original Research

Burnout and Adherence to Pressure Injury Prevention Guidelines Among ICU Nurses in a Teaching Referral Hospital

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ABSTRACT

Burnout is a major problem among intensive care nurses, yet its relationship with adherence to pressure injury prevention remains unclear, especially in Intensive Care Unit (ICU) settings. This study aimed to determine the association between burnout levels and adherence to pressure injury prevention guidelines among nurses working in intensive care units of a Type A teaching hospital. A cross-sectional study was conducted among 144 ICU nurses in a teaching referral hospital in Depok. Data were collected using the Questionnaire for Adherence to Recommendations for Pressure Injury Prevention (QARPPU) and the Maslach Burnout Inventory–Human Services Survey (MBI-HSS). Univariate analyses summarized respondent characteristics, and chi-square tests with Cramer's V examined the association between burnout and adherence. The findings revealed that 58.3% of ICU nurses met the predefined threshold for adherence to pressure injury prevention practices, while 45.8% reported a high level of burnout. There was a strong statistical association between burnout level and adherence to pressure injury prevention ($\chi^2 = 27.65$, $p < 0.001$), with a moderate effect size (Cramer's $V = 0.438$). This work highlights that burnout may be associated with patient safety outcomes, especially pressure injury prevention in the ICU. Thus, hospital management should make greater efforts to implement burnout mitigation strategies to improve ICU nurses' adherence to pressure injury prevention..

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INTRODUCTION

Pressure injuries are a common chronic wound frequently occurring in both inpatient and outpatient care. In Indonesia, the prevalence is generally between 3.6% and 27%, indicating a persistent clinical concern within health facilities (Amir, Lohrmann, et al., 2017; Amir, Tan, et al., 2017; Sari et al., 2019). Pressure injuries in hospitals are considered a major indicator of the quality of nursing care, especially in Intensive Care Units (ICUs). Seriously ill patients have a higher susceptibility to pressure injuries due to limited mobility, invasive devices, an unstable physiological condition, and long-term hospitalization (He et al., 2016; Khojastehfar et al., 2020). The incidence of pressure injuries not only reduces patients' quality of life but also increases treatment costs, prolongs hospital stay, and raises the institutional burden, which is an important indicator reflecting nursing performance (Tayyib et al., 2016; Yakupu et al., 2022).

There are several evidence-based nursing care practices, such as regular repositioning, skin moisture management, appropriate linen use, and risk assessments, that are proven in preventing pressure injury incidence (Mallah et al., 2015; Tayyib et al., 2016). However, this approach relies on the quality of nursing care, especially the adherence of nurses to pressure injury prevention guidelines. Reviewed studies reported that compliance with pressure injury prevention interventions is critical in reducing incidence, especially in intensive care settings (Khojastehfar et al., 2020).

The Job Demands-Resources (JD-R) theory offers insight to explain factors affecting nurses' adherence to clinical guidelines. This theory explains that high job demands, such as high workload, emotional stress, and complex patient care, may contribute to burnout, while adequate job resources may improve work performance and engagement (Montenegro Méndez et al., 2025). In this context, ICU settings have the potential to impose physical and psychological demands, which may reduce nurses' adherence.

It is difficult to ensure consistent compliance in ICU environments when clinical demands are high, emergencies occur more frequently, and workloads are also considerable. Additionally, these challenges are more pronounced in Type A teaching hospitals, where ICUs manage highly complex patients with multi-organ involvement, advanced life-support requirements, and rapid physiological deterioration (Tesema et al., 2021). The demanding clinical environment, along with the academic responsibilities of a teaching hospital, contributes to intense psychological pressure among ICU nurses. All these factors combine to increase the risk of burnout, characterized by emotional exhaustion, depersonalization, and a reduced sense of accomplishment (Li et al., 2024).

Burnout has been well documented to have a crucial impact on nursing performance by disrupting concentration, decreasing motivation, and lowering adherence to clinical standards. A number of studies have reported that burnout increases the likelihood of errors, reduces care quality, and weakens compliance with standard operating procedures (Li et al., 2024; Yestiana et al., 2019). Because pressure injury prevention depends on nurses' performance, the presence of burnout might critically influence nurses' compliance with prevention protocols.

However, despite the recognized impact of burnout on nursing performance, to date no study has investigated the relationship between the level of burnout among ICU nurses and pressure injury prevention guideline compliance within the Indonesian context. Most literature has predominantly focused on prevalence, risk factors, or general workload but has not considered how psychological factors, particularly burnout, may directly influence adherence in high-risk areas like the ICU (Alzahrani et al., 2024; Juanamasta et al., 2024; Kotb Basuony et al., 2023; Pappa & Dafogianni, 2020; Yestiana et al., 2019). This indicates a significant gap, as the prevention of pressure injury relies on the adherence of nurses to guidelines, which may be compromised when they experience burnout.

Moreover, ICU nurses in Indonesian Type A teaching hospitals work in highly demanding clinical and academic environments that may make them prone to physical and psychological exhaustion. This issue has not been adequately explored in previous studies. Understanding the association between burnout and adherence to pressure injury prevention is imperative to provide new evidence for developing strategies to reduce the incidence of pressure injuries in the ICU setting. The findings of this study may also be beneficial for nursing management, especially in anticipating burnout among nurses in ICU settings. Therefore, this study aimed to investigate whether burnout among nurses in the ICU is associated with compliance in the implementation of pressure injury prevention guidelines.

METHOD

Study design

This study is a quantitative study with a cross-sectional design.

Sample

This study included nurses who were placed in the ICU. Given the relatively limited number of nurses working in these specialized units, a total sampling strategy was employed. At the time of data collection, there were 144 nurses working in the ICU. All eligible nurses were invited to join the study.

Eligible participants were nurses who had been assigned to one of the critical care units for at least three months and provided written informed consent. Nurses were excluded if they were on extended leave, temporarily inactive during the data collection period, or currently enrolled in advanced academic training programs. All 144 nurses met the criteria and were recruited into the study.

Instrument

Pressure injury prevention adherence was measured using the Questionnaire for Adherence to Recommendations for Pressure Injury Prevention (QARPPU), which consists of 18 items (Moya-Suárez et al., 2017). This instrument had previously undergone translation and contextual adaptation for use within Indonesian clinical settings which has demonstrated satisfactory reliability with a Cronbach's alpha of 0.929 (Efendi et al., 2025). Participants reported how consistently they performed key preventive practices, including repositioning, skin care, linen management, and use of pressure-relieving devices. Higher scores indicated better adherence.

For analytical purposes, adherence was categorized into adequate adherence and inadequate adherence. To date, there has been no pre-determined standard cut-off score reported in previous study. Thus, the cut-off point was determined using the mean score of the sample because the adherence variable demonstrated a normal distribution. In this study, a score of 69 served as the cut-off, with scores $\geq$ 69 classified as adequate adherence and scores $<$ 69 classified as inadequate adherence.

Burnout was evaluated using the Maslach Burnout Inventory–Human Services Survey (MBI-HSS), a rigorously validated 22-item instrument widely applied in studies involving healthcare workers (Daryanto et al., 2022; Maslach et al., 1997). The scale comprises three subdimensions: Emotional Exhaustion (EE, 9 items), Depersonalization (DP, 5 items), and Personal Accomplishment (PA, 8 items), each scored according to the frequency of burnout-related experiences in routine clinical practice. Consistent with the MBI-HSS interpretive guidelines, burnout risk categories were classified into high-risk and low-risk. Participants were categorized as high-risk if they scored $\geq$27 on the EE dimension or $\geq$10 on the DP dimension, thresholds that have been internationally recognized as indicative of clinically meaningful burnout risk (Maslach et al., 1997). In addition to these main variables, several respondent characteristics were collected. Age was obtained through self-report and categorized into three groups. Gender, marital status, and highest educational attainment were recorded as categorical variables. Participants also reported their monthly income, which was documented in categories consistent with institutional standards. Work-related characteristics included duration of employment (categorized into three groups), type of intensive care unit where participants worked: ICU, ICU transition unit, Pediatric Intensive Care Unit (PICU), Neonatal Intensive Care Unit (NICU), or Intensive Cardiac Care Unit (ICCU), and history of wound care training, measured by asking whether respondents had ever attended wound-related professional development programs. All demographic and occupational variables were collected using structured questions within the same questionnaire packet.

Data collection

Data collection was coordinated by the researcher in collaboration with unit managers to ensure minimal disruption to clinical operations. Participants completed the questionnaires anonymously during designated periods within their work shifts. This study was conducted in a Type A teaching hospital located in West Java, Indonesia. This hospital is an academic medical center with a high case mix index and a complex critical care population. The study was carried out across five intensive care units; ICU, PICU, NICU, ICCU and ICU transitions. The data collection process was conducted between 13 and 28 November 2025.

Data analysis

Data analysis was conducted using IBM SPSS Statistics version 27. Univariate procedures were employed to summarize the characteristics of the study variables, including the calculation of proportions for all categorical measures. Bivariate analyses were subsequently performed to examine associations between independent variables and the primary outcomes. The Pearson chi-square test was used to assess statistical significance, accompanied by Cramer's V to quantify the strength of association for nominal-level variables. All analyses adhered to a two-tailed significance threshold of $p < 0.05$.

Ethical consideration

Ethical approval for the study was granted by the hospital's Research Ethics Committee prior to participant recruitment, with the approval number S-248/KETLIT/RSUI/X/2025.

RESULT

Table 1. Characteristics of respondents (N = 144)

Variable	Category	n	%
Gender	Male	13	9.0
	Female	131	91.0
Age	18–25 years	57	39.6
	26–59 years	87	60.4
Economic Status	≤ IDR 5,195,000	119	82.6
	> IDR 5,195,000	25	17.4
Marital Status	Married	27	18.8
	Not Married	116	80.6
	Widowed/Divorced	1	0.7
Educational Attainment	Diploma (D3)	10	6.9

	Bachelor of Nursing (Ners)	132	91.7
	Master/Specialist	2	1.4
Length of Work Experience	> 3 years	50	34.7
	1–2 years	15	10.4
	2–12 months	79	54.9
Type of Intensive Care Unit	Adult ICU	76	52.8
	ICCU	14	9.7
	NICU	29	20.1
	PICU	11	7.6
	Transitional ICU	14	9.7
Wound Care Training History	Ever attended	15	10.4
	Never attended	129	89.6

Notes: ICU: Intensve Care Unit; ICCU: Intensive Cardiac Care Unit; NICU: Neonatal Intensive Care Unit; PICU: Pediatric Intensive Care Unit

As shown in Table 1, a total of 144 nurses participated in this study. The majority were female (91.0%), and most respondents were between 26 and 59 years of age (60.4%). The vast majority reported a monthly income at or below IDR 5,195,000 (82.6%). Most participants were unmarried (80.6%), and almost all nurses had completed a bachelor's degree in nursing (91.7%). More than half had worked in their current clinical role for 2–12 months (54.9%). In terms of type of intensive care units, the largest proportion of respondents worked in adult ICUs (52.8%), followed by NICUs (20.1%). For wound care training, only a small proportion of respondents had ever attended formal training (10.4%).

Table 2. Association Between Pressure Injury Prevention Adherence and Burnout Among ICU Nurses (N = 144)

Adherence Level	**Burnout High n (%)**	**Burnout Low n (%)**	**Total n (%)**
Adequate adherence	23 (27.4)	61 (72.6)	84 (100)
Inadequate adherence	43 (71.7)	17 (28.3)	60 (100)
Total	66 (45.8)	78 (54.2)	144 (100)
Statistical test	$\chi^2 = 27.65$	$p < 0.001$	Cramer's V = 0.438

The analysis demonstrated a significant association between pressure injury prevention adherence and burnout level among intensive care nurses. As presented in Table 2, nurses with adequate adherence showed a considerably lower proportion of high burnout (27.4%) compared with those who exhibited inadequate adherence (71.7%). Conversely, low burnout was more common among respondents with adequate adherence (72.6%) than those with inadequate adherence (28.3%). The chi-square test indicated a statistically significant relationship between the two variables (χ^2 (1) = 27.649, $p < 0.001$). The strength of this association was moderate, as reflected by a Cramer's V value of 0.438. These findings suggest that lower adherence to pressure injury prevention practices is associated with a higher level of burnout.

DISCUSSION

This study has revealed several key findings regarding the level of burnout and the practice of pressure injury prevention among nurses working in the intensive care setting. Generally, while the proportion of nurses with high burnout was lower than that of those with low burnout, its prevalence is still noteworthy. ICUs are known to be at elevated risk for burnout due to persistent exposure to critically ill patients, high cognitive demands, and emotional strain (Alzahrani et al., 2024; Juanamasta et al., 2024; Yestiana et al., 2019). Previous studies consistently show that ICU nurses across the world demonstrate some of the highest rates of burnout among hospital professions (Papazian et al., 2023; Ramírez-Elvira et al., 2021). This concern becomes even more relevant in the context of a Type A teaching hospital serving as a referral centre for the surrounding region, including the city of Depok, where the bed occupancy rate remains high and patient case complexity is high. Compared with non-teaching ICUs, nurses are also involved in clinical teaching activities, which add additional burden to their workload. These factors create an atmosphere of continuous workload pressure that may contribute to emotional exhaustion and depersonalization among nursing staff (Yestiana et al., 2019).

Regarding pressure injury prevention adherence, the current study revealed that adequate adherence remained more prevalent than inadequate adherence. Such a pattern is consistent with previous studies indicating that adherence to standard preventive practices—such as repositioning, skin inspection, and moisture management—tends to be relatively high among ICU nurses, largely due to institutional protocols and routine audits (Ghazanfari et al., 2022; Grešš Halász et al., 2021; Khojastehfar et al., 2020). Interestingly, adequate adherence remained dominant despite high burnout levels among nurses. Pressure injury prevention activities are embedded in daily nursing activities, and this condition may not be strongly affected by nurses' psychological conditions. These explanations may account for why adequate adherence remained dominant despite high burnout.

However, despite the dominance of adequate adherence in this study, the proportion of nurses showing inadequate adherence was not negligible. Even a moderate level of non-adherence can meaningfully impact patient safety, particularly in units where patients are highly vulnerable to skin breakdown due to immobility, hemodynamic instability, or use of invasive devices (Masyitha & Puspita, 2020; Mervis & Phillips, 2019; Stadnyk et al., 2018).

The relationship analysis showed that burnout was significantly associated with adherence levels. Nurses with high burnout were significantly more likely to demonstrate inadequate adherence to pressure injury prevention recommendations. This finding may imply that psychological fatigue, prolonged stress, and physical exhaustion may impair consistency in following pressure injury prevention protocols. Conceptually, this finding fits the JD-R model, which postulates that sustained job demands result in emotional exhaustion, diminished motivation, and decreased capability to carry out tasks that require consistency and vigilance (Montenegro Méndez et al., 2025). Burnout has been associated with increased clinical errors, lapses of judgment, and lower compliance with clinical guidelines (Kotb Basuony et al., 2023; Li et al., 2024; Sayrafi et al., 2024). Emotional exhaustion is considered the most critical dimension of burnout, as performing continuous protocols requires emotional stability. Therefore, this dimension may require greater attention from nursing management.

The effect size of the relationship, as evidenced by a Cramer's V value of 0.438, suggests a moderate association. This effect size suggests that burnout is not the sole factor contributing to nurses' adherence. It does play a clinically meaningful role. Other contextual variables such as staffing adequacy, teamwork, leadership support, and organizational culture may also influence adherence and should be explored in future research.

These findings have key implications for nursing practice. Given the crucial role of adherence to pressure injury prevention, structured interventions to mitigate burnout should be implemented in hospitals, particularly in high-intensity settings such as Type A teaching facilities. Such strategies could include workload redistribution, resilience building, regular psychological support, and supportive leadership at the unit level. Burnout surveillance integrated into routine nursing management may allow the identification of early risk patterns before they translate into compromised patient care. Nursing management should implement routine burnout screening at regular intervals to monitor burnout levels among ICU nurses.

However, it must be acknowledged that the present study has several limitations. The cross-sectional design does not establish a true cause-and-effect relationship, meaning that the directionality between burnout and adherence cannot be firmly established. Moreover, all measures were self-reported instruments, which may introduce response bias. Additionally, this study was conducted in a single large teaching hospital, which limits generalizability to other healthcare settings. Lastly, unmeasured organizational variables, such as staffing ratios or shift patterns, may also have influenced the outcomes.

CONCLUSION

This study demonstrates there is a significant association between burnout and adherence to pressure injury prevention guidelines among intensive care nurses working in a high-demand teaching hospital setting. Although adequate adherence to pressure injury prevention remained dominant, high burnout among nurses was considerably more likely to be associated with inadequate adherence. This finding may indicate that burnout may compromise patient safety. Ensuring adequate adherence requires organizational commitment to addressing burnout, optimizing working conditions, and reinforcing the importance of consistent pressure injury prevention practices. In particular, burnout management programs such as burnout screening, psychological support, and adequate staffing ratios are necessary. Future research is recommended to investigate additional factors that may contribute to nurses' adherence.

