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THE RELATIONSHIP BETWEEN FAMILY SUPPORT AND SELF-HARMING BEHAVIOR AMONG STUDENTS

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ABSTRACT

Background: Mental health problems among university students are increasing and may lead to maladaptive coping behaviors, including self-harm. Self-harm is defined as intentional self-injury without suicidal intent, commonly used as a means of regulating emotional distress. Family support is considered a key protective factor that can enhance emotional stability and reduce the risk of self-harm behavior.

Objective: This study aims to determine the relationship between family support and self-harming behavior in undergraduate nursing students at Muhammadiyah University of Surakarta

Method: This research was quantitative with a correlational method. The sample used was 114 students, using a simple random sampling method. Data were collected using a demographic questionnaire, the Family Support Scale (FSS) consisting of 20 items, and the Deliberate Self-Harm Inventory (DSHI) consisting of 16 items.

Results: A negative correlation is a relationship between two variables that move in opposite directions, where an increase in one variable is followed by a decrease in the other. In this study, a negative correlation indicates that the higher the family support received by students, the lower the tendency for self-harming behavior, and vice versa. The correlation coefficient value obtained from the Spearman test, r = -0.480, indicates a negative relationship with moderate strength.

Conclusion: This can be interpreted as meaning that there is a relationship between family support and self-harming behavior in undergraduate nursing students at Muhammadiyah University of Surakarta.

Keywords: Family Support, Mental Health, Nursing, Self-harm, Student

BACKGROUND

Adolescent mental health is a crucial indicator in assessing the quality of a nation. Adolescents who grow up in a supportive environment are considered valuable assets to the nation. Adolescence is a challenging and changing phase of identity discovery, making them vulnerable to mental health disorders (Lestari & Fuada, 2021). College students, as part of the adolescent group, are also not immune to mental health issues, such as mental stress, social pressure, and an unsupportive environment that can affect their psychology. These conditions can lead to anxiety, stress, fear, and even self-harm (Suwijik & A'yun, 2022).

Mental health disorders in Indonesia have a prevalence of around 9.8% of people aged 15-24 years (Suwijik & A'yun, 2022) In Central Java, the rate of mental disorders ranges from 9% to 9.8%, indicating a significant mental burden in the region. Meanwhile, in Solo City, mental disorders were reported at 1,431 people (Sihotang, 2020). The high prevalence of mental health disorders in adolescents indicates the need for special attention and treatment to prevent mental health problems from increasing and to support the creation of a young generation that is psychologically and socially healthy (Lestari & Fuada, 2021).

Wrong One mental health disorder is self-harm behavior, which is an act of intentionally injuring oneself to relieve stress or emotions (Aulia et al., 2023). This behavior is often done as an escape from inner pain and disappointment. Although this behavior is not intended to end one's life, self-harm requires special attention for its treatment (Kalangi P et al., 2024). Forms of self-harm behavior are not only scratching one's own skin, but there are other types such as burning the body, making wounds, hitting oneself, pulling out hair, and swallowing dangerous substances (Apsari, 2021).

Family support is an effective way to address self-harm behavior in college students. With family support, students will feel more appreciated, accepted, and loved by their families, which will positively impact their mental health (Makarim, 2021). One of the family's functions is nurturing, which involves meeting the care and maintenance needs of family members to maintain their health. This care encompasses physical, spiritual, social, and emotional health, ensuring that each family member can grow and develop optimally (Widodo et al., 2024). Parental involvement in maintaining adolescent mental health includes building strong emotional bonds and creating an open environment for communication, so that children do not hold back or bottle up their problems (Saba, 2024). Families also need to be companions and friends to their children, not just givers of advice and unrealistic solutions. Therefore, parents are the primary factor influencing every aspect of a child's life (Ningrum, 2023).

Yuliana's (2020) research explains that the family environment plays a role in determining a child's upbringing and development. This is crucial in shaping a child's character and preventing mental health issues during adolescence. Therefore, parents must be responsible for their child's parenting, providing everything they need, not just advice but also acting as a friend with whom their child can share their stories and express their concerns, thus maintaining their mental health.

Another study by Lestari explains that adolescents who come from families with good family function tend to have a lower risk of self-harm compared to those who come from families with poor family function. Interventions to reduce self-harm behavior in adolescents must consider family aspects for example, programs to strengthen family function, involve

parents, build healthy family communication, equip parents to recognize risk signs and provide emotional support.