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Original Research

Effectiveness of Nursing Interventions in Managing Arteriovenous Fistula Insertion Pain in End-Stage Renal Failure Patients Undergoing Hemodialysis: Systematic Review

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ABSTRACT

End-stage renal failure (ESRD) is a global health issue requiring hemodialysis as a life-sustaining therapy. The insertion of an arteriovenous (AV) fistula, the primary vascular access for hemodialysis, often causes recurrent pain, impacting patient comfort and quality of life. Objective: To evaluate the pharmacological and non-pharmacological interventions for managing pain associated with AV fistula insertion in hemodialysis patients. Methods: A systematic review was performed by searching ScienceDirect, PubMed, EBSCO, and ProQuest databases. Articles were identified using Medical Subject Headings (MeSH) terms and relevant keywords related to hemodialysis, arteriovenous fistula, pain, and pain management interventions. Studies were screened following the PRISMA guidelines using Rayyan and critically appraised using the Joanna Briggs Institute (JBI) Critical Appraisal Tools. Results: The database search identified 381 records. After screening and eligibility assessment, 17 studies met the inclusion criteria. Both pharmacological and non-pharmacological interventions were associated with reduced pain during AV fistula insertion. Among the reviewed interventions, 2% lidocaine gel and cryotherapy at the Hegu point were the interventions most consistently associated with pain reduction. Conclusion: Both pharmacological and non-pharmacological interventions were associated with reduced pain during AV fistula insertion. Among the reviewed interventions, 2% lidocaine gel and cryotherapy at the Hegu point showed the most consistent associations with pain reduction. These findings may inform pain management practices in hemodialysis settings.

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INTRODUCTION

Chronic Kidney Disease (CKD) is a major global public health problem, affecting approximately one in ten people worldwide, with many individuals remaining unaware of their condition until it progresses to an advanced stage

(Francis et al., 2024; M. A. Ibrahim et al., 2022; World Health Organization, 2019). In 2021, CKD affected an estimated 843.6 million people globally, and its burden is expected to continue increasing, with mortality projected to rise by 41.5% by 2040 (World Health Organization, 2021). As CKD progresses to end-stage renal disease (ESRD), patients require kidney replacement therapies, such as dialysis or kidney transplantation, to sustain life. These treatments impose substantial economic and healthcare burdens, and the demand for such therapies continues to increase worldwide (Harris et al., 2019).

In Indonesia, the Indonesian Renal Registry (IRR) reported a growing number of patients undergoing hemodialysis, the most commonly used kidney replacement therapy for end-stage renal disease (ESRD) (United States Renal Data System, 2023). Hemodialysis requires reliable vascular access, with arteriovenous fistula (AV fistula) considered the gold standard due to its long-term effectiveness and lower complication rates. However, AV fistula cannulation involves repeated needle insertions, often up to 300 punctures annually, which can cause tissue trauma, pain, discomfort, and reduced quality of life (Jafari-koulaee et al., 2020; Saputra et al., 2020). A study involving 632 hemodialysis patients reported that 49% experienced moderate pain, 29% severe pain, and 22% mild pain during AV fistula cannulation (Ibrahim et al., 2022; Peralta et al., 2022).

Pain management is a fundamental component of nursing care for patients undergoing hemodialysis, particularly those who experience pain during arteriovenous (AV) fistula cannulation (Chocarro-Haro et al., 2025; Pinto et al., 2022). Nurses play a critical role in delivering holistic pain management through the implementation of both pharmacological and non-pharmacological interventions based on the principles of evidence-based practice (EBP). Effective pain management not only reduces patient discomfort but also enhances treatment adherence, patient satisfaction, and overall quality of care (Alzaatreh & Abdalrahim, 2020).

Various pharmacological and non-pharmacological interventions have been used to manage AV fistula cannulation pain, including topical anesthetics, cryotherapy, distraction techniques, aromatherapy, and acupressure. Previous studies have primarily evaluated individual interventions, such as topical anesthetics, cryotherapy, aromatherapy, or acupressure, in separate clinical settings. However, to our knowledge, no previous review has comprehensively synthesized both pharmacological and non-pharmacological nursing interventions for AV fistula cannulation pain (Alzaatreh & Abdalrahim, 2020). This lack of synthesized evidence limits evidence-based clinical decision-making and hinders the identification of the most effective pain management strategies for patients undergoing hemodialysis.

Given the high prevalence of AV fistula cannulation pain among patients with end-stage renal disease undergoing hemodialysis and the pivotal role of nurses in pain management, this study aimed to evaluate the effectiveness of pharmacological and non-pharmacological nursing interventions for reducing AV fistula cannulation pain. The findings of this study are expected to provide a robust evidence base for clinical practice, guide the selection of effective pain management strategies, and ultimately improve the quality of nursing care and patient outcomes.

METHOD

Study Design

This study employed a systematic review methodology following the PRISMA 2020 guidelines. The PICOT framework (Population, Intervention, Comparison, Outcome, Time) was used to define the eligibility criteria and guide the literature search strategy (Page et al., 2021). The review protocol was registered in the Open Science Framework (OSF) and is available at https://doi.org/10.31219/osf.io/4xfpz_v1.

Search Strategy

A systematic search was conducted across four electronic databases: ScienceDirect, PubMed, EBSCO, and ProQuest. The search was limited to articles published between 2019 and 2024 to ensure the inclusion of the most recent evidence on pain management interventions for arteriovenous fistula cannulation. Boolean operators (“AND”, “OR”) were used in combination with keywords related to arteriovenous fistula, pain management, pharmacological interventions, non-pharmacological interventions, hemodialysis, and renal dialysis. The search strategy used the following search string: ("arteriovenous fistula" OR "AV fistula") AND ("pain management" OR pain OR analgesia) AND ("hemodialysis" OR "renal dialysis") AND (pharmacological OR non-pharmacological).

Eligibility Criteria

Eligibility criteria were established according to the PICOT framework (Table 1). Studies were eligible for inclusion if they involved adult patients undergoing arteriovenous fistula (AVF) cannulation for hemodialysis and evaluated pharmacological and/or non-pharmacological interventions for pain management. Only original research articles published in peer-reviewed journals, available in full text, written in English, and published between 2019 and 2024 were included. Studies were excluded if they involved pediatric populations, addressed vascular access procedures other than AVF cannulation, did not evaluate pain management interventions or pain-related outcomes, or were duplicate publications, review articles, editorials, commentaries, conference abstracts, study protocols, or unavailable in full text.

Table 1. PICOT Framework

PICOT element	Description
Population (P)	Patients with end-stage renal disease (ESRD) undergo hemodialysis with an arteriovenous fistula (AVF)
Intervention (I)	pharmacological and non-pharmacological interventions for pain management during AVF cannulation.
Comparison (C)	Patients undergoing standard procedures without additional for pain management interventions.
Outcome (O)	Reduction in pain intensity and improvement in patient comfort during the AVF cannulation
Time (T)	Studies published between (2019-2024)

Note. AVF= Arteriovenous Fistula; ESRD= End-Stage Renal Disease.

Study Selection Process

The study selection process followed the PRISMA 2020 flow diagram (Figure 1). Articles identified through database searching were screened using the Rayyan web application based on predefined inclusion and exclusion criteria through title, abstract, and full-text review. The screening and data extraction processes were conducted by three researchers, comprising two independent reviewers and one researcher who acted as the final decision-maker in cases of disagreement. Any disagreements between reviewers were resolved through discussion and consultation with the third researcher until consensus was reached.

Quality Appraisal

The methodological quality of all potentially eligible studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Tools. A minimum quality score of 70% was established as the eligibility threshold for inclusion in the review. Following appraisal, 17 studies (85%) met the quality criteria and were retained for the final review, while 3 studies (15%) were excluded due to insufficient methodological quality. The selected studies subsequently proceeded to data extraction, thematic analysis, and narrative synthesis.

Data Extraction and Synthesis

Data were extracted using a standardized extraction form containing study characteristics, interventions, outcomes, and key findings. Findings were synthesized using a narrative synthesis approach, whereby studies were compared and grouped according to similarities and differences in pain management interventions and outcomes. Following JBI appraisal, 17 studies met the quality threshold and were included in the final review.

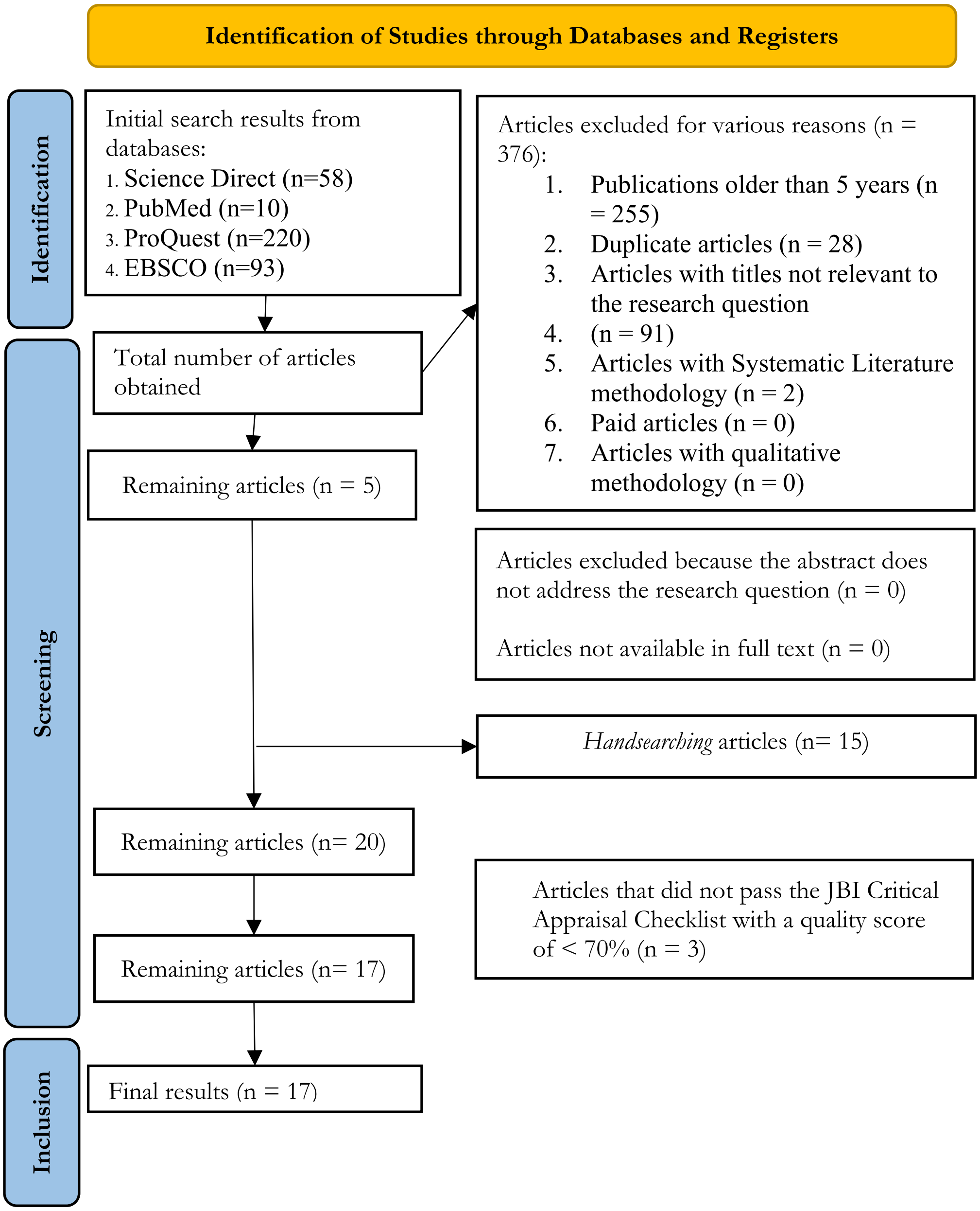

Figure 1. PRISMA flow diagram

RESULT

The characteristics and methodological quality of the included studies are presented in table 2. Study quality was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Tools, with most studies demonstrating good methodological quality.

Table 2. Study Characteristics and Quality

Author (Year)	Study Design	Sample (n)	Age (years)	Intervention	Pain Assessment Tool	Main Findings	JBI Score
Ibrahim et al. (2022)	Cross-sectional study	616 patients	20 to >80	2% Lidocaine gel applied 15–20 min before AVF cannulation	NRS	Pain score decreased from 5.04 to 2.61, indicating a reduction from moderate to mild pain	8/8 (100%)
Fujimoto et al. (2020)	RCT	32 patients	66.2 ± 10.7	EMLA cream (1 g; 25 mg lidocaine + 25 mg prilocaine) applied 1 h before cannulation	VAS	Pain score decreased from 29.8 mm to 10.9 mm; significantly lower than lidocaine tape (p=0.00001)	10/13 (76.92%)
Fujimoto et al. (2020)	RCT	34 patients	65.5 ± 10.6	Lidocaine tape (18 mg) applied 30 min before cannulation	VAS	Pain score decreased from 29.8 mm to 19.4 mm; less reduction than EMLA cream	10/13 (76.92%)
Maghbool et al. (2020)	RCT	34 patients	<50 to >60	4% topical eugenol nanoemulsion	VAS	Pain score decreased from 5.03 to 3.29; significantly lower than placebo (p<0.001)	13/13 (100%)
Lee et al. (2023)	RCT	38 patients	23–86	Vapocoolant spray (ethyl chloride) applied 3–4 s before cannulation	VAS	Arterial pain scores decreased from 4.45 to 2.98 and venous pain scores from 3.05 to 1.97 (p = 0.009).	13/13 (100%)
Marvi et al. (2023)	RCT	47 patients	18–20	Two sprays of 10% lidocaine (20 mg) applied 5 min before cannulation	VAS	Pain scores decreased from 3.79 to 2.62 and showed greater reduction than rhythmic breathing (p < 0.001).	10/13 (76.92%)
Gouda et al. (2023)	RCT	108 patients	43.7 ± 15.6	Two puffs of 10% lidocaine spray applied 10 min before cannulation	VAS	Pain scores changed from 4.7 to 4.3, with no significant difference compared with the control group (p = 0.054).	11/13 (84.6%)
Ebrahem (2019)	Quasi-experimental	45 patients	8–18	Cryotherapy (ice bag at Hegu point for 10 min before and during cannulation)	NPRS	Pain scores decreased from 7.16 to 2.36, indicating a reduction from severe to mild pain (p<0.0001).	8/9 (88.8%)
Abunab et al. (2021)	RCT	50 patients	31.1 ± 10.1	Cryotherapy alone (ice bag at Hegu point for 10 min)	NRS	Pain scores decreased from 5.34 to 3.92; less reduction than cryotherapy combined with distraction (p<0.05).	10/13 (76.9%)
Gouda et al. (2023)	RCT	108 patients	43.7 ± 15.6	Cold packs applied at fistula site 5 min before cannulation	VAS	Pain scores decreased from 4.7 to 4.0; no statistically significant reduction compared with control (p=0.051).	11/13 (84.6%)

Author (Year)	Study Design	Sample (n)	Age (years)	Intervention	Pain Assessment Tool	Main Findings	JBI Score
Back & Lee (2020)	RCT	77 patients	>50–60	Thermotherapy (10 or 20 min before cannulation)	VAS	Both thermotherapy durations significantly reduced pain scores compared with control ($p<0.001$).	12/13 (92.3%)
Tüzün Özdemir & Akyol (2023)	RCT	90 patients	18–25	Topical lavender massage	VAS	Pain scores decreased from 52.0 to 17.83, indicating a reduction from moderate to mild pain ($p<0.001$).	10/13 (76.9%)
Kılıç Akça et al. (2021)	RCT	75 patients	32–74	Aromatherapy massage (lavender and tea tree oils)	VAS	Pain scores decreased from 5.23 to 2.43, with effects maintained at 8-week follow-up ($p<0.001$).	10/13 (76.9%)
Kılıç Akça et al. (2021)	RCT	75 patients	32–74	Olive oil massage	VAS	Pain scores decreased from 5.60 to 2.61, but effects diminished at follow-up.	10/13 (76.9%)
Dewan et al. (2022)	Quasi-experimental	60 patients	41–60	Acupressure at Hegu (LI4) point before and during cannulation	NPRS	Pain scores decreased from 7.3 to 2.6, indicating a reduction from severe to mild pain ($p<0.05$).	9/9 (100%)
Razavi et al. (2022)	RCT	50 patients	56.2 ± 10.1	Foot reflexology for 20 min before cannulation	VAS	Pain scores decreased from 5.57 to 4.03 across three sessions ($p<0.05$).	11/13 (84.6%)
Ebrahem (2019)	Quasi-experimental	45 patients	8–18	Balloon inflation distraction	NPRS	Pain scores decreased from 7.16 to 2.72, indicating a reduction from severe to mild pain ($p<0.0001$).	8/9 (88.8%)
Aghbolagh et al. (2020)	RCT	120 patients	68–69	Visual distraction (nature images)	NRS	Pain scores decreased from 6.70 to 4.26 and showed greater reduction than auditory distraction ($p=0.001$).	11/13 (84.6%)
Aghbolagh et al. (2020)	RCT	120 patients	68–69	Auditory distraction (nature sounds)	NRS	Pain scores decreased from 6.70 to 5.48 but were less reduced than with visual distraction ($p=0.001$).	11/13 (84.6%)
Şen & Lafcı Bakar (2024)	RCT	60 patients	>50	Virtual reality glasses	VAS	Pain scores decreased from 3.89 before cannulation to 0.47 after the procedure ($p<0.05$).	11/13 (84.6%)
Gouda et al. (2023)	RCT	108 patients	43.7 ± 15.6	Flashlight distraction	VAS	No significant reduction in pain scores compared with control ($p=0.054$).	11/13 (84.6%)

Author (Year)	Study Design	Sample (n)	Age (years)	Intervention	Pain Assessment Tool	Main Findings	JBI Score
Malayjerdy & Malekzadeh (2019)	Quasi-experimental	30 patients	18–49	Mirror therapy	VAS	Pain scores decreased from 4.8 to 3.25, with the greatest reduction observed during the adaptive phase (p<0.001).	8/9 (88.8%)
Marvi et al. (2023)	RCT	47 patients	18–20	Rhythmic breathing	VAS	Pain scores decreased from 2.54 to 2.03; statistically significant but modest reduction (p=0.023).	11/13 (84.6%)
Abunab et al. (2021)	RCT	50 patients	29.9 ± 8.6	Cryotherapy combined with distraction	NRS	Pain scores decreased from 5.20 to 2.12 and patient satisfaction was higher than with cryotherapy alone (p<0.05).	10/13 (76.9%)
Tüzün Özdemir & Akyol (2023)	RCT	90 patients	18–65	Lavender inhalation	VAS	Pain scores decreased from 63.16 to 16.82, indicating a reduction from severe to mild pain (p<0.001).	10/13 (76.9%)
Şahin et al. (2021)	RCT	74 patients	50.7 ± 18.0	Lavender aromatherapy inhalation	NRS	Pain scores decreased from 6.24 to 3.56 and anxiety levels were also reduced.	12/13 (92.3%)

Note. AVF = Arteriovenous Fistula; EMLA = Eutectic Mixture of Local Anesthetics; JBI = Joanna Briggs Institute; LI4 = Large Intestine 4 (Hegu point); NRS = Numeric Rating Scale; NPRS = Numeric Pain Rating Scale; RCT = Randomized Controlled Trial; VAS = Visual Analog Scale.

The findings of the included studies were synthesized into two main categories: pharmacological and non-pharmacological interventions for pain management during arteriovenous fistula (AVF) cannulation in patients receiving hemodialysis. Based on the PRISMA synthesis (Figure 1), the findings were categorized into pharmacological and nonpharmacological intervention groups.

Pharmacological interventions

Pharmacological interventions were reported in six randomized controlled trials (RCTs) involving 641 hemodialysis patients across different age groups. Pain outcomes were primarily measured using the Visual Analogue Scale (VAS) in five studies and the Numeric Rating Scale (NRS) in one study. The interventions mainly consisted of local anesthetic approaches, including topical anesthetic creams and spray formulations. Across studies, topical anesthetic interventions consistently demonstrated greater reductions in post-procedural pain scores compared to baseline measurements, whereas spray-based interventions showed more variable effects, with some studies reporting minimal changes in VAS scores (Figure 2).

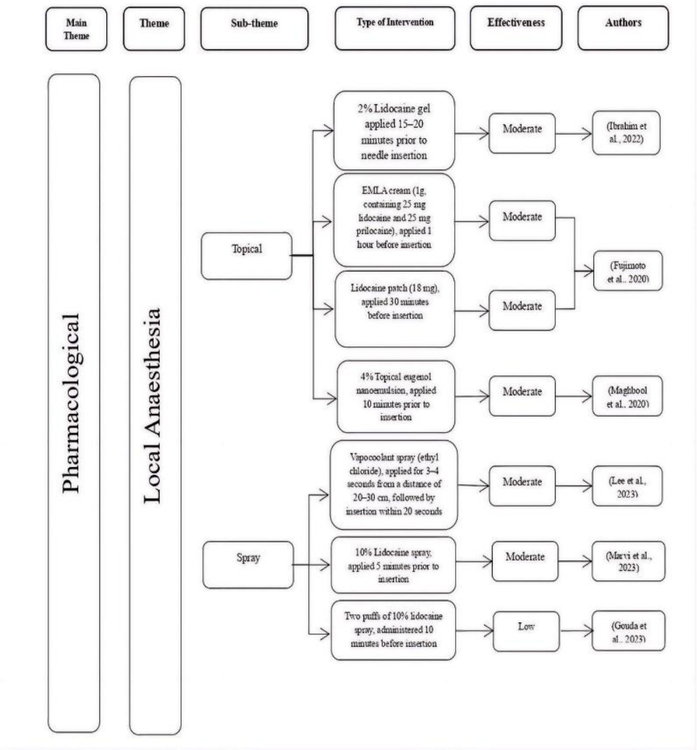

Figure 2. Mind map of pharmacological intervention themes and sub-themes

Non-pharmacological intervention

Non-pharmacological interventions were reported in 13 RCTs and 4 quasi - experimental studies involving 550 hemodialysis patients with AV fistula access. These interventions were grouped into five categories: psychological/cognitive techniques (e.g., distraction, breathing exercises, mirror therapy), physical therapies (e.g., cryotherapy, thermotherapy, massage), sensory/complementary approaches (e.g., acupressure), aromatherapy (inhalation), and combined interventions. Pain outcomes were assessed using VAS in 10 studies and NRS in 7 studies, with most studies reporting reduction in post-intervention pain scores compared to baseline. Among psychological and cognitive intervention, breathing techniques and distraction-based strategies demonstrated variable reduction in pain scores, while some studies reported minimal change, indicating heterogeneity in intervention effects. Physical therapies, particularly cryotherapy and massage, showed more consistent reductions in VAS/NRS score across studies. Combined intervention (e.g., cryotherapy with distraction) tended to produce greater reduction in pain scores compared to single-modality approaches in several studies. However, variation in study design, intervention protocols, and measurement timing limited direct comparison across studies (Figure 3).

Overall, the evidence suggests that both pharmacological and non-pharmacological interventions contribute to pain reduction during AV fistula cannulation, with topical anesthetics and multimodal non-pharmacological approaches showing more consistent reductions in reported pain scores. However, heterogeneity in study design and outcome measurement precluded quantitative synthesis or calculation of pooled effect size.

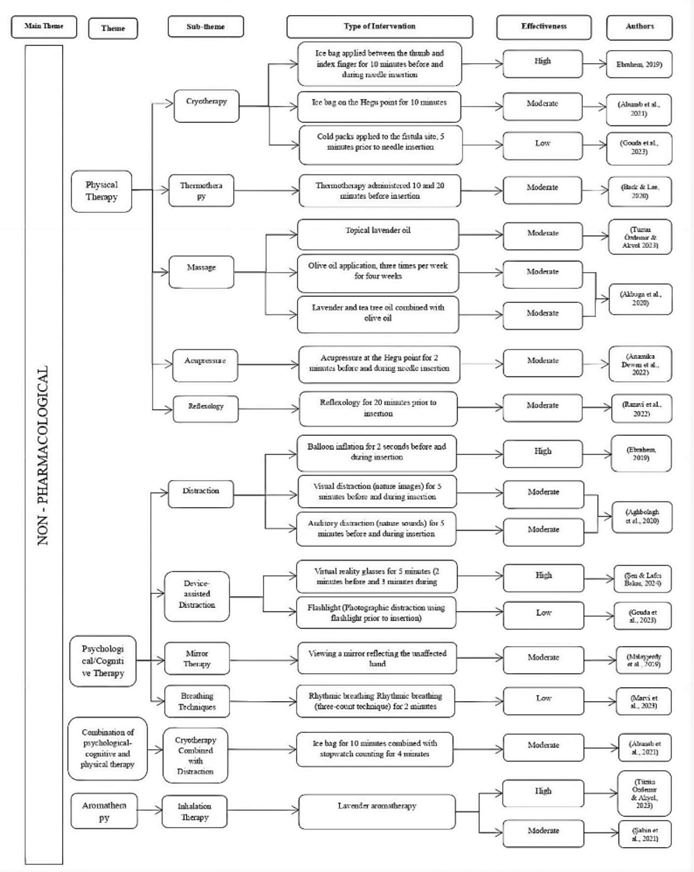

Figure 3. Mind map of non-pharmacological intervention themes and sub-themes

DISCUSSION

The findings of this review indicate that both pharmacological and non-pharmacological interventions may contribute to reducing AV fistula cannulation pain, although the strength of evidence varies across intervention types. Collectively, the included studies highlight several potentially beneficial interventions while also revealing substantial variability in effectiveness across different approaches.

Evidence on AV Fistula Pain Management Interventions

Pain assessment in patients undergoing AV fistula cannulation plays a crucial role in evaluating the effectiveness of pain management and the quality of care provided, whether through pharmacological or non-pharmacological interventions. Unmanaged pain can significantly impact patient comfort and adherence to hemodialysis therapy (Bjelkarøy et al., 2024; Rao et al., 2022). Given that AV fistula cannulation is performed repeatedly throughout long-term hemodialysis treatment, effective pain management represents an important component of patient-centered care. Appropriate pain control may improve patients' treatment experiences, reduce

procedural distress, and support continued engagement with hemodialysis therapy (Alzaatreh & Abdalrahim, 2020; Pinto et al., 2022). Across the reviewed studies, both pharmacological and non-pharmacological interventions were generally associated with reductions in AV fistula cannulation pain. However, the magnitude of pain reduction varied across studies, reflecting differences in study populations, intervention protocols, and outcome assessment methods. Most studies used standardized pain assessment tools, which improved consistency in outcome evaluation across studies.
In studies involving a control group, patients who did not receive specific interventions tended to experience persistent moderate to severe pain without significant change. In contrast, intervention groups generally reported reductions in pain scores. However, although most studies reported positive findings, many involved relatively small sample sizes and short-term outcome assessments, limiting the overall strength of the evidence (Rao et al., 2022).

Several non-pharmacological interventions were associated with substantial reductions in pain scores. However, direct comparisons with pharmacological interventions remain difficult because of differences in study design, intervention protocols, patient characteristics, and outcome assessment methods. Consequently, while both approaches appear beneficial, the current evidence is insufficient to determine the superiority of any specific intervention. In practice, non-pharmacological interventions were frequently used as complementary or supplementary options, while in many cases of chronic pain, pharmacological therapy alone did not result in clinically significant pain reduction (Wang et al., 2025). Therefore, non-pharmacological interventions may be considered complementary or alternative approaches, depending on patient preferences, clinical conditions, and available resources. Interpretation of these findings should be undertaken cautiously because considerable heterogeneity was observed across studies in terms of intervention duration, timing of pain assessment, sample characteristics, intervention protocols, and outcome measurement tools, limiting direct comparisons of intervention effectiveness. Therefore, while the overall findings suggest that both pharmacological and non-pharmacological interventions may reduce AV fistula cannulation pain, the current evidence base is limited by methodological heterogeneity and the predominance of small single-center studies. Future adequately powered randomized controlled trials using standardized pain assessment methods are needed to determine the relative effectiveness and clinical significance of these interventions (Alzaatreh & Abdalrahim, 2020; Chocarro-Haro et al., 2025).

Pharmacological Interventions

Across pharmacological studies, topical anesthetic agents were consistently associated with reductions in AV fistula cannulation pain. Lidocaine-based preparations, including 2% lidocaine gel, lidocaine tape, and EMLA cream, generally demonstrated beneficial effects on pain reduction, while topical eugenol nanoemulsion also showed promising results (Arab et al., 2017; Fujimoto et al., 2020; Maghbool et al., 2020). However, the available evidence remains limited because each intervention was evaluated in only a small number of studies, often with relatively small sample sizes. In addition, variations in study design, sample characteristics, and outcome assessment methods make direct comparisons between pharmacological interventions challenging. The favorable outcomes observed with lidocaine-based agents and eugenol nanoemulsion suggest that these topical analgesics may be useful options for reducing AV fistula cannulation pain in clinical practice. Nevertheless, further high-quality comparative studies are required to determine their relative effectiveness and support stronger clinical recommendations (Maghbool et al., 2020).

Non-Pharmacological Interventions

The reviewed studies identified a broad range of non-pharmacological interventions for AV fistula cannulation pain, including cryotherapy, acupressure, aromatherapy, distraction techniques, device-assisted therapies, and multimodal approaches. Among these interventions, cryotherapy, acupressure, lavender aromatherapy, and distraction-based approaches demonstrated the most consistent reductions in pain scores across the included studies. Evidence supporting cryotherapy is particularly notable, as findings from a systematic review and meta-analysis indicated a significant overall benefit in reducing AV fistula cannulation-related pain (Jafari-koulaee et al., 2020). Similarly, randomized trials reported favorable effects of distraction-based interventions and acupressure on pain reduction during needle insertion (Abunab et al., 2021).

Despite these promising findings, the overall strength of evidence remains limited. Most interventions were evaluated in single-center studies with relatively small sample sizes, restricting confidence in the reproducibility and generalizability of the results. Furthermore, substantial heterogeneity in study designs, intervention protocols, and pain assessment methods complicates direct comparisons between approaches and limits the ability to identify a clearly superior intervention. While cryotherapy, acupressure, lavender aromatherapy, and distraction techniques may represent feasible, low-cost strategies for routine hemodialysis practice, further well-designed comparative trials are needed to establish their relative effectiveness and determine their clinical significance (Dewan et al., 2022; Ebrahem et al., 2019).

CONCLUSIONS

A review of 17 studies indicates that both pharmacological and non-pharmacological interventions may help reduce pain associated with arteriovenous fistula (AV fistula) cannulation in hemodialysis patients. As summarized in the evidence synthesis matrix, 2% lidocaine gel was the most consistently studied pharmacological intervention, while cryotherapy using ice packs demonstrated the most favorable and consistent findings among non-pharmacological approaches. However, substantial heterogeneity in study design, sample characteristics, intervention protocols, pain assessment tools, and outcome measures limits direct comparisons between interventions. Therefore, pain management strategies should be individualized according to patient preferences, clinical conditions, and available resources. These findings support the integration of evidence-based pain assessment and management approaches into nursing protocols and hemodialysis care. Further high-quality comparative studies and meta-analyses are needed to clarify the relative effectiveness of available interventions.

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Original Research

The Role of Cognitive Behavioral Therapy in Improving Quality of Life Among Patients with Psoriasis: A Literature Review

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ABSTRACT

Introduction: Psoriasis is a chronic inflammatory skin disease often accompanied by significant psychosocial impacts. Patients frequently report body image disturbances, embarrassment, social stigma, and reduced social participation, which ultimately contribute to a diminished quality of life. This literature review aims to synthesize evidence on the effectiveness of Cognitive Behavioral Therapy in improving the quality of life of patients with psoriasis from a psychological perspective. Methods: This literature review was conducted by identifying the PICO framework (Population/Patient, Intervention, Comparison, Outcome). A literature search was conducted from 2025 to 2026 following the PRISMA 2020 guidelines and the Joanna Briggs Institute (JBI) methodology across several scientific databases, including Wiley Online Library, ScienceDirect, and Google Scholar. Inclusion criteria comprised articles published within the last six years, focusing on CBT interventions and quality of life in patients with psoriasis, and available in full text. Results: The literature review identified two main themes. The first theme highlights the role of CBT in reducing psychological distress, including anxiety, depression, emotional stress, and negative body image, as a primary pathway to improving quality of life. The second theme emphasizes the modification of maladaptive behaviors into adaptive coping strategies, resulting in improved social functioning, daily activities, and interpersonal relationships. Recommendations: Cognitive Behavioral Therapy should be considered as an adjunct intervention in the comprehensive management of psoriasis to improve patients' psychological well-being and quality of life. Further research with larger sample sizes and long-term follow-up is recommended to strengthen evidence regarding its sustained effectiveness across diverse patient populations

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INTRODUCTION

Psoriasis is a chronic inflammatory skin disease often accompanied by significant psychosocial impacts. Patients frequently report body image disturbances, embarrassment, social stigma, and reduced social participation, ultimately contributing to a diminished quality of life (Homayoon et al., 2020; Jankowiak et al., 2020; Krstanović et al., 2024). The psychological burden in patients with psoriasis is often comparable to that of other chronic diseases and correlates with lesion severity and visible body location (Krstanović et al., 2024). These effects tend to be more pronounced due to social pressures related to aesthetic standards and gender roles that intensify concerns about appearance, making interventions targeting cognitive-emotional processes particularly relevant (Esmalian Khamseh et al., 2020). Preliminary evidence highlights the need for psychological interventions as an integral component of psoriasis management to achieve more holistic outcomes (Esmalian Khamseh et al., 2020; Krstanović et al., 2024).

Quality of life is defined as an individual's perception of their position in life within the context of their culture and value systems, and in relation to their goals, expectations, standards, and concerns (WHO, 2024). In psoriasis, reduced quality of life is commonly associated with impairments in physical, psychological, social, and daily functioning (Ghezzi et al., 2024; Walniczek et al., 2025). Several studies have shown that patients with psoriasis experience significant disruptions in emotional, social, and interpersonal domains due to stigma, shame, negative body image, and chronic stress associated with the disease (Krstanović et al., 2024; Jankowiak et al., 2020). These psychosocial impacts are further complicated by negative body image perceptions, which exacerbate psychological distress, reduce self-confidence, and limit social participation (AleKasir & Abbasian Haddadan, 2025; Nazik et al., 2017). Psychological factors such as stress, anxiety, and depression are also known to exacerbate disease progression through activation of systemic inflammatory responses, including increased inflammatory biomarkers such as C-reactive protein (CRP) and proinflammatory cytokines (Lei et al., 2025; Wang et al., 2025). Cognitive Behavioral Therapy (CBT) has been suggested as a potential intervention to reduce psychological stress and improve emotional regulation, which may contribute to the modulation of systemic inflammatory responses, including CRP levels (Lopresti, 2017).