This research is important because self-harm is a form of mental health disorder that is increasingly prevalent among adolescents and college students. This phenomenon indicates a crisis in individuals' ability to manage emotions and psychological stress, which, if left untreated, can progress to more severe mental disorders and even increase the risk of suicide.

This study aims to determine the relationship between family support and self-harming behavior in undergraduate nursing students at Muhammadiyah University of Surakarta.

OBJECTIVE

This study aims to determine the relationship between family support and self-harming behavior in undergraduate nursing students at Muhammadiyah University of Surakarta

METHODS

Study Design

This research is quantitative using the correlation method. Correlation research aims to examine the relationship between variables in the same direction (positive correlation) or in different directions (negative correlation).(Ishak, 2023).This study uses a cross-sectional design, namely data collection is only carried out once at the same time.

Setting

This research was conducted in August – November 2025. The population used was nursing students of Muhammadiyah University of Surakarta Class of 2022.

Research Subjects

The population used in this study were nursing students of Muhammadiyah University of Surakarta, Class of 2022. The sampling technique used was simple random sampling. The number of respondents was determined using the Slovin formula with a 10% margin of error, resulting in a total of 114 respondents. Inclusion criteria in this study included nursing students who were actively studying in their 7th semester, students who had thoughts of self-harm, and students who were willing to be respondents. Meanwhile, exclusion criteria included students undergoing psychiatric therapy.

Instrument

Data collection was conducted using a questionnaire comprising respondents' demographic data, a 20-item Family Support Scale (FSS) questionnaire to measure family support, and a 16-item Deliberate Self-Harm Inventory (DSHI) questionnaire to assess self-harm behavior.

Data analysis

Data analysis was carried out using univariate and bivariate analysis with the Spearman rank test.

Validity and Reliability/ Trustworthiness

The results of the PSS-Fa (Perceived Social Support Family Scale) questionnaire validity test were carried out on 20 statement items which had a calculated r value > r table (0.361) and the reliability test showed a Cronbach alpha of 0.752.(Mardiyah et al., 2019).The Deliberate Self-Harm Inventory (DSHI) questionnaire with a total of 16 questions, using a construct validity test, the results of the CFA test with a one-factor model did not produce a fit model with Chi Square = 229.59, df = 104, P-value = 0.00000, RMSEA = 0.078. After modifications to the model, a fit model was obtained with Chi-Square 120.82, df = 97, P-value = 0.05110, RMSEA = 0.035 (Sugianto, 2020).

Ethical Considerations

This research has received ethical approval from the research ethics committee of the Faculty of Medicine, Muhammadiyah University of Surakarta with ethics number N0. 5928/B.1/KEPK-FKUMS/X/2025

RESULTS

Table 1. Respondent Characteristics (n= 114)

Indicator	Frequency	Presentation
1. Gender		
Man	29	25.4%
Woman	85	74.6%
Total	**114**	**100%**
2. Age		
20	27	23.7%
21	61	53.5%
22	26	22.8%
Total	**114**	**100%**
3. Closest Family		
Father	9	7.9%
Mother	80	70.2%
Older brother	23	20.2%
Younger brother	2	1.8%
Total	**114**	**100%**

The subjects who were respondents in this study were 29 men with a percentage of (25.4%) and 85 women with a percentage of (74.6%).

Based on the age category table for students in this study, it is known that of the 114 respondents sampled, there were 27 people aged 20 years (23.7%). There were 61 people aged 21 years (53.5%). Then there were 26 people aged 22 years (22.8%). From this data, it can be

seen that the frequency distribution of the majority of respondents was aged 21 years, with a total of 61 people.

Based on the family distribution table of 114 respondents, it is known that 9 people (7.9%) are close to their fathers. 80 people (70.2%) are close to their mothers. 23 people (20.2%) are close to their older siblings. Then, 2 people (1.8%) are close to their younger siblings. The data above shows that the majority of respondents are close to their mothers, which is 80 people.