One psychological intervention shown to be effective in improving the quality of life of patients with psoriasis is Cognitive Behavioral Therapy (CBT). CBT focuses on restructuring negative thought patterns and modifying maladaptive behaviors into more adaptive coping strategies, thereby reducing emotional distress and enhancing self-confidence (Revankar., et al., 2022). Evidence indicates that CBT can reduce anxiety and stress while improving self-image in female patients with psoriasis (Esmalian Khamseh et al., 2020). Furthermore, CBT helps patients understand the interaction between emotional states and skin symptoms, enabling more adaptive stress management. This approach supports psychological adjustment and contributes to improved overall quality of life.

Several studies have demonstrated that CBT is effective in improving emotional and social well-being in patients with chronic skin conditions. Safaei and Atashpor (2021) found that seven sessions of group CBT significantly improved quality of life scores compared to a control group. Khamseh et al. (2020) demonstrated that eight sessions of individual CBT reduced body image anxiety and improved self-esteem in women with psoriasis. Revankar et al. (2022) confirmed that CBT has a positive effect on reducing stress, depression, and anxiety in various dermatological disorders, including psoriasis. These findings support CBT as an adjunct psychological intervention that complements medical therapy. CBT-based approaches not only improve emotional well-being but also enhance social adaptability.

CBT also assists patients in identifying and managing negative automatic thoughts associated with stigma and self-dissatisfaction (Krstanović et al., 2024). By fostering more adaptive cognitive patterns, patients become more capable of accepting their condition and engaging in healthier social interactions. Moreover, variants of CBT, such as Mindfulness-Based Cognitive Therapy (MBCT), have been shown to enhance social support and psychological capital in individuals with psoriasis (AleKasir & Haddadan, 2025). Overall, CBT represents a relevant and comprehensive intervention strategy for improving the quality of life of individuals living with psoriasis.

Previous studies have primarily focused on the effectiveness of Cognitive Behavioral Therapy in reducing psychological distress and inflammatory responses in patients with mental or chronic physical illnesses. However, limited reviews have specifically examined the role of CBT and its variants in improving quality of life among patients with psoriasis. Therefore, this literature review aims to critically synthesize evidence on the effectiveness of Cognitive Behavioral Therapy in improving the quality of life of patients with psoriasis from a psychological perspective.

METHOD

This literature review used by identifying PICO (Population/Patient, Intervention, Comparison, Outcome). For Population: Patients with psoriasis, Intervention: Cognitive Behavioral Therapy (CBT) and its variants (ICBT, MBCT), Comparison: no other intervention, and Outcome: Improved quality of life and psychological well-being (reduced stress, depression, anxiety). The sources of the literature review used are from Wiley Online, ScienceDirect, and Google Scholar. The keywords used were "Cognitive Behavioral Therapy" AND "Psoriasis" AND "Quality of Life" AND “(People with Psoriasis)”

Table 1. Framework Research Question PICO

P	I	C	O
People with Psoriasis	*Cognitive Behavioral Therapy* (CBT) & variannya (ICBT, MBCT)	other psychological interventions or standard care	Improved quality of life

This literature review focused on the application of Cognitive Behavioral Therapy (CBT) in improving the quality of life of people with psoriasis. The literature search was conducted for studies published between 2025 and 2026 across Wiley Online Library, ScienceDirect, and Google Scholar.

A total of seven relevant articles were selected based on predefined inclusion and exclusion criteria. The inclusion criteria comprised articles published within the last six years, focusing on CBT interventions in patients with psoriasis, and available in full text. The exclusion criteria included studies that did not use CBT as the primary intervention or did not involve patients with psoriasis.

All retrieved articles were screened using Mendeley Desktop to identify and remove duplicates prior to analysis. Methodological quality and risk of bias were assessed using the Joanna Briggs Institute (JBI) critical appraisal tools appropriate for each study design.

RESULT

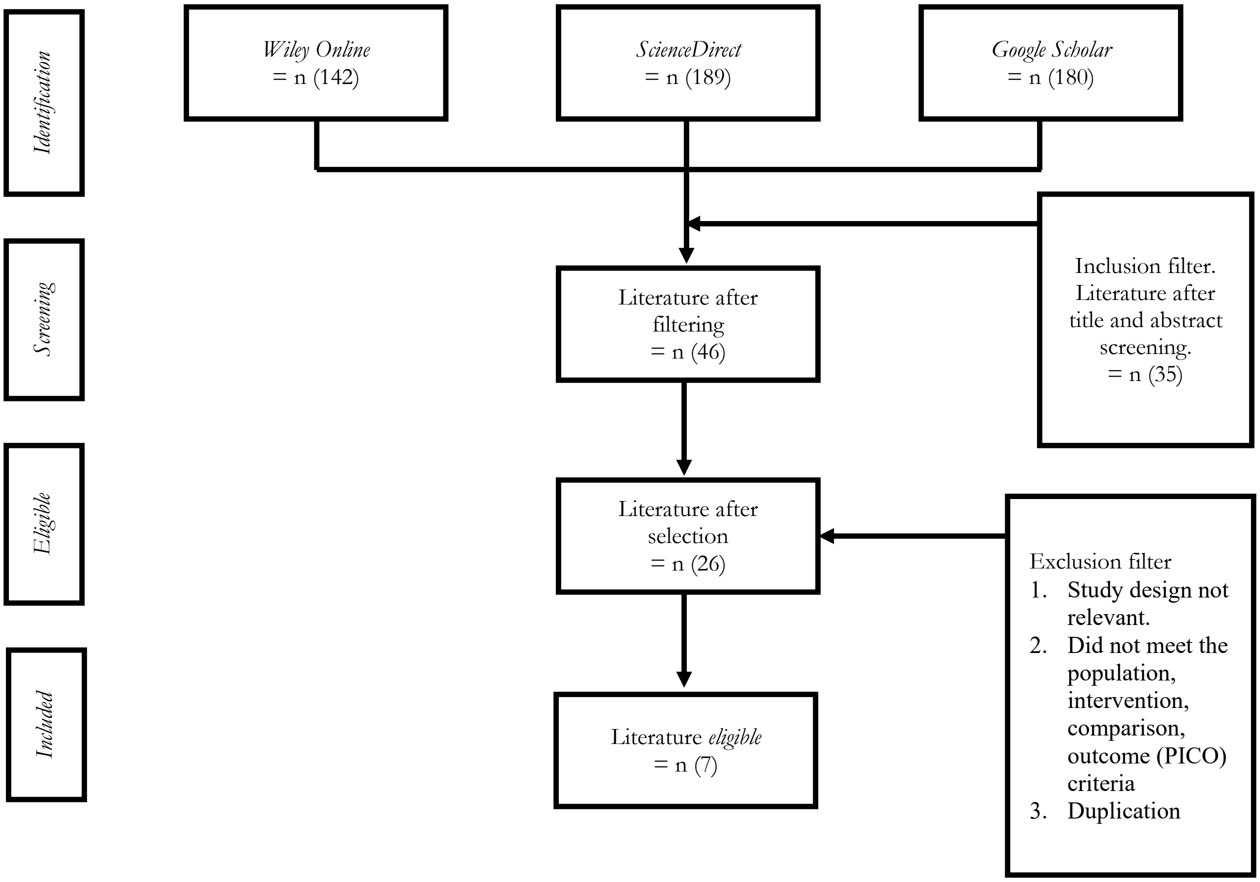

Figure 1PRISMA Flow Diagram

Table 2. Results of literature characteristics

No	Title	Author, Year, Country	Design / Intervention	Population (n)	Main Outcome
1	*The Effectiveness of Group Cognitive-Behavioral Therapy on Quality of Life in Patients with Psoriasis Skin Disease*	Safaei & Atashpor, 2021, Iran	Semi-experimental study with a pre-test post-test with a test and control group	30 patients with psoriasis	The intervention group demonstrated statistically significantly higher scores compared to the control group, thus indicating the effectiveness of the intervention.
2	The effectiveness of cognitive behavioral therapy based on Cash's eight-step model in body image of women with psoriasis	Esmalian Khamseh et al., 2020, Iran	The research was semi-experimental with pre-test and post-test design in both experimental and control groups.	60 patients with psoriasis	Body image anxiety and its two subscales were significantly reduced among women with psoriasis following cognitive behavioral therapy guidance, with effects sustained at the three-month follow-up.
3	*The Comparing Effectiveness of Cognitive-Behavioral Therapy and Compassion-Focused Therapy on Quality of Life in Women with Psoriasis*	Shaban et al., 2025 Iran	Then the first experimental group underwent 8 sessions of 90 minute .	45 women patients with psoriasis	Quality of life in women with psoriasis can be improved through the use of cognitive-behavioral therapy and compassion-focused therapy
4	*Effects of Mindfulness Cognitive Therapy versus Cognitive Behavioral Therapy on Negative Emotions and Quality of Life in Psoriasis Patients*	Shi et al., 2022 China	They were randomly divided into a control group (65 cases, cognitive behavioral therapy) and an experimental group (65 cases, positive cognitive therapy).	130 patients with psoriasis	The cognitive behavioral therapy applied in the control group primarily involved regular communication with patients to assess their psychological condition and concerns in a timely manner, followed by the provision of tailored psychological support, as well as guidance on diet and lifestyle.
5	Online Mindfulness-Based Cognitive Therapy as a Treatment for Patients with Psoriasis: A Randomized Controlled Trial	Zhao et al., 2025 China	This single-site randomized clinical trial included 109 participants with psoriasis who were randomly allocated to receive either treatment as usual	109 participants with psoriasis	This study indicates that online mindfulness-based cognitive therapy (MBCT) can significantly improve lesion severity, depression, quality of life, and pruritus in patients with psoriasis who are already receiving medication. Furthermore, this form of online psychotherapy may serve as a viable option for the comprehensive management of psoriasis..
6	Comparison of the Effectiveness of Emotion-Focused Cognitive-Behavioral Therapy (ECBT) and Mindfulness-based Cognitive Therapy (MBCT) on C-Reactive Protein (CRP) Level in Patients with Psoriasis	Mehdizadeh et al., 2019 Iran	This research is a quasi-experimental study with a pretest-posttest design, a follow-up period, and control and intervention groups. The	30 patients with psoriasis	Both enhanced cognitive behavioral therapy (ECBT) and mindfulness-based cognitive therapy (MBCT) are effective interventions for addressing the physical, psychological, and biological complications associated with psoriasis.
7	A Trial of Coach-Supported, Smartphone-Delivered Cognitive s Therapy for Psoriasis With Comorbid Depression	Barbieri et al., 2025 USA	An experimental group	30 patients with psoriasis	This study demonstrates that smartphone-based Cognitive Behavioral Therapy (CBT) is a feasible and acceptable intervention with potential effectiveness for individuals with psoriasis experiencing depressive symptoms.f

Table 3. Critical Appraisal of Included Studies Using the JBI Critical Appraisal Checklist (9 Items)

No	Artikel	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
1	Safaei & Atashpor, 2021, Iran	Y	Y	Y	Y	Y	Y	Y	Y	Y
2	Esmalian Khamseh et al., 2020, Iran	Y	Y	Y	Y	Y	Y	Y	Y	Y
3	Shaban et al., 2025 Iran	Y	Y	Y	Y	Y	Y	Y	Y	Y
4	Shi et al., 2022 China	Y	Y	Y	Y	Y	Y	Y	Y	Y
5	Zhao et al., 2025 China	Y	Y	Y	Y	Y	Y	Y	Y	Y
6	Mehdizadeh et al., 2019 Iran	Y	Y	Y	Y	Y	Y	Y	Y	Y
7	Barbieri et al., 2025 USA	Y	Y	Y	Y	Y	Y	Y	Y	Y

Questions:

1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?
2. Were the participants included in any comparisons similar?
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?
4. Was there a control group?
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?
7. Were the outcomes of participants included in any comparisons measured in the same way?
8. Were outcomes measured in a reliable way?
9. Was appropriate statistical used?

DISCUSSION

Theme 1. The Role of Cognitive Behavioral Therapy in Reducing Psychological Distress as a Primary Pathway to Improve Quality of Life in Psoriasis

Psoriasis is a chronic inflammatory skin disease that causes not only physical symptoms but also significant psychological burden, particularly anxiety, depression, and persistent emotional stress. Recent studies indicate that psychological distress significantly contributes to reduced quality of life, often exceeding the impact of skin lesion severity itself (Cipolla et al., 2024; Krstanović et al., 2024). This reinforces the psychodermatological view that psoriasis should be understood as a biopsychosocial disorder. Psychological interventions such as Cognitive Behavioral Therapy (CBT) are relevant because they target cognitive and emotional factors that exacerbate patients' subjective experiences. This approach complements dermatological therapies, which generally focus on the physical aspects of the disease. Recent evidence also suggests that psychological interventions, including CBT and digital CBT-based approaches, are effective in reducing anxiety and improving quality of life in psoriasis patients (Barbieri et al., 2025; Wei et al., 2024). Shi et al., (2022) showed that CBT is carried out through directed communication with patients to understand psychological conditions, provide emotional guidance, and appropriate lifestyle guidance, thereby helping to reduce negative emotions and improve overall quality of life.

Emotion regulation is a key mechanism linking CBT and improved quality of life. CBT and related cognitive approaches have been shown to reduce negative emotional states such as anger, shame, anxiety, and hopelessness, which are commonly experienced by patients with psoriasis (Shi et al., 2022). Improved emotion regulation enables patients to respond to disease flares with reduced emotional reactivity and greater psychological control. This aligns with psychodermatological perspectives, which emphasize that negative emotional states can intensify symptom perception and further impair quality of life (Krstanović et al., 2024). Recent research by Samela et al. (2025) showed that psoriasis patients have higher levels of emotional dysregulation, which is associated with increased psychological distress and reduced quality of life. CBT-based interventions have been shown to help patients identify, evaluate, and modify maladaptive emotional responses, thereby achieving emotional stability. Thus, CBT contributes to quality of life by improving emotion regulation, enhancing coping skills, and strengthening patients' psychological stability.

Cognitive Behavioral Therapy works by identifying and modifying cognitive distortions that develop as a result of living with psoriasis, including negative beliefs about one's appearance, fear of social judgment, and feelings of helplessness that contribute to avoidance behavior and reduced quality of life (Esmalian Khamseh et al., 2020; Krstanović et al., 2024; Revankar, et al., 2022). A study by Esmalian Khamseh et al., (2020) showed that CBT significantly improved the quality of life of patients with psoriasis by reducing anxiety and depression, as measured by standard psychological instruments. These findings align with research by Safaei and Atashpour (2021), who reported reduced stress and improved psychological well-being after a CBT intervention. With reduced emotional distress, patients become better able to manage their responses to chronic disease. This confirms that cognitive change is a key mechanism in improving quality of life.

The effectiveness of Cognitive Behavioral Therapy (CBT) in improving quality of life has also been demonstrated across various delivery modes. An online Mindfulness-Based Cognitive Therapy (MBCT) intervention significantly improved quality of life and reduced depression and itching in patients with psoriasis undergoing medical treatment (Zhao et al., 2026). These findings indicate that digitally delivered interventions can provide accessible psychological support without geographical barriers. Recent studies also show that smartphone-based CBT is effective in reducing symptoms of depression and anxiety, as well as improving quality of life and emotional functioning in patients with psoriasis (Barbieri et al., 2025). These findings align with Rissi et al. (2025), who confirmed that CBT and mindfulness-based psychological interventions have positive effects on the psychological well-being and quality of life of patients with psoriasis. Meta-analytic evidence further supports that psychosocial interventions such as CBT, mindfulness, and MBCT significantly reduce emotional stress, anxiety, and depression while improving quality of life in psoriasis patients (Eckardt et al., 2024; Lu et al., 2025; Wei et al., 2024).

The impact of Cognitive Behavioral Therapy (CBT) on quality of life in patients with psoriasis is explained through several interrelated psychological mechanisms. AleKasir and Abbasian Haddadan (2025) reported that cognitive-behavioral interventions increase psychological capital and reduce learned helplessness, both of which are closely associated with quality of life. Increased psychological capital, including hope, optimism, self-efficacy, and resilience, enables patients to adopt a more adaptive outlook toward chronic illness. These findings align with recent evidence showing that psychological distress, feelings of helplessness, and negative disease perceptions are strong predictors of reduced quality of life in patients with psoriasis (Wang et al., 2025; Samela et al., 2025). Furthermore, Shi et al. (2022) demonstrated that CBT, through targeted communication, psychological counseling, and lifestyle guidance, effectively reduces negative emotions and improves quality of life. Synthetically, the evidence indicates that CBT improves quality of life primarily by reducing psychological distress, alleviating anxiety and depression, enhancing emotion regulation, and strengthening coping skills and psychological resilience (Barbieri et al., 2025; Krstanović et al., 2024).

This effect has been consistently observed across various study designs and populations, supporting the robustness and generalizability of the findings across contexts (Esmalian Khamseh et al., 2020; Li et al., 2022; Krstanović et al., 2024). Recent meta-analyses further support that psychological interventions, including CBT and mindfulness-based approaches, significantly improve quality of life, reduce emotional distress, and strengthen coping skills in patients with psoriasis (Wei et al., 2024; Lu et al., 2025). This finding is further reinforced by Zhao et al. (2026), who demonstrated that online Mindfulness-Based Cognitive Therapy significantly improved quality of life, reduced depression, decreased itching, and improved lesion severity in patients with psoriasis receiving medical treatment. By addressing the often-overlooked psychological dimensions of psoriasis management, CBT provides a more holistic, biopsychosocial-oriented approach to care.