Table 2 Distribution of Family Support and Self Harm Behavior

No	Variables	Category	Frequency	Presentation
1	Family support	Not enough	20	17.5%
		Enough	30	26.3%
		Good	64	56.1%
2	Self-Harm	No self harm	70	61.4%
		Mild Self Harm	31	27.2%
		Psychopathological tendencies	13	11.4%

The table shows the frequency distribution of family support among 114 students from the 2022 intake, with 64 respondents categorized as "good," with a percentage of 56.1%. The table also presents three categories: "insufficient," "sufficient," and "good." The "insufficient" category indicates that respondents have low levels of family support. The "sufficient" category indicates that respondents receive adequate levels of family support. Meanwhile, the "good" category indicates that respondents receive optimal family support. Thirty respondents (26.3%) reported having sufficient support. Twenty respondents (17.5%) reported having insufficient support. These data indicate that the majority of respondents have good family support.

The table above shows the frequency distribution of self-harm among 114 students from the 2022 intake. In this category, 70 (61.4%) did not engage in self-harm. Furthermore, 31 (27.2%) engaged in mild self-harm. Thirteen (11.4%) had psychopathological tendencies. These data indicate that the majority of respondents did not engage in self-harm

Table 3. Relationship between Family Support and Self-Harm Behavior Among Students

Family Support	Self-Harm						Total %	P-value	r
	No Self Harm	%	*Self-Harm* Light	%	Psychopathological tendencies	%			
Good	57	50.0%	7	6.1%	0	0%	64 56.1%		
Enough	7	6.1%	22	19.3%	1	0.9%	30 26.3%	0.001	-0.480
not enough	6	5.3%	2	1.8%	12	10.5%	20 17.6%		
Total	70	61.4%	31	27.2%	13	11.4%	114 100%		

Based on the results of the normality test on the numerical data, it was not normally distributed. The value of family support in students was obtained (p = 0.001) and the value of Self-Harm in students was obtained (p = 0.001). Therefore, to analyze it, a Spearman Rank correlation test was carried out which is useful to determine whether there is a relationship between family support and Self-Harm in students. The results of the Spearman Rank test using a significance of 5% obtained a p value <0.001 which indicates (p <0.05), which can be interpreted as there is a relationship between family support and Self-Harm behavior in students. The correlation value r was obtained (-0.480) which indicates a moderate negative correlation between family support and Self-Harm behavior.

DISCUSSION

Family Support

Family support is a form of interpersonal relationship involving attention, affection, and assistance that can provide emotional comfort and a sense of appreciation for family members in need. This support includes encouragement to adapt, building self-confidence, and reducing psychological distress.

The family support table shows that the majority of respondents have good family support, with a total of 64 (56.1%) out of 114 respondents. This result is in line with Haryanto's (2025) research entitled "The Relationship Between Family Support and the Intensity of Suicidal Behavior in Students." This study used a quantitative approach with a survey method with 60 students as respondents, which obtained results of 85.2% of respondents having full support from their families. This study explains that individuals who need support from their families have poor relationships with others. Therefore, family support is very much needed by students when they are in the phase of forming a new personality and who need prayers from their families so that they can carry out their duties and obligations as students.(Haryanto, 2025).

A study conducted by Wardana (2022) titled "The Relationship between Family Support and the Relapse Rate of Clients at Risk of Violent Behavior." This correlational study involved 40 respondents, with 17 respondents reporting high levels of social support (42.5%). This study explains that family social support provides reinforcement for better health functioning (Wardana et al., 2020).

Self-harm behavior

Self-harm is the act of intentionally injuring oneself without any intention of ending one's life, which is usually done as a way to deal with emotional distress, psychological pain, or stress that cannot be expressed verbally.

The Self-Harm table shows that the majority of 70 (61.4%) respondents did not engage in self-harm behavior. This finding aligns with Nurliana Saraswati's (2024) research entitled "The Relationship Between Depression Levels and Self-Harm Behavior in Adolescents." The study found that 71 (50.0%) of the 142 respondents did not engage in self-harm behavior. These results indicate that not all adolescents experiencing problems express their emotions through self-harm behavior. Family or social support is thought to improve adolescents' ability to manage their emotions.(Saraswati et al., 2024)

The relationship between family support and self-harm behavior among students

Based on the results of the bivariate analysis of the relationship between family support and self-harm behavior among students using the Spearman rank test, it shows a p value <0.001 with a correlation value of (-0.480). The direction of support is negative, meaning that the higher the family social support, the lower the self-harm behavior. Social support is a pleasure felt by individuals for the appreciation of someone's care and help. Family social support can play a role in maintaining adolescent emotional stability so that it will minimize the occurrence of maladaptive coping mechanisms caused by adolescents' failure to adapt to a problem.