Theme 2. Modifying Maladaptive Behavior through Cognitive Behavioral Therapy as an Effort to Improve Social Function and Daily Activities

Patients with psoriasis often develop maladaptive behaviors such as social avoidance, activity restriction, and withdrawal in response to the disease. These behaviors are primarily driven by shame, fear of stigma, and negative body image, which significantly reduce quality of life in social and functional domains (Krstanović et al., 2024; Revankar et al., 2022). These findings are further supported by Ponikowska et al. (2025), who identified social stigma, body image disturbance, and fear of negative evaluation as key determinants of impaired interpersonal relationships and social functioning in patients with psoriasis. CBT is designed to address the interaction between cognition, emotion, and behavior. Through cognitive restructuring and behavioral modification, CBT reduces social avoidance tendencies and promotes more adaptive behavioral responses

Revankar et al. (2022) demonstrated that Cognitive Behavioral Therapy (CBT) improves body image and reduces avoidance behavior in patients with psoriasis. These changes are associated with increased social engagement and greater confidence in daily activities. Similarly, Muftin et al. (2022) reported reduced social embarrassment following a cognitive-behavioral intervention. Body image disturbance is strongly associated with reduced quality of life, depression, anxiety, and impaired social relationships in patients with chronic skin diseases, including psoriasis (Fidelis et al., 2025; Ponikowska et al., 2025). Furthermore, recent studies indicate that CBT is effective in helping patients accept changes in skin appearance, reduce embarrassment, and decrease social avoidance behavior (Almeida et al., 2025). Overall, by reducing avoidance behavior and improving body image, CBT enhances patients' ability to maintain optimal social functioning. These findings highlight behavioral change and body image improvement as key components in enhancing quality of life.

CBT strengthens adaptive coping strategies, including problem-solving, behavioral activation, and restructuring maladaptive responses to stress. These skills enable patients to manage stressful situations more effectively without reverting to avoidance-based coping patterns. Safaei and Atashpor (2021) confirmed that higher adaptive coping is associated with improved psychosocial functioning and quality of life in patients with psoriasis. Consistent with this, recent studies indicate that CBT- and mindfulness-based interventions significantly enhance coping skills, resilience, and daily functioning in this population (Almeida et al., 2025; Lu et al., 2025). Barbieri et al. (2025) further reported that smartphone-based CBT facilitates the development of adaptive coping strategies in response to chronic stress related to disease flares and social stigma. Additional evidence suggests that CBT also improves self-perception and strengthens internal psychological resources, thereby reinforcing more adaptive coping patterns (Shaban et al., 2025a). Collectively, these findings indicate that quality of life is influenced not only by emotional states but also by patients' capacity to manage daily activities effectively and maintain social functioning.

Social support is an important component of CBT-mediated behavioral change. AleKasir and Abbasian Haddadan (2025) demonstrated that CBT-based interventions increase perceived social support, which plays a crucial role in adaptation to chronic illness. Enhanced social support enables patients to maintain social roles and routine activities. These findings are supported by Ponikowska et al. (2025), who identified social stigma, interpersonal isolation, and limited social relationships as key determinants of reduced quality of life in patients with psoriasis. Walniczek et al. (2025) further showed that anxiety and depression significantly affect the social domain of quality of life, highlighting social support as a protective factor. In addition, Lu et al. (2025) confirmed that CBT contributes to improved social functioning, reduced withdrawal, and stronger interpersonal relationships, reinforcing the central role of social functioning in quality of life in psoriasis (Krstanović et al., 2024).

between psychological and biological factors. Reductions in these inflammatory markers may indirectly improve patients' comfort in daily activities and social interactions due to better-controlled physical symptoms. This is further supported by Dymek et al. (2025), who emphasized that psychological support within a multidisciplinary approach contributes to improved clinical outcomes, psychological well-being, sleep quality, and long-term self-management in psoriasis. CBT may contribute to reduced CRP levels by decreasing psychological stress and enhancing emotional regulation, which are associated with reduced systemic inflammatory responses (Lopresti, 2017).

Although all seven included studies generally reported positive outcomes of Cognitive Behavioral Therapy (CBT) and its variants in improving quality of life among patients with psoriasis, the strength of evidence varied across studies. Several studies employed quasi-experimental or semi-experimental designs with relatively small sample sizes, such as Safaei & Atashpor (2021) and Mehdizadeh et al. (2019), which may limit the generalizability of the findings. Stronger evidence was provided by randomized controlled trials, including Zhao et al. (2026) and Shi et al. (2022), which involved larger sample sizes and more structured intervention protocols. In addition, digital and smartphone-based CBT interventions, such as those reported by Barbieri et al. (2025), demonstrated good feasibility and acceptability. Variations in intervention types (e.g., CBT, MBCT, ECBT) and differences in outcome measures may also explain inconsistencies in effect sizes across studies. Overall, while CBT-based interventions appear promising for improving psychological well-being and quality of life in psoriasis patients, further large-scale randomized controlled trials with long-term follow-up are needed to strengthen the evidence base.

and social engagement. These changes include increased participation in social activities, improved daily functioning, enhanced interpersonal relationships, and better maintenance of social roles previously disrupted by the disease (Revankar et al., 2022; Muftin et al., 2022). Consistent with this, recent evidence shows that CBT- and mindfulness-based psychosocial interventions improve social functioning, adaptive behavior, and quality of life in patients with psoriasis across clinical contexts (Lu et al., 2025; Ponikowska et al., 2025). Walniczek et al. (2025) confirmed that improvements in psychosocial functioning and interpersonal relationships are strongly associated with enhanced quality of life. Shaban et al. (2025) further demonstrated that CBT reduces body image concerns, indirectly contributing to improved social functioning and psychological well-being.

Mehdizadeh et al. (2019) found that both Emotion-Focused Cognitive-Behavioral Therapy (ECBT) and Mindfulness-Based Cognitive Therapy (MBCT) were associated with reductions in C-reactive protein (CRP) levels. This finding is supported by Lei et al. (2025), who showed that psychological stress plays a significant role in activating inflammatory pathways in psoriasis, including increased CRP and pro-inflammatory cytokines. Mitsiou et al. (2024) reported that elevated CRP levels are associated with depression in patients with psoriasis, indicating a close interaction

Several methodological limitations should also be acknowledged. Most studies used quasi-experimental or semi-experimental designs with relatively small sample sizes, limiting generalizability. Substantial heterogeneity was observed across intervention modalities, including conventional CBT, MBCT, ECBT, and digital CBT, as well as across outcome measures such as quality of life, anxiety, depression, body image, and C-reactive protein (CRP). In addition, several studies had short follow-up periods, limiting assessment of long-term effectiveness. Furthermore, reliance on self-reported measures and limited blinding may have introduced reporting and measurement bias.

CONCLUSION

Cognitive Behavioral Therapy (CBT) plays a significant role in improving the quality of life of patients with psoriasis by reducing psychological distress and enhancing emotional regulation. Findings from this review indicate that anxiety, depression, stress, and negative emotions such as shame and hopelessness are key determinants of reduced quality of life, often exerting a greater impact than the severity of skin lesions. By targeting cognitive distortions and maladaptive emotional responses, CBT helps patients develop more adaptive thinking patterns, greater emotional stability, and stronger internal psychological resources such as hope and resilience.

The findings of this review support the integration of CBT into multidisciplinary psoriasis management through collaboration between dermatologists and mental health professionals. This approach aligns with the biopsychosocial model of psoriasis, which recognizes that psychological distress may influence not only emotional and social functioning but also inflammatory processes associated with disease activity, including elevated C-reactive protein (CRP) levels, thereby contributing to reduced quality of life.

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Original Research

Nursing Diagnoses in Pediatric Surgical Inpatients: A Cross-Sectional Study

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ABSTRACT

Introduction: Children hospitalized in pediatric surgical units are vulnerable to physiological and psychological responses related to surgical procedures and underlying health conditions. Identification of nursing diagnoses is essential to guide clinical decision-making and provide appropriate nursing care. This study aimed to describe the profile of nursing diagnoses based on the Indonesian Nursing Diagnosis Standards (SDKI) among pediatric patients hospitalized in a pediatric surgical unit. Methods: A descriptive cross-sectional study with a retrospective design was conducted using medical records of pediatric patients treated in the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province, Indonesia, between December 2024 and March 2025. A total sampling technique was applied, including 107 pediatric patients aged 0–18 years with complete nursing assessment and diagnosis documentation. Data were analyzed and presented using frequencies and percentages based on the Indonesian Nursing Diagnosis Standards (SDKI). Results: Twelve actual nursing diagnoses were identified. Acute pain (D.0077) was the most prevalent diagnosis, occurring in 83 patients (77.6%). Nursing diagnoses were more frequently documented in the postoperative phase (56.1%) than in the preoperative phase (43.9%). The identified diagnoses were classified into psychological, physiological, and environmental domains, with physiological and psychological diagnoses predominating. Conclusion: Acute pain was the most common nursing diagnosis, particularly in the postoperative period. Comprehensive SDKI-based assessment and individualized nursing interventions are needed to address physical, psychological, and environmental needs and improve recovery outcomes.

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INTRODUCTION

Children undergoing surgical procedures often experience a wide range of physiological and psychological responses that require timely identification and management by healthcare professionals, particularly nurses. These responses may include physiological alterations, pain, anxiety, and functional disturbances occurring before and after surgery (Mathias & Pai, 2022). Such responses indicate that the nursing care needs of pediatric surgical patients are multidimensional and require systematic identification through accurate nursing diagnoses. Therefore, comprehensive assessment and precise identification of patient responses are essential components of high-quality nursing care for pediatric surgical patients.

Globally, the demand for pediatric surgical services continues to increase alongside advances in healthcare technology and improved access to medical services. In the United States alone, more than 3.9 million surgical procedures are performed annually on children and adolescents (Fletke et al., 2022). The types and causes of pediatric surgery vary across regions, reflecting geographical and socioeconomic contexts. In Africa, congenital anomalies, trauma, and infections are the leading indications for pediatric surgery (Hashish et al., 2021), whereas digestive disorders and congenital conditions are more common in India (Pathak et al., 2021). In North Korea, surgery is most frequently performed for injuries, tumors, and abdominal conditions (Hsu et al., 2024). In Indonesia, the Ministry of Health reported approximately 1,457 pediatric surgical cases between 2017 and 2021, with the most common conditions being hypospadias (14%), Hirschsprung disease (12%), inguinal hernia (7%), and phimosis/paraphimosis (7%), while trauma accounted for a smaller proportion of cases (Purnomo et al., 2024). Surgical procedures also rank as the eleventh most common medical intervention nationally, with approximately 32% classified as elective surgeries. Nevertheless, a substantial proportion of children continue to experience postoperative pain, indicating that effective pain management remains a significant challenge in pediatric care (Bustami et al., 2024).

The complexity of pediatric surgical units presents unique challenges for nursing professionals. Children's developmental characteristics influence how they understand health conditions, adapt to the hospital environment, and express their care needs. Differences in communication abilities and cognitive development across age groups require nurses to conduct comprehensive assessments and apply developmentally appropriate approaches (Hurley-wallace et al., 2019). These challenges demand heightened clinical sensitivity to ensure accurate and holistic patient assessment. In this context, nursing diagnoses play a crucial role in supporting systematic, measurable, and patient-centered clinical decision-making (Okpara, 2018). Nursing diagnoses not only guide the formulation of appropriate interventions but also facilitate professional communication among healthcare providers through standardized clinical language (Olatubi et al., 2019).

Nursing diagnosis is a fundamental component of the nursing process because it describes human responses to health problems and related conditions identified through nursing assessment (Bertocchi, et al., 2023). Accurate diagnoses provide the foundation for developing nursing care plans and selecting appropriate interventions to improve patient outcomes (D'Agostino et al., 2024). To enhance accuracy and consistency in nursing diagnosis, the use of standardized nursing terminology (SNT) is essential. SNT ensures consistency between nursing assessment data and documented care plans. Furthermore, standardized terminology is important for demonstrating the contribution and impact of nursing care on patient outcomes across diverse healthcare settings (Zhang et al., 2021).

Several studies have demonstrated that the use of standardized nursing terminology not only improves documentation quality but also supports clinical decision-making, enhances continuity of care, and facilitates objective evaluation of patient outcomes (Bertocchi, et al., 2023; Zhang et al., 2021). Moreover, standardized documentation enables epidemiological analysis of nursing diagnoses, measurement of healthcare quality indicators, and the development of more effective evidence-based nursing practices (Bertocchi, et al., 2023; D'Agostino et al., 2024).

Previous studies have identified various nursing diagnoses commonly observed among pediatric and surgical patients, including acute pain, risk for infection, impaired skin integrity, nutritional deficit, elimination disorders, and anxiety associated with surgical procedures and hospitalization (D'Agostino et al., 2024; Martinez et al., 2021). Studies involving postoperative pediatric surgical patients have also shown that nursing care needs extend beyond physical recovery to include psychological, developmental, and adaptive aspects that may influence the healing process (Marques et al., 2022; Mathias & Pai, 2022)

In Indonesia, national standards for nursing practice have been established through the Indonesian Nursing Diagnosis Standards (Standar Diagnosis Keperawatan Indonesia, SDKI), developed by the Indonesian National Nurses Association (Tim Pokja SDKI DPP PPN, 2016). SDKI serves as a guideline for nurses in identifying nursing diagnoses based on subjective data, objective findings, and potential patient problems. The implementation of SDKI is expected to promote a more systematic, accurate, and consistent diagnostic process, thereby improving documentation quality and overall nursing care quality (Tim Pokja SDKI DPP PPN, 2016). However, its implementation in healthcare facilities continues to face several challenges, including limited training opportunities, incomplete documentation, and inconsistent application of nursing diagnoses in daily clinical practice (Widodo et al., 2020).

Although several international studies have reported nursing diagnosis profiles among pediatric and surgical patients using NANDA International and other standardized terminologies, evidence regarding the distribution of nursing diagnoses among pediatric surgical patients in developing countries remains limited. To date, studies specifically describing nursing diagnosis profiles based on SDKI among pediatric surgical patients are still scarce. This gap limits understanding of the most prevalent nursing problems, the characteristics of diagnoses identified during hospitalization, and their relevance to patients' clinical conditions in real-world practice. Therefore, evaluating nursing diagnosis profiles based on SDKI among pediatric surgical patients is essential to provide a contemporary overview of nursing practice and support the development of standardized nursing care.

Arifin Achmad General Hospital, Riau Province, as a teaching hospital and regional referral center, plays a vital role in providing high-quality pediatric nursing services, including care for children undergoing surgical procedures. As a teaching institution, the quality of nursing diagnosis documentation also contributes to clinical education, evidence-based practice development, and continuous quality improvement in nursing services. However, the extent to which nursing diagnoses documented in the Pediatric Surgical Unit accurately reflect patients' clinical conditions and align with SDKI standards remains unclear. Therefore, this study aimed to identify and describe nursing diagnoses among pediatric patients hospitalized in the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province, based on the Indonesian Nursing Diagnosis Standards (SDKI). The findings are expected to provide empirical evidence to support standardized nursing practice, improve nursing documentation quality, and optimize nursing care planning for pediatric surgical patients.

METHOD

This study employed a descriptive cross-sectional design using retrospective medical records. The design was considered appropriate for describing the distribution and profile of nursing diagnoses among pediatric surgical inpatients during a specified period (Figueiredo et al., 2025). The study was conducted in the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province, Indonesia, a provincial referral and teaching hospital that serves as the main center for pediatric surgical services in the region. Data were obtained from medical records of pediatric patients hospitalized between December 2024 and March 2025. The records reviewed included structured nursing documentation, particularly nursing assessments and nursing diagnosis records.

A total sampling approach was employed, whereby all medical records meeting the eligibility criteria during the study period were included. A total of 107 pediatric patients were identified and analyzed. Inclusion criteria were: (1) pediatric patients aged 0–18 years, (2) admission to the Pediatric Surgical Unit during the study period, and (3) complete medical records containing nursing assessment and nursing diagnosis documentation. Exclusion criteria included incomplete medical records, particularly those lacking nursing diagnosis documentation, and patients admitted solely for observation or transferred to another unit before a complete nursing assessment was conducted.

Data were extracted using a structured data collection form and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were used to summarize the data. Categorical variables were presented as frequencies and percentages to describe the distribution of nursing diagnoses based on the Indonesian Nursing Diagnosis Standards (Standar Diagnosis Keperawatan Indonesia [SDKI])

Ethical approval was obtained from the Health Research Ethics Committee of Institut Kesehatan Payung Negeri, Pekanbaru (Approval No. 019/IKES PN/KEPK/IX/2024). Patient confidentiality and anonymity were maintained throughout the study using de-identified data, with access restricted to authorized research personnel only.

RESULT

A total of 107 pediatric patients admitted to the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province, were included in this study. The demographic characteristics of the participants are presented in Table 1.

Table 1. Demographic Characteristics of Participants in the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province (n = 107).

Variable	Category	n	%
Age (years)	0–1 (Infant)	21	19,6
	1–5 (Toddler)	24	22.4
	5–12 (School-age child)	34	31.8
	12–19 (Adolescent)	28	26.2
Sex	Male	88	82.2
	Female	19	17.8
Admission route	Emergency Room (ER)	77	72
	Outpatient Clinic	30	28
Perioperative Phase	Pre-operative	47	44
	Post-operative	60	56
Total		107	100

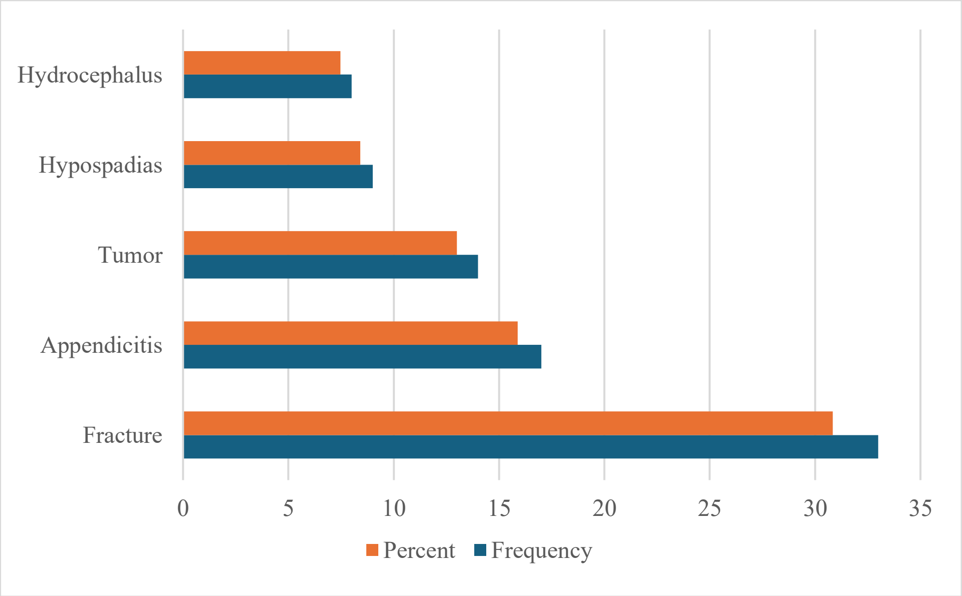

Fig. 1. Distribution of the Five Most Common Medical Diagnoses Among Pediatric Patients Hospitalized in the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province, Indonesia, During December 2024–March 2025

The analysis identified a diverse range of nursing diagnoses among pediatric surgical patients. A total of 12 actual nursing diagnoses were documented, with acute pain emerging as the most prevalent diagnosis. Detailed frequencies and percentages of each diagnosis are presented in Table 2.

Table 2. Most Common Actual Nursing Problems in the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province (n = 107)

No	Nursing Problems	SDKI Code	n	%
1	Acute Pain	(D.0077)	83	77.6
2	Decreased Intracranial Adaptive Capacity	(D.0066)	6	5.6
3	Constipation	(D.0049)	6	5.6
4	Impaired Urinary Elimination	(D. 0040)	2	1.9
5	Anxiety	(D.0080)	2	1.9
6	Nutritional Deficit	(D.0019)	2	1.9
7	Ineffective Airway Clearance	(D.0001)	1	0.9
8	Impaired Comfort	(D.0074)	1	0.9
9	Chronic Pain	(D.0078)	1	0.9
10	Impaired Skin Integrity	(D.0129)	1	0.9
11	Risk for Ineffective Peripheral Tissue Perfusion	(D.0015)	1	0.9
12	Disturbed Sleep Pattern	(D.0055)	1	0.9
Total			107	100

Table 3 shows the distribution of nursing diagnoses across the perioperative phases. Overall, nursing diagnoses were more frequently documented during the postoperative phase (56.1%) than during the preoperative phase (43.9%). Acute pain (D.0077) was the predominant diagnosis, accounting for 77.6% of all identified nursing problems, and was more common among postoperative patients (65.1%). Decreased intracranial adaptive capacity (D.0066) and constipation (D.0049) were primarily identified during the preoperative phase, whereas anxiety, nutritional deficit, and impaired urinary elimination were equally distributed between the two phases. These findings indicate that although a variety of nursing problems were observed throughout the perioperative period, acute pain remained the most prominent issue, particularly following surgery.

Table 3. Distribution of Nursing Diagnoses According to Perioperative Phase in the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province (n = 107)

Nursing Diagnosis	SDKI Code	Pre-operative n (%)	Post-operative n (%)	Total n (%)
Acute Pain	D.0077	29 (34.9)	54 (65.1)	83 (77.6)
Decreased Intracranial Adaptive Capacity	D.0066	5 (83.3)	1 (16.7)	6 (5.6)
Constipation	D.0049	5 (83.3)	1 (16.7)	6 (5.6)
Anxiety	D.0080	1 (50.0)	1 (50.0)	2 (1.9)
Nutritional Deficit	D.0019	1 (50.0)	1 (50.0)	2 (1.9)
Impaired Urinary Elimination	D.0040	1 (50.0)	1 (50.0)	2 (1.9)
Ineffective Airway Clearance	D.0001	1 (100.0)	0 (0.0)	1 (0.9)
Impaired Comfort	D.0074	1 (100.0)	0 (0.0)	1 (0.9)
Impaired Skin Integrity	D.0129	1 (100.0)	0 (0.0)	1 (0.9)
Risk for Ineffective Peripheral Tissue Perfusion	D.0015	1 (100.0)	0 (0.0)	1 (0.9)
Chronic Pain	D.0078	1 (100.0)	0 (0.0)	1 (0.9)
Disturbed Sleep Pattern	D.0055	0 (0.0)	1 (100.0)	1 (0.9)
Total		**47 (43.9)**	**60 (56.1)**	**107 (100)**

Table 4. Classification of Nursing Problems by Domain Based on SDKI in the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province

No	Category	Nursing Problems	Defining Characteristics
1	Psychological	Acute Pain (D.0077)	A sensory or emotional experience associated with actual or potential tissue damage, with a sudden or gradual onset and mild to severe intensity, lasting less than 3 months
2	Psychological	Anxiety (D.0080)	An emotional condition and subjective experience toward an unclear and unspecified object resulting from the anticipation of danger, which enables the individual to take action in response to the threat
3	Psychological	Impaired Comfort	A perceived lack of ease, relief, and transcendence in physical, psychospiritual, environmental, and social dimensions
4	Psychological	Chronic Pain	A sensory or emotional experience associated with actual or potential tissue damage, with a sudden or gradual onset, ranging from mild to severe intensity, persistent or recurrent in nature, and lasting longer than three months
5	Physiological	Decreased Intracranial Adaptive Capacity (D.0066)	A disturbance in the intracranial dynamic mechanism to compensate for stimuli that may reduce intracranial capacity.
6	Physiological	Constipation (D.0049)	Infrequent or difficult evacuation of dry, hard stools
7	Physiological	Impaired Urinary Elimination (D. 0040)	Dysfunction in urine elimination processes
8	Physiological	Nutritional Deficit (D.0019)	An intake of nutrients that is insufficient to meet the body's metabolic requirements.
9	Physiological	Ineffective Airway Clearance (D.0001)	The inability to clear secretions or obstructions from the airway to maintain a patent airway
10	Physiological	Risk for Ineffective Peripheral Tissue Perfusion (D.0015)	Being at risk for a decrease in blood circulation at the capillary level, which may impair tissue oxygenation, nutrient delivery, and cellular metabolism
11	Physiological	Disturbed Sleep Pattern (D.0055)	Disturbances in the quality and quantity of sleep due to external factors
12	Environment	Impaired Skin Integrity (D.0129)	Damage to the skin (dermis and/or epidermis) or tissue (mucous membranes, cornea, fascia, muscles, tendons, bones, cartilage, joint capsules, and/or ligaments).

Table 4 presents the identified nursing diagnoses grouped into three categories based on the Indonesian Nursing Diagnosis Standards (SDKI): psychological, physiological, and environmental. The psychological category comprised four nursing diagnoses, namely acute pain (D.0077), anxiety (D.0080), impaired comfort (D.0074), and chronic pain (D.0078), with acute pain being the most frequently identified. The physiological category included seven nursing diagnoses: decreased intracranial adaptive capacity (D.0066), constipation (D.0049), impaired urinary elimination (D.0040), nutritional deficit (D.0019), ineffective airway clearance (D.0001), risk for ineffective peripheral tissue perfusion (D.0015), and disturbed sleep pattern (D.0055), with decreased intracranial adaptive capacity and constipation being the most common. The environmental category consisted of one diagnosis, impaired skin integrity (D.0129), reflecting tissue damage involving the skin or underlying structures. Overall, pediatric surgical patients exhibited a broad range of psychological, physiological, and environmental responses, highlighting the need for comprehensive and holistic nursing care throughout the perioperative period.

DISCUSSION

This study described the profile of nursing diagnoses among patients admitted to the Pediatric Surgical Unit of Arifin Achmad General Hospital, Riau Province, based on the Indonesian Nursing Diagnosis Standards (SDKI). The findings indicate that pediatric surgical patients experienced a wide range of nursing problems throughout the perioperative period, with a greater number of diagnoses identified during the postoperative phase than during the preoperative phase. Furthermore, nursing diagnoses were predominantly classified into psychological and physiological categories, reflecting the complexity of children's responses to surgical procedures and recovery processes.

The most prominent finding of this study was the high prevalence of acute pain, which was identified in 77.6% of patients. This result suggests that pain remains the primary nursing problem among pediatric surgical patients. The high prevalence may be explained by tissue injury resulting from surgical procedures, postoperative inflammatory responses, and various nursing interventions performed during recovery, such as wound care, early mobilization, and the use of medical devices (Hu & Shang, 2024). In addition, developmental characteristics may limit children's ability to recognize and communicate pain effectively, highlighting the need for comprehensive and age-appropriate pain assessment strategies

These findings are consistent with previous international studies reporting pain as one of the most common problems among pediatric surgical patients. Previous studies have shown that 75–88% of children experience pain within the first 24 hours after surgery (Senger et al., 2021). Similarly, Liu et al. (2023) reported that nearly half of pediatric patients continued to experience moderate-to-severe pain despite receiving standard analgesic therapy. (Rede et al., 2024) further found that a substantial proportion of children continued to report pain up to 36 hours after surgery. Collectively, these findings reinforce the present study's conclusion that pain remains a major focus of nursing care in pediatric surgical settings.

The predominance of acute pain during the postoperative period is also consistent with the physiological processes associated with surgery. In this study, acute pain was more frequently identified in postoperative patients than in preoperative patients. Similar findings were reported by Yücel & Küçük (2024), who observed significantly higher pain intensity following surgical procedures. Postoperative pain typically develops within the first 24–72 hours after surgery and may persist for several days depending on the type of procedure, the extent of tissue trauma, and the effectiveness of pain management interventions (Tao et al., 2024). Factors such as major surgery, prolonged operative duration, larger incision size, preoperative pain, and preoperative anxiety have been identified as predictors of more severe postoperative pain (Rebollar et al., 2025).

In addition to physiological factors, children's psychological conditions may contribute substantially to pain experiences. Several studies have demonstrated that preoperative anxiety is associated with increased postoperative pain perception and greater analgesic requirements (Gao et al., 2024; Mathias & Pai, 2022). Uncertainty regarding medical procedures, unfamiliar hospital environments, and fear of invasive interventions may trigger stress responses that amplify pain perception. Stress-induced activation of neuroendocrine pathways may increase pain sensitivity and delay recovery (Ni et al., 2023). Therefore, pain management strategies for pediatric surgical patients should address both physiological and psychological dimensions.

The findings also revealed that the identified nursing diagnoses could be grouped into three major SDKI categories: psychological, physiological, and environmental. The psychological category included acute pain, anxiety, impaired comfort, and chronic pain. Among these diagnoses, acute pain was the most prevalent, followed by anxiety. These findings suggest that surgical experiences affect not only children's physical conditions but also their emotional and psychological well-being. Hospitalization, invasive procedures, unfamiliar environments, and uncertainty related to surgery may act as significant stressors that contribute to anxiety and discomfort among pediatric patients (Stanzel & Sierau, 2022). Consequently, comprehensive psychological assessment should be integrated into perioperative nursing care to support patient adaptation and recovery.

Within the physiological category, the most frequently identified diagnoses were decreased intracranial adaptive capacity, constipation, and impaired urinary elimination, followed by nutritional deficit, ineffective airway clearance, risk for ineffective peripheral tissue perfusion, and disturbed sleep pattern. These diagnoses may be associated with the effects of anesthesia, immobilization, altered dietary intake, analgesic use, and physiological responses to surgical trauma. These findings are consistent with previous research indicating that postoperative pediatric patients are vulnerable to elimination disturbances, nutritional problems, sleep disruptions, and other physiological complications that require continuous monitoring and nursing interventions (Okpara, 2018).

The environmental category was represented by impaired skin integrity, reflecting damage to the skin or underlying tissues. This diagnosis may be associated with surgical wounds, medical device placement, and other factors affecting tissue integrity during hospitalization. Overall, these findings emphasize that pediatric surgical patients have multidimensional care needs and require holistic, integrated, and patient-centered nursing care to optimize recovery and quality of care (Bielicki et al., 2022). Furthermore, postoperative immobilization and the use of invasive devices may increase the risk of impaired skin integrity among hospitalized children (Kalhor et al., 2025). Therefore, regular skin assessment, appropriate wound care, and preventive strategies for skin injury should be considered essential components of perioperative nursing care.

Overall, the findings of this study demonstrate that pediatric surgical patients experience multidimensional nursing care needs encompassing physical, psychological, and functional aspects. The use of SDKI facilitates systematic and standardized identification of nursing problems, enabling nurses to establish care priorities, plan appropriate interventions, and evaluate patient outcomes more objectively. These findings provide valuable evidence regarding the most common nursing diagnoses among pediatric surgical patients in Indonesia and may serve as a foundation for developing evidence-based nursing practice, improving documentation quality, and strengthening pain management and psychological support programs for children undergoing surgical treatment.

CONCLUSION

This study identified acute pain as the most prevalent nursing diagnosis among pediatric surgical inpatients, followed by anxiety as an important psychological problem. The predominance of psychological and physiological nursing diagnoses highlights the multidimensional responses of children to surgical treatment and hospitalization. The findings underscore the importance of comprehensive SDKI-based nursing assessment to support accurate diagnosis identification, individualized care planning, and holistic interventions throughout the perioperative period.

Based on these findings, the Pediatric Surgical Unit of Arifin Achmad General Hospital is encouraged to strengthen routine assessment and management of pain and anxiety, particularly during the postoperative period. Consistent implementation of SDKI in nursing documentation and clinical practice, supported by regular training and evaluation, may improve diagnostic accuracy and the quality of nursing care. In addition, integrating family-centered approaches and psychological preparation into perioperative care may contribute to improved recovery outcomes and a more positive hospitalization experience for pediatric patients.

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Original Research

Determinants of Anemia among Pregnant Women at UPTD Puskesmas Seba, Sabu Raijua Regency

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ABSTRACT

Anemia during pregnancy remains a major public health problem associated with adverse maternal and fetal outcomes. This study aimed to analyze the determinants of anemia among pregnant women at UPTD Puskesmas Seba. A cross-sectional study was conducted involving 59 pregnant women. Data were collected using structured questionnaires and medical records and analyzed using chi-square tests. The study was conducted from January to June 2025. The results showed that 45.8% of respondents experienced anemia. Significant associations were found between gestational age ($p = 0.049$), nutritional status ($p < 0.001$), and socio-cultural factors ($p < 0.001$) with anemia incidence. However, parity was not significantly associated with anemia ($p = 0.807$). The findings indicate that anemia is a multifactorial condition influenced by physiological, nutritional, and socio-cultural determinants. Strengthening antenatal care, improving maternal nutrition, and addressing socio-cultural barriers are essential to reduce anemia prevalence among pregnant women.

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INTRODUCTION

Anemia during pregnancy remains a major global public health problem, affecting approximately 37–40% of pregnant women worldwide and contributing to maternal and perinatal morbidity and mortality (WHO, 2025). Although its impact on adverse outcomes such as preterm birth, low birth weight, and maternal complications has been widely documented, the persistence of high prevalence indicates that existing prevention strategies remain insufficient, particularly in low- and middle-income countries.

In Indonesia, anemia in pregnancy continues to be a significant health burden. The 2023 Indonesia Health Survey reported a prevalence of 27.7%, showing improvement from 48.9% in 2018; however, the rate remains high compared to several Southeast Asian countries, indicating uneven progress in maternal nutrition programs (Ministry of Health, 2023; Zheng et al., 2025). This suggests that national interventions such as iron supplementation and antenatal care coverage have not fully addressed the underlying determinants of anemia.

Previous studies have identified multiple contributing factors to anemia in pregnancy. Gestational age has been consistently associated with increased iron demand due to physiological changes across trimesters (Fitri et al., 2023; Aballo et al., 2025). Similarly, nutritional status is widely recognized as a strong predictor of anemia; however, while several studies report a significant relationship between chronic energy deficiency and anemia (Utama, 2021; Agusmarinda et al., 2025), others suggest that the effect may be influenced by dietary diversity and supplementation adherence.

In contrast, evidence regarding parity remains inconsistent, with some studies reporting significant associations due to depletion of iron stores in multiparous women (Yuvita et al., 2024), while others find no independent effect after controlling for socioeconomic and nutritional factors (Viamita et al., 2022; Alem et al., 2023). Sociocultural determinants such as food taboos, family support, and health-seeking behavior have also been identified as important contextual factors influencing maternal nutrition; however, their role is often understudied or analyzed separately rather than within an integrated framework (Hairuddin et al., 2024; Qamariyah et al., 2025). This inconsistency across studies highlights the need for context-specific and multidimensional analysis.