This research is in line with the research conducted by Lonika 2025 entitled "The Relationship between Social Support and Non-Suicidal Self-Injury Behavior in Adolescents in Jakarta" this research shows that the higher the level of social support a person gets, the lower the possibility of non-suicidal self-injury behavior. The results of the hypothesis test obtained a correlation coefficient value of -0.342 with a significance of 0.001 which means that there is a relationship between social support and non-suicidal self-injury behavior (NSSI) in adolescents in Jakarta (Lonika et al., 2025).

Another study by Adam entitled "The Relationship Between Family Functioning with Self-Injury Behavior towards Young Adults" showed that the correlation coefficient showed r = -0.96 with a p value of 0.000 (Sig. <0.05) so it can be concluded that the hypothesis proposed by the researcher is accepted, namely there is a significant negative relationship between family functioning and self-injury in adolescents. These results indicate that the higher the family functioning, the lower the self-injury in adolescents. Conversely, if family functioning is low, self-injury is higher. (Adam & Nastiti, 2023).

Based on the discussion above, it can be concluded that there is a relationship between family support and self-harm behavior among students. This is proven by the results of the Spearman rank statistical test which shows a p-value <0.0001. The level of negative correlation coefficient with the results of r (-0.480) which means that there is a moderate correlation between family support and self-harm behavior among students. This means that the higher the family support, the lower the self-harm behavior among students.

CONCLUSION

Family support for self-harm behavior in nursing students, the majority of students have sufficient family support, this family support is very necessary and very meaningful for the physical and psychological health of students, considering that students have a lot of pressure in terms of assignments from campus, peer pressure, and loneliness. This directly affects how students cope in living their lives. The majority of students do not engage in self-harm behavior, this strengthens the evidence that students can minimize behavior that hurts themselves so it can be concluded that they have good coping mechanisms. The results of the study showed a relationship between family support and self-harm behavior among students with a correlation coefficient value of p <0.0001 and a correlation of r = -0.480. This shows that the higher the family support, the lower the self-harm behavior among students.

This research is expected to encourage student respondents to refrain from self-harm when facing family problems and to seek support from friends and others. It is also hoped that this research will provide scientific and practical contributions to the fields of nursing, psychology, and education, particularly in efforts to prevent self-harm behavior by enhancing the role and support of families. The research findings can also serve as a basis for health professionals, counselors, and educational institutions to develop family intervention programs to strengthen the mental resilience of adolescents and students.

The findings of this study indicate that family support plays a significant role in reducing self-harm behavior among undergraduate nursing students. The moderate negative correlation found suggests that family support functions as an important protective factor in maintaining students' mental health. These results strengthen existing theories in mental health nursing and psychology that emphasize the role of the family as a primary support system in helping individuals manage emotional distress and adopt adaptive coping mechanisms.

Practically, this study implies that mental health promotion and self-harm prevention programs for students should involve family-based approaches. Nurses, counselors, and educational institutions are encouraged to incorporate family support assessments and interventions into student mental health services. Strengthening family communication and emotional support may help reduce the risk of self-harm behavior and improve students' psychological well-being.

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CONFLICTS OF INTEREST

There's no problem with the research

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ANALYSIS OF OCCUPATIONAL SAFETY AND HEALTH RISK MANAGEMENT IN METAL INDUSTRY PRODUCTION AREAS USING THE HIRA METHOD

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ABSTRACT

Background : The informal metal industry poses a high risk of hazards but often escapes oversight of Occupational Safety and Health (K3) standards. The lack of systematic risk management in these environments exposes workers to a variety of hazards, ranging from ergonomic, mechanical, physical, and chemical, all of which can potentially lead to accidents and occupational illnesses.

Objective: The purpose of the research is to identify potential hazards, assess the level of risk in each production area, and formulate effective control alternatives to minimize work incidents.

Methods: The research method used was descriptive quantitative with the Hazard Identification and Risk Assessment (HIRA) approach. This approach was used to analyze all activities in nine production areas through the stages of hazard identification, likelihood and severity assessment, and risk level determination. Data was collected through direct observation and worker interviews, and validated using secondary data from Job Safety Analysis (JSA) and previous incident reports.

Results: The research results showed that there were 11 findings of high hazard risks, 11 moderate hazard risks and 7 low hazard risks in all production areas.

Conclusion: It can be concluded that the application of the HIRA method is essential for risk management in the informal metal industry. It is recommended to implement hierarchical controls, ranging from engineering controls such as the installation of machine guards and ventilation systems, to administrative controls such as the development of stricter SOPs and regular OHS training.

Keywords: Metal Industry, Occupational Safety and Health, Risk Management

BACKGROUND

Human resources (HR) are a fundamental asset and a key pillar in accelerating economic development and a country's competitiveness on the global stage. The quality and productivity of HR directly determine the innovation capacity and efficiency of national industry. Protecting HR is no longer merely a normative obligation, but rather a crucial strategic investment to ensure sustainable productivity. Without guaranteed safety and health protection, HR's full potential will never be achieved and they even risk becoming a demographic burden due to high rates of work-related disability and death.

The development paradigm focused on human resources faces significant challenges in developing countries like Indonesia, where the economic structure is dominated by the informal sector. The latest data from the Central Statistics Agency (BPS) as of February 2025 shows that 59.7% of the total national workforce is absorbed in this sector. The informal sector, which includes micro, small, and independent businesses, operates within a regulatory "grey zone" characterized by the absence of formal employment contracts, minimal access to social security, and, most worryingly, a near-inability to comply with Occupational Safety and Health (OSH) supervision and standards.

Occupational Safety and Health (OSH) is a multidimensional discipline and application aimed at protecting workers from all potential risks, preventing workplace accidents, and minimizing occupational diseases, in order to create a safe, healthy, and productive work environment. The absence of a structured Occupational Safety and Health culture and system in the informal sector directly exposes millions of workers to uncontrolled hazards. This contrasts with the formal sector, which is bound by strict regulations such as Government Regulation No. According to Law No. 50 of 2012 concerning the Occupational Health and Safety Management System (SMK3), informal industry workers often work with rudimentary equipment, without adequate personal protective equipment (PPE), and in non-ergonomic work environments. Consequently, the prevalence of workplace accidents and occupational diseases (PAK) is not accurately recorded but is estimated to be very high. This phenomenon represents the "tip of the iceberg" in national labor statistics, where reported figures are only the tip of a much more massive and systemic problem at the lower levels of the economy.

The impact of this negligence in Occupational Health and Safety is extremely worrying. A joint report by the World Health Organization (WHO) and the International Labour Organization (ILO) in July 2025 estimated that more than 2.8 million worker deaths globally each year are caused by work-related accidents and diseases, with the largest contribution coming from the informal sector in lower-middle-income countries. Data from the Social Security Agency (BPJS Ketenagakerjaan) through the second quarter of 2025 does show tens of thousands of reported workplace accidents, but this figure only reflects registered workers in the formal sector. Experts project that the real number of incidents in the informal sector could be 10 to 15 times higher than the official data, making it a hidden humanitarian and economic crisis.

To reduce or eliminate hazards that can cause workplace accidents, risk management is required, encompassing hazard identification, potential hazard analysis, risk assessment, risk control, and monitoring and evaluation. The process of identifying and analyzing potential hazards can be conducted using the Hazard Identification and Risk Assessment (HIRA)

method. HIRA aims to identify potential hazards in the workplace by linking workers, tasks, work equipment, and the work environment (Agnella and Utami, 2021).

While HIRA has proven highly effective and is the main foundation of Occupational Safety and Health Management Systems in formal industries, its implementation in the informal sector remains a significant challenge and an underexplored area of research. One workplace with several potential hazards is the metal industry. In metal industry installations, services include plate cutting and engineering, bordering/flat plate, plate punching, lathing, welding, and plate rolling services. Furthermore, numerous mechanical machines are used to provide engineering services that are inherently dangerous, hot, and sharp. Consequently, risk management for occupational safety and health is crucial. Therefore, the research entitled "Analysis of Occupational Safety and Health Risk Management for Industrial Workers in the Metal Industry. Using the HIRA Method" is very essential and urgent. This research aims to identify and analyze specifically the potential hazards and risks faced by industrial workers in the informal sector, especially in the metal industry, and formulate a practical and applicable application of the HIRA method according to the unique characteristics of the sector, as a concrete step to protect the nation's most vulnerable Human Resources assets.