At the local level, anemia prevalence among pregnant women in Sabu Raijua Regency remains high, reaching 48.7% at Seba Community Health Center in 2024, exceeding the national average. Despite this burden, limited studies have simultaneously examined biological, nutritional, and sociocultural determinants in this setting. Most existing research tends to focus on isolated factors, which limits understanding of their combined effects in rural populations.

Therefore, this study aimed to analyze the relationship between gestational age, parity, nutritional status, and sociocultural factors with anemia incidence among pregnant women at Seba Community Health Center, Sabu Raijua Regency. The findings are expected to contribute to strengthening evidence-based maternal health interventions in high-burden rural areas.

METHOD

This cross-sectional study used secondary data from Maternal and Child Health (MCH) registers, antenatal care (ANC) records, and cohort monitoring sheets at Seba Community Health Center (UPTD Puskesmas), Sabu Raijua Regency, from January to June 2025. The study population included 346 pregnant women, of whom 59 were selected through purposive sampling based on complete medical records.

A total of 287 records were excluded due to missing hemoglobin results (n = 214) and incomplete data on key variables (n = 73). Additional exclusions included pregnant women with conditions that could affect hemoglobin levels, such as HIV/AIDS, malaria, tuberculosis, chronic kidney disease, thalassemia, and malignancies.

The study included one dependent variable and six independent variables. The dependent variable was anemia status, defined as hemoglobin <11 g/dL (trimester I and III) and <10.5 g/dL (trimester II). Independent variables were gestational age, parity, nutritional status (MUAC; CED <23.5 cm), maternal age, education level, and sociocultural factors.

Sociocultural factors were derived from secondary records assessing food taboos, family support, ANC attendance, and iron supplementation adherence and were categorized as positive or negative conditions. All data were obtained from routine health records without primary data collection.

Data were analyzed using univariate analysis and chi-square tests, with a significance level of $p < 0.05$. Ethical approval was obtained from the relevant ethics committee, and permission to access data was granted by Seba Community Health Center. All data were anonymized to maintain confidentiality.

RESULT

Univariate Analysis

Table 1. Frequency Distribution of Pregnant Women's Ages at the Seba Community Health Center

Age of Pregnant Women	f	%
<20 years old (Risky)	1	1,7
20-35 years old (Not Risky)	45	76,3
>35 years old (High Risk)	13	22
Total	**59**	**100%**

Based on Table 1, the majority of pregnant women were aged 20–35 years (76.3%). This was followed by those aged >35 years (22%), while a small proportion were aged <20 years (1.7%). The findings indicate that most respondents were within the 20–35 years age group, which is generally considered the optimal reproductive age due to lower maternal risk. However, a notable proportion of pregnant women belonged to high-risk age groups (<20 and >35 years). These age groups are associated with increased maternal risks, including pregnancy complications and a higher likelihood of anemia, which may be related to impaired iron metabolism and physiological adaptation during pregnancy.

Table 2. Frequency Distribution of Pregnancy Age Among Pregnant Women at the Seba Community Health Center

Gestational Age	f	%
Trimester I (0-<13 mg) (Risky)	23	39
Trimester II (13-<28 mg) (Not Risky)	28	47,5
Trimester III (>28 mg) (High Risk)	8	13,6
Total	**59**	**100%**

Based on Table 2, most pregnant women at Seba Community Health Center were in the second trimester (47.5%), followed by the first trimester (39%) and the third trimester (13.6%). Gestational age is an important factor related to maternal health conditions, including anemia risk. The second trimester is generally considered a relatively stable period of pregnancy, during which antenatal care attendance tends to increase. However, the first trimester is a critical phase in which physiological adaptation begins, and iron requirements start to increase, making women susceptible to anemia if nutritional intake is inadequate. In contrast, although the proportion of women in the third trimester is lower, this stage is associated with a higher risk of anemia due to increased blood volume expansion and greater iron demand in preparation for delivery. These findings suggest that anemia prevention efforts should be implemented throughout pregnancy, with particular attention to early and late gestational stages through adequate nutrition, hemoglobin monitoring, and regular antenatal care

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Table 3. Frequency Distribution of Parity Among Pregnant Women at the Seba Community Health Center

Maternal Parity	f	%
Risky (≥3)	23	39
Not Risky (<3)	36	61
Total	**59**	**100%**

Based on Table 2, most pregnant women at Seba Community Health Center were in the second trimester (47.5%), followed by the first trimester (39%) and the third trimester (13.6%). Gestational age is an important factor related to maternal health conditions, including anemia risk. The second trimester is generally considered a relatively stable period of pregnancy, during which antenatal care attendance tends to increase. However, the first trimester is a critical phase in which physiological adaptation begins and iron requirements start to increase, making women more susceptible to anemia if nutritional intake is inadequate. In contrast, although the proportion of women in the third trimester is lower, this stage is associated with a higher risk of anemia due to increased blood volume expansion and greater iron demand in preparation for delivery. Overall, these findings suggest that anemia prevention efforts should be implemented throughout pregnancy, with particular attention to early and late gestational stages through adequate nutrition, hemoglobin monitoring, and regular antenatal care.

Table 4. Frequency Distribution of Nutritional Status of Pregnant Women at the Seba Community Health Center

Nutritional Status of Pregnant Women	f	%
Chronic Energy Deficiency (CED)	18	30,5
No CED	41	69,5
Total	**59**	**100%**

Based on Table 4, most pregnant women at Seba Community Health Center had good nutritional status (69.5%), while 30.5% experienced chronic energy deficiency (CED). Nutritional status is a key determinant of maternal and fetal health during pregnancy. Although most respondents were classified as having adequate nutritional status, a considerable proportion still experienced CED. This condition may adversely affect fetal growth and development and increase the risk of pregnancy complications, including low birth weight. Therefore, strengthening maternal nutrition through health education, regular nutritional monitoring, and continuous support from healthcare providers is essential to reduce the prevalence of CED and improve pregnancy outcomes.

Table 5. Distribution of Socio-Cultural Characteristics of Pregnant Women at the Seba Community Health Center

Anemia in Pregnant Women	**f**	**%**
Negative	32	54,2
Positive	27	45,8
Total	**59**	**100%**

Based on Table 5, most pregnant women at Seba Community Health Center were not anemic (54.2%), while 45.8% experienced anemia. The findings indicate that although more than half of the respondents had normal hemoglobin levels, the proportion of anemia remains relatively high. This condition may be influenced by socio-cultural factors, including dietary habits, food restrictions, level of nutritional knowledge, and family support. These factors can affect dietary intake and iron consumption during pregnancy, thereby contributing to the occurrence of anemia.

Table 6. Frequency Distribution of Anemia in Pregnant Women at the Seba Community Health Center

Anemia in Pregnant Women	**f**	**%**
Anemia	27	45,8
No Anemia	32	54,2
Total	**59**	**100%**

Based on Table 6, 54.2% of pregnant women at Seba Community Health Center were not anemic, while 45.8% had anemia, indicating a relatively high prevalence. The findings suggest that anemia remains a significant health problem among pregnant women. This condition may be associated with several contributing factors, including inadequate iron intake, poor nutritional status, closely spaced pregnancies, and low adherence to iron supplementation. These factors can negatively affect hemoglobin levels during pregnancy. The results of this study are consistent with Harahap (2021), who reported that anemia in pregnancy is a major nutritional problem that increases the risk of complications for both mothers and fetuses.

Bivariate Analysis

The results of the analysis of the relationship between gestational age and parity with the incidence of anemia in pregnant women at UPTD Puskesmas Seba, Sabu Raijua Regency, are as follows:

Table 7. Relationship between Gestational Age and Anemia Incidence in Pregnant Women at UPTD Puskesmas Seba, Sabu Raijua District

Gestational Age	No Anemia	Anemia (n/%)	Total (n/%)	*p-value*
Trimester I (0–<13 weeks)	3 (5.1%)	3 (5.1%)	3 (5.1%)	
Trimester II (13–<28 weeks)	2 (3,4%)	26 (44,1%)	28 (47,5%)	0,049
Trimester III (>28 weeks)	0 (0%)	8 (13,6%)	8 (13,6%)	
Total	**5 (8.5%)**	**5 (8.5%)**	**5 (8.5%)**	

Based on Table 7, most pregnant women with anemia were in the second trimester (44.1%), followed by the first trimester (33.9%) and the third trimester (13.6%). Meanwhile, women without anemia were predominantly in the first and second trimesters, while none were recorded in the third trimester. The Chi-square test showed a statistically significant association between gestational age and anemia incidence (p = 0.049), indicating that gestational age is significantly associated with the occurrence of anemia among pregnant women.

Table 8. Relationship between Parity and Anemia in Pregnant Women at UPTD Puskesmas Seba, Sabu Raijua District

Parity	No Anemia (n/%)	Anemia (n/%)	Total (n/%)	*p-value*
Risky (≥3)	1 (1,7%)	22 (37,3%)	23 (39%)	
Not Risky(<3)	4 (6,8%)	32 (54,2%)	36 (61%)	0,807
Total	5 (8,5%(	54 (91,5%)	59 (100%)	

Based on Table 8, anemia was more prevalent among pregnant women in the non-risk parity group (54.2%) compared to the risk parity group (37.3%). Meanwhile, the proportion of non-anemic women was relatively low in both groups. The Chi-square test showed no statistically significant association between parity and anemia incidence (p = 0.807), indicating that parity was not associated with anemia status in this study.

Table 9. Relationship between Nutritional Status and Anemia Incidence in Pregnant Women at UPTD Puskesmas Seba, Sabu Raijua District

Categories	Anemia (n/%)	No Anemia (n/%)	Total (n/%)	*p-value*
CED	16 (88,9%)	2 (11,1%)	18 (100%)	
No CED	12 (29,3%)	29 (70,7%)	41 (100%)	0,001
Total	28 (47,5%)	31 (52,5%)	59 (1005)	

Based on Table 9, anemia was more prevalent among pregnant women with chronic energy deficiency (CED) (88.9%) compared to those without CED (29.3%). Conversely, the majority of pregnant women without CED did not experience anemia (70.7%). The Chi-square test showed a statistically significant association between nutritional status and anemia incidence (p = 0.001), indicating that nutritional status is associated with anemia among pregnant women. Pregnant women with CED are more likely to experience anemia due to inadequate intake of essential nutrients, including iron, folic acid, and protein, which are required for hemoglobin synthesis. Poor nutritional status reduces the body's ability to meet increased physiological demands during pregnancy, thereby increasing the risk of anemia. These findings are consistent with previous studies reporting that maternal nutritional status is a major determinant of anemia during pregnancy.

Table 10. Relationship between Socio-Cultural Factors and Anemia in Pregnant Women at UPTD Puskesmas Seba, Sabu Raijua District

Categories	Anemia (n/%)	No Anemia (n/%)	Total (n/%)	*p-value*
Negative	28 (87,5%)	4 (12,5%)	32 (100%)	
Positive	0 (0%)	27 (100%)	27 (100%)	0,001
Total	28 (47,5%)	31 (52,5%)	59 (1005)	

Based on Table 10, most pregnant women with negative socio-cultural factors experienced anemia (87.5%), while all respondents with positive socio-cultural conditions were not anemic (100%). The Chi-square test indicated a statistically significant association between socio-cultural factors and anemia incidence (p = 0.001), suggesting that socio-cultural conditions are associated with anemia status among pregnant women. Negative socio-cultural factors, such as food taboos, low family support, and infrequent antenatal care visits, are associated with an increased risk of anemia in pregnancy. In contrast, positive socio-cultural environments encourage healthier behaviors, including regular antenatal care visits, adherence to iron supplementation, and adequate nutritional intake. These conditions play an important role in shaping maternal health behaviors and influencing anemia prevention during pregnancy.

DISCUSSION

Univariate Analysis

Maternal Age

Most respondents were aged 20–35 years (76.3%), followed by those aged >35 years (22.0%) and <20 years (1.7%). This indicates that pregnancy in the study area predominantly occurs within the reproductive age group.

This finding is consistent with studies reporting that 20–35 years is the optimal reproductive age due to mature reproductive function and better physiological adaptation. In contrast, pregnancy at <20 years is associated with biological immaturity, while age >35 years is linked to declining physiological reserves and an increased risk of anemia and obstetric complications (Obianeli, 2024; Rosita & Afrianti, 2021; Pitriani et al., 2023).

The relatively high proportion of women aged >35 years is noteworthy, as advanced maternal age has been associated with reduced iron reserves and a higher risk of comorbidities (Noli et al., 2021; Mardiah et al., 2021). These findings reinforce reproductive age as an important determinant of maternal health outcomes.

Gestational Age

Most respondents were in the second trimester (47.5%), followed by the first trimester (39.0%) and third trimester (13.6%). This distribution is consistent with antenatal care patterns, where the second trimester is considered a relatively stable phase that encourages increased utilization of health services. Previous studies indicate that anemia risk increases as pregnancy progresses, particularly in the second and third trimesters, due to rising iron requirements and plasma volume expansion (Aballo, 2025; De Freitas-Costa, 2025). These findings highlight the importance of early initiation of antenatal care and continuous monitoring throughout pregnancy, particularly from the first trimester.

Maternal Parity

Most respondents were in the non-risk parity group (<3 births) at 61.0%, while 39.0% were in the high-risk group (≥3 births). This finding aligns with studies suggesting that high parity may increase the risk of anemia due to repeated depletion of iron stores across successive pregnancies and lactation periods. However, literature also indicates that parity alone is not always an independent predictor of anemia, as its effect is influenced by nutritional status, birth spacing, and antenatal care utilization (Viamita, 2022; Alem, 2023). Thus, parity should be considered a contextual factor rather than a sole determinant of maternal anemia.

Nutritional Status (CED)

Most respondents had normal nutritional status (69.5%), while 30.5% experienced chronic energy deficiency (CED). This result is consistent with studies indicating that maternal nutritional status is a key determinant of anemia during pregnancy. CED reflects long-term inadequate intake of essential nutrients such as iron, folic acid, and protein, which are required for hemoglobin synthesis (Saputro, 2022; Yuristrianti et al., 2024). Previous studies consistently report that poor nutritional status increases the risk of anemia, whereas adequate nutrition acts as a protective factor (Fakhriza et al., 2024; Ermanto, 2025).

Socio-Cultural Factors

Most respondents had positive socio-cultural conditions (approximately 57.6%), while the rest were categorized as negative. Studies show that the socio-cultural environment plays a major role in shaping maternal dietary behavior and healthcare utilization. Similar research reports that cultural beliefs, food taboos, and family support significantly influence nutritional intake during pregnancy (Hairuddin, 2024; Qamariyah, 2025; Gustanela, 2022). Supportive environments promote better antenatal care attendance and supplementation adherence, whereas negative environments reduce iron intake and increase the risk of anemia.

Anemia Status

Most respondents were not anemic (54.2%), while 45.8% had anemia. This prevalence indicates that anemia remains a moderate public health problem among pregnant women in the study area. Similar findings have been reported in other developing settings, where anemia persists despite supplementation programs due to dietary insufficiency and limited adherence to iron supplementation guidelines (Harahap, 2021; WHO, 2021).

Bivariate Analysis

Gestational Age and Anemia

The analysis showed a significant association between gestational age and anemia (p = 0.049). Anemia cases were more frequently observed among women in the second trimester, followed by the first and third trimesters. This finding is consistent with studies reporting that anemia risk increases during pregnancy due to progressive physiological changes, particularly plasma volume expansion and increased fetal iron demand. The second trimester represents a transitional phase in which maternal iron requirements rise significantly, while the third trimester is associated with the highest physiological demand (Aballo, 2025; De Freitas-Costa, 2025). Compared to previous studies, this pattern confirms that gestational age is an important determinant of anemia, although it should not be interpreted as a causal factor. Other variables such as dietary intake, iron supplementation adherence, and infection status may also influence hemoglobin levels (Chen, 2024). These findings highlight the importance of early antenatal screening and continuous monitoring throughout all trimesters, particularly starting from the first trimester.

Parity and Anemia

No significant association was found between parity and anemia (p = 0.807), indicating that parity does not independently influence anemia status among the respondents. This result is consistent with several studies reporting that parity alone is not a strong predictor of anemia when confounding factors such as nutritional intake, birth spacing, and antenatal care utilization are considered (Viamita, 2022; Alem, 2023). However, other studies suggest that high parity may contribute to iron depletion due to repeated pregnancies and lactation, particularly in populations with poor nutritional status. The inconsistency between studies suggests that parity functions more as a contextual risk factor rather than an independent determinant of anemia. Therefore, maternal anemia should be understood as a multifactorial condition influenced by both biological and behavioral factors.

Nutritional Status (CED) and Anemia

A significant association was found between nutritional status and anemia ($p < 0.001$), indicating that chronic energy deficiency (CED) is associated with an increased risk of anemia. Pregnant women with CED had a markedly higher proportion of anemia compared to those without CED. This can be biologically explained by insufficient intake of essential nutrients such as iron, folic acid, and protein, which are required for hemoglobin synthesis and erythropoiesis (Utama, 2021). These findings are strongly supported by previous studies reporting that poor maternal nutritional status significantly increases the risk of anemia during pregnancy (Agusmarinda, 2025; Hidayah, 2025). Nutritional deficiencies not only affect maternal hemoglobin levels but also contribute to adverse fetal outcomes. Compared with prior research, this study reinforces nutritional status as a key determinant of anemia, emphasizing that iron supplementation alone is insufficient without adequate overall dietary intake.

Socio-Cultural Factors and Anemia

A highly significant association was found between socio-cultural factors and anemia ($p < 0.001$). Women with negative socio-cultural conditions had a much higher prevalence of anemia compared to those with positive conditions. This finding aligns with previous research showing that the socio-cultural environment strongly influences maternal health behaviors, including dietary practices, healthcare utilization, and adherence to iron supplementation (Satriani et al., 2025; Zein, 2025; Hairuddin et al., 2024). Negative socio-cultural influences such as food taboos, low family support, and infrequent antenatal care visits reduce nutritional intake and limit access to preventive services. In contrast, positive socio-cultural environments encourage healthy dietary habits, supplementation adherence, and regular antenatal care visits. Compared with other studies, this result highlights that anemia prevention cannot rely solely on medical interventions but must also address cultural beliefs and family-level support systems.

CONCLUSION

The study found a high prevalence of anemia among pregnant women (45.8%). Gestational age, nutritional status, and socio-cultural factors were significantly associated with anemia, while parity was not. Anemia was more common in early trimesters and among women with poor nutritional status or negative socio-cultural conditions. These findings highlight the need for early screening, nutritional improvement, iron supplementation, and attention to socio-cultural influences, supported by healthcare providers and families. Further large-scale longitudinal studies are recommended.

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Original Research

The Relationship between Knowledge of Phlebitis and Motivation for Phlebitis Prevention among Nursing Students in Tangerang

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ABSTRACT

Phlebitis is a common nosocomial infection caused by invasive procedures such as intravenous catheter insertion, and it may lead to serious complications. Therefore, enhancing knowledge of phlebitis and motivation for its prevention is crucial among professional nursing students. This study aimed to identify the relationship between knowledge of phlebitis and motivation for phlebitis prevention among professional nursing students at a university in Tangerang. This study employed a quantitative correlational design with a cross-sectional approach. Participants were professional nursing students ($n = 176$) selected through purposive sampling. Data were collected using knowledge and motivation questionnaires. The results showed that most participants (56.8%) had poor knowledge of phlebitis; however, the majority of participants (80.7%) demonstrated high motivation for phlebitis prevention. Furthermore, the Spearman's rank correlation test revealed a moderate positive relationship between knowledge of phlebitis and motivation for phlebitis prevention ($r = 0.423$, $p < 0.001$), indicating that higher levels of knowledge of phlebitis were related to greater motivation to engage in phlebitis prevention. Although professional nursing students showed high motivation for phlebitis prevention, their level of knowledge remained inadequate. Strengthening educational strategies, including theoretical reinforcement, simulation-based learning, and structured clinical training, is necessary to improve students' knowledge and preparedness for safe nursing practice.

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INTRODUCTION

Phlebitis is an inflammation of the veins that occurs as a result of mechanical or chemical irritation, often caused by invasive procedures such as the insertion of an intravenous catheter. Common symptoms include redness, tenderness, and swelling around the infusion site (Cahyadi et al., 2020). If left untreated, phlebitis can progress to thrombophlebitis

and lead to serious complications such as embolism and permanent damage to the vein (Rahmawati et al., 2020). This condition is classified as a nosocomial or hospital-acquired infection (HAI), which frequently occurs in healthcare settings (Mariana & Asrul, 2020).
According to the Global Report on Infection Prevention and Control 2024, on average, out of every 100 patients admitted to acute care hospitals, seven patients in high-income countries (HICs) and 15 patients in low- and middle-income countries (LMICs) experience at least one HAI during hospitalization (WHO, 2024). In Indonesia, the Ministry of Health has established that the acceptable incidence rate of phlebitis should not exceed 1% (Tahir et al., 2023). Nevertheless, data regarding the incidence of phlebitis in Indonesia over the past five years remain limited. The most recent available data are based on the 2013 Ministry of Health survey, which reported phlebitis incidence rates of 50.11% in public hospitals and 32.70% in private hospitals (Tahir et al., 2023).

The high incidence of phlebitis indicates that phlebitis prevention efforts have not been optimal. Phlebitis prevention requires not only technical skills but also adequate knowledge of aseptic principles, appropriate selection of intravenous insertion sites, and early detection of phlebitis symptoms (Hafidhuddin et al., 2022). As future healthcare professionals who are involved in intravenous catheter insertion during clinical practice, nursing students need to understand and properly implement phlebitis prevention measures. Hafidhuddin et al. (2022) found that the majority of final-year nursing students at Universitas Binawan had a moderate level of knowledge regarding phlebitis.

However, good knowledge alone is not sufficient to ensure optimal preventive behavior. This indicates that although students' knowledge level is categorized as moderate, it does not necessarily translate into optimal phlebitis prevention practices in clinical settings. Intrinsic and extrinsic motivation play an important role in ensuring compliance with clinical procedures, including phlebitis prevention. According to motivation theory, individual actions are influenced by internal needs as well as environmental factors that drive a person to act (Demang et al., 2022). In line with this, compliance with standard operating procedures (SOPs) for intravenous catheter insertion is also one of the factors that may influence the occurrence of phlebitis in patients (Safitri et al., 2023).

A study conducted by Hafidhuddin et al. (2022b) showed that nursing students' level of knowledge regarding phlebitis was still suboptimal, with 45.5% of participants having a moderate level of knowledge, 43.2% having a low level of knowledge, and only 11.4% demonstrating a good level of knowledge. These findings indicate a knowledge gap that may affect students' ability to implement phlebitis prevention measures during clinical practice. Furthermore, Ulfa et al. (2025) found that motivation was significantly associated with nurses' compliance with standard precautions (p-value = 0.010), suggesting that higher motivation can improve adherence to infection prevention procedures. In the context of nursing students, strong motivation may similarly encourage the implementation of phlebitis prevention measures in accordance with clinical practice standards.

However, studies specifically examining the relationship between knowledge of phlebitis and motivation for phlebitis prevention among nursing students remain limited. This gap highlights the need for further research to analyze how knowledge influences students' motivation to prevent phlebitis. Therefore, based on this phenomenon, the present study aimed to investigate the relationship between knowledge of phlebitis and motivation for phlebitis prevention among nursing students at a university in Tangerang.

METHOD

This study employed a quantitative correlational design with a cross-sectional approach to examine the relationship between knowledge of phlebitis and motivation for phlebitis prevention. The population consisted of 263 professional nursing students at a private university in Tangerang, Indonesia. Participants were recruited using a purposive sampling technique, with a minimum sample size of 176, determined using the Slovin formula with a 5% margin of error and a 10% anticipated dropout rate.

Participants were eligible for inclusion if they were actively enrolled in the Entry-to-Practice or Conversion Class nursing professional programs. The exclusion criteria included students who were on leave of absence, inactive in the program, undergoing academic suspension or disciplinary sanctions, and those who had participated in the preliminary validity and reliability testing of the research instruments.

The instruments used in this study were digital questionnaires consisting of demographic data (age and gender), a phlebitis knowledge questionnaire developed by Yuhelma et al. (2019) comprising 8 multiple-choice questions, and a motivation for phlebitis prevention questionnaire developed by Rinawan (2024) consisting of 10 Likert-scale statements. Prior to data collection, the research instruments were tested for validity and reliability on February 28, 2025, among professional nursing students. The results showed that all items in both questionnaires were valid, with corrected item-total correlation values exceeding 0.361. Furthermore, both instruments demonstrated acceptable reliability, with Cronbach's alpha coefficients of 0.616 for the phlebitis knowledge questionnaire and 0.767 for the motivation for phlebitis prevention questionnaire. According to the criteria proposed by Hastono (2021), a Cronbach's Alpha value greater than 0.60 indicates good reliability; therefore, both questionnaires were considered reliable.

Data were collected after obtaining approval from the Ethics Committee of the Faculty of Nursing, Universitas Pelita Harapan (No. 022/KEPFON-AMENDMENT/V/2025) and permission from the faculty. Before data collection, the researcher conducted validity and reliability testing of the research instruments. After the instruments were confirmed to be valid and reliable, the questionnaires were distributed digitally via Google Forms, accompanied by an informed consent form. Descriptive statistics were used to describe participants' characteristics, levels of knowledge of phlebitis, and motivation for phlebitis prevention, while Spearman's rank-order correlation test was used to examine the relationship between knowledge of phlebitis and motivation for phlebitis prevention.

RESULT

A total of 176 professional nursing students participated in this study. The majority of participants were in the late adolescence age group (18–21 years), representing 56.3% of the sample, while female students accounted for 93.8% of the study population (Table 1).

Table 1. Sociodemographic Characteristics (n=176)

Characteristics	Frequency (n)	Percentage %
Age		
Late adolescence (18-21 years)	99	56.3
Early adulthood (22-25 years)	77	43.8
Gender		
Male	11	6.3
Female	165	93.8

As shown in Table 2, poor knowledge of phlebitis was the most prevalent category among participants, representing 56.8% of the study population. In contrast, only a small proportion of participants demonstrated good knowledge of phlebitis (2.3%).

Table 2. Phlebitis Knowledge of Professional Nursing Students (n=176)

Category	Frequency (n)	Percentage (%)
Good	4	2.3
Moderate	72	40.9
Poor	100	56.8

The majority of participants demonstrated a high level of motivation for phlebitis prevention, accounting for 80.7% of the study population (Table 3).

Table 3. Motivation for Phlebitis Prevention of Professional Nursing Students (n=176)

Category	Frequency (n)	Percentage (%)
High	142	80.7
Low	34	19.3

As presented in Table 4, Spearman's rank-order correlation test indicated a moderate positive relationship between knowledge of phlebitis and motivation for phlebitis prevention among professional nursing students (r = 0.423, p < 0.001). The findings suggest that higher levels of knowledge of phlebitis were associated with greater motivation to engage in phlebitis prevention.

Table 4. Relationship between Phlebitis Knowledge and Motivation for Phlebitis Prevention of Professional Nursing Students (n=176)

Knowledge	Motivation				Total		Correlation Coefficient*	Sig.(2-Tailed)*
	High		Low					
	n	%	n	%	n	%		
Good	4	2.3	0	0	4	2.3	0.423	<.001
Moderate	72	40.9	0	0	72	40.9		
Poor	66	66	34	34	100	56.8		

DISCUSSION

Study findings indicated that the majority of nursing students had a poor level of knowledge regarding phlebitis. Although studies specifically assessing knowledge of phlebitis remain limited, a considerable number of studies have investigated knowledge related to peripheral intravenous catheter (PIVC) management. Since phlebitis is one of the most common complications associated with PIVC use (Kaphan et al., 2024), these findings may reflect a similar gap in knowledge of PIVC management and its related complications.

The findings of this study are consistent with previous studies conducted among nursing students in Ethiopia, Italy, and Nepal, which reported deficient knowledge regarding peripheral intravenous catheter (PIVC) management (Etafa et al., 2020; Sharma et al., 2022; Simonetti et al., 2019). However, these findings contrast with those of Hernon et al., (2024), who reported that although nursing students demonstrated limited knowledge of venipuncture and PIVC insertion skills, phlebitis was the complication most commonly understood by the students. In contrast, studies conducted among professional nurses in Ethiopia, Malaysia, Pakistan, and China have generally reported adequate knowledge of PIVC management (Dessalegn et al., 2024; Nordin et al., 2023; Qamar et al., 2017; Xu et al., 2020). This difference highlights a gap in knowledge between nursing students and practicing nurses, suggesting that competence in PIVC management may improve as individuals transition from academic training to professional clinical practice. Given that peripheral intravenous catheters are widely used in clinical settings and that phlebitis remains one of the most common catheter-related complications (Kaphan et al., 2024), adequate knowledge among nursing students and nurses is essential for preventing complications, reducing patient morbidity, shortening hospital stays, and minimizing healthcare costs (Simonetti et al., 2019).

The poor level of knowledge observed in this study may reflect insufficient reinforcement of phlebitis-related theoretical content during nursing education. Phlebitis is often addressed as a component of intravenous therapy and patient safety rather than as a distinct topic of study. Furthermore, nursing students may have limited opportunities to encounter and manage phlebitis cases directly during clinical placements, particularly when exposure to intravenous therapy complications is infrequent. This situation may be further compounded when laboratory training or simulation sessions related to intravenous catheter insertion and maintenance are not conducted regularly, leading to limited understanding of complications such as phlebitis. Previous evidence has shown that greater participation in training activities is associated with higher levels of knowledge acquisition (Ahlin et al., 2017).

The findings may also be supported by the characteristics of the Indonesian nursing professional curriculum. During the professional stage, learning activities are predominantly conducted in clinical settings, where students are expected to integrate and apply the theoretical knowledge acquired during the academic phase to direct patient care. Although clinical exposure is essential for developing practical competencies, the emphasis on practice-based learning may reduce opportunities for the structured reinforcement of specific theoretical concepts, including phlebitis prevention and management. Consequently, gaps in students' understanding of phlebitis may persist despite ongoing clinical training. This finding is consistent with the concept of the knowledge–practice gap in nursing education, whereby theoretical knowledge is not always effectively integrated into clinical practice (Gassas, 2021). Therefore, greater emphasis should be placed on phlebitis-related content within the curriculum. Simulation-based learning, regular skills training, and structured clinical experiences supported by preceptors may help strengthen students' knowledge and facilitate the integration of theory into practice (Etafa et al., 2020).

Despite the poor level of knowledge observed among participants, motivation toward phlebitis prevention was generally high. This finding suggests that motivation may be influenced by factors beyond knowledge acquisition alone. Nursing students, particularly those in the professional stage, are trained to implement patient safety principles and infection prevention practices throughout both their academic and clinical education (Amavasi & Zimmerman, 2024). As phlebitis is widely recognized as a preventable complication of intravenous therapy, students may perceive its prevention as an important aspect of patient safety and quality of care (Guanche-Sicilia et al., 2021; Nickel, 2019; Oliveira et al., 2019). Continuous exposure to patient safety standards and professional responsibilities during clinical training may foster a strong commitment to preventing avoidable complications. In addition, a high level of intrinsic motivation to become active learners may be reflected in nursing students' adherence to clinical standards, guidelines, and evidence-based practices (Gassas, 2021). Consequently, students may demonstrate high motivation toward phlebitis prevention even when their specific knowledge regarding phlebitis remains limited.

This study identified a moderate positive relationship between knowledge of phlebitis and motivation for phlebitis prevention among professional nursing students, suggesting that students with greater knowledge of phlebitis tend to demonstrate higher motivation to engage in phlebitis prevention. In other words, greater knowledge of phlebitis can enhance motivation to prevent it. However, a discrepancy was observed: most participants demonstrated poor knowledge of phlebitis but exhibited high motivation to engage in preventive measures. This condition may be attributed to concerns about negative consequences, such as the risk of infection or reprimands from supervisors, which drive students' motivation to prevent phlebitis despite an incomplete understanding of the condition (Alhazimi et al., 2022).

Motivation is a key determinant of educational achievement, positively associated with learning outcomes, and plays a crucial role in facilitating academic success (Rafii et al., 2019). Motivation is essential for nursing students, as it encourages continuous learning and the development of knowledge and competencies required to deliver high-quality nursing care (Rose, 2011). Students with strong intrinsic motivation are more likely to be driven to learn, achieve academic success, and actively engage in educational activities (Nilsson & Warrén Stomberg, 2008). These students often view education as an opportunity to satisfy their curiosity and are genuinely interested in acquiring new knowledge (Rafii et al., 2019).

This finding suggests that students with a better understanding of phlebitis risk factors, clinical manifestations, complications, and evidence-based prevention strategies are more likely to recognize the importance of preventive interventions and demonstrate greater motivation to implement them. This is supported by previous research findings, which also show that students better understand learning materials and demonstrate higher motivation, improved study strategies, and better performance when they are aware of the reasons for learning the material (Padilha et al., 2019; Singh et al., 2021). On the other hand, existing evidence has demonstrated that knowledge of intravenous therapy management is associated with improved adherence to best practices for preventing catheter-related complications, including phlebitis (Teixeira et al., 2025). Therefore, improving students' knowledge may represent an important strategy for strengthening their motivation and commitment to evidence-based phlebitis prevention, thereby enhancing the quality and safety of patient care.

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design only allows the identification of associations between phlebitis knowledge and prevention motivation at a single point in time and does not permit causal inferences. Second, the study was conducted within a single educational institution, which may limit the generalizability of the findings to nursing students in other academic or clinical settings with different characteristics, such as curriculum, educational facilities, or clinical experiences. Finally, this study focused exclusively on knowledge and motivation and did not examine other variables that may influence preventive behaviors. Future studies should employ multicenter designs and larger and more diverse samples to better understand the complex factors influencing motivation toward phlebitis prevention among nursing students.

CONCLUSION

This study found that professional nursing students had a poor level of knowledge regarding phlebitis despite demonstrating a high level of motivation for its prevention. This discrepancy suggests a gap between cognitive understanding and motivational aspects of learning outcomes. Although motivation was high, insufficient reinforcement of phlebitis-related theoretical content and limited structured training may have contributed to inadequate knowledge. Therefore, strengthening phlebitis education through enhanced theoretical integration, simulation-based learning, and structured clinical experiences supported by preceptorship is essential to improve students' preparedness for safe and evidence-based nursing practice.

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