OBJECTIVE

The Objective from this research is to determine the application of Hazard Identification and Risk Assessment (HIRA) in an effort to reduce potential hazards in the workplace in the Metal Industry.

METHODS

The research was conducted using a qualitative descriptive approach. The study was conducted in the production area of the Metal Industry in Sidoarjo Regency. The study was conducted from August to September 2025. This study analyzed the risk of occupational accidents using the HIRA method, which is the process of identifying hazards that occur in all company activities, then conducting a risk assessment of these hazards and providing control recommendations.

Occupational risk analysis can be viewed through two aspects: probability and severity (ILO, 2018). The assessment process includes the level of likelihood. The level of likelihood of an accident or occupational illness must consider how often and for how long a worker is exposed to the potential hazard. This allows for a decision about the frequency of accidents for each identified potential hazard. The next step is the severity. Determining the severity of an accident also requires considering how many people are affected by the accident and which parts of the body are exposed to the potential hazard.

RESULTS

In the Sidoarjo metal industry, hazard identification analysis is carried out on the production process which consists of several stages/areas starting from raw material storage, cutting, pressing, punching, welding, finishing, plating, packaging and product loading. During the processing process, machines are operated, except for raw material storage. Based on the

results of observations and interviews, the identification and assessment of risks/hazards at PT. X are presented in Table 1.

Table 1. Hazard Identification and Risk Assessment (HIRA) Results

Process	Hazard	Consequence	P	S	R	Control
Procurement of iron stock	Ergonomic hazards when lifting manually (heavy metal loads can cause aches and pains in workers)	Low back pain, bruises, broken bones	3	3	*Medium (9)*	Using lifting equipment (trolley/forklift), wearing PPE (safety shoes, gloves)
	Placing raw materials in a high position	Tripping and being hit by a foot can result in bruises, broken bones, scratches	2	3	*Medium (6)*	
	The storage area is too narrow so that workers' activities are slightly disturbed due to limited movement.	workers being trapped	1	2	*Low(2)*	
Iron cutting	Being hit by a cutting machine because the machine does not have a safety device, which can cause worker injury.	Causes the risk of cuts and being hit by metal fragments, eye irritation, hearing loss so that workers can operate the tool not in accordance with procedures.	3	4	*High (12)*	Wearing PPE (safety glasses, gloves, earplugs), installing machine guards, Work SOP's
	Absence of machine operating procedures	Causing injury to workers	1	1	*Low (1)*	
	Iron pieces placed below pose a risk for workers to trip over them	Causes minor injuries	2	2	*Low (4)*	

Process	Hazard	Consequence	P	S	R	Control
Iron formation	Hand or finger caught in press/mold machine	Crush wounds, bruises, amputations	2	5	*High* (10)	Use of a two-hand control system, wear PPE (gloves), work SOP
	Iron pieces placed below pose a risk for workers to trip over them	Causes minor injuries	2	2	*Low* (4)	
	Dark areas, poor lighting, and poor air circulation	Possibility of causing injury	2	2	*Low* (4)	
	Inadequate electrical installation	Causes risk of electric shock	2	2	*Low* (4)	
Iron punching/hole punching	Hands trapped, sharp metal fragments hit the body	Puncture wounds, scratches, eye irritation	3	3	*Medium* (9)	Wear PPE (safety glasses, gloves), use a brush/magnet to clean debris.
	Small scratches or wounds	May cause disruption in job performance	2	2	*Low* (4)	
	Oil spills on the floor of the punch machine area	Decrease in safety performance index leading to an increase in the frequency of work accidents	3	3	*Medium* (9)	
Iron welding	Exposure to welding rays (UV/IR), welding fumes, electric shock, and sparks	Arc eye, respiratory problems, burns, fire, fatal electric shock	4	3	*High* (12)	Use PPE (welding mask, leather gloves, apron), adequate ventilation (exhaust fan), provide APAR.
	Extreme heat and molten metal splashes	Direct burns to the skin or eyes	3	3	*Medium* (9)	
	Dust spray during the welding process	Long-term inhalation and worsening of respiratory conditions	4	4	*High* (16)	

Process	Hazard	Consequence	P	S	R	Control
Iron polishing	Noise, vibration, contact with grinding stone	hearing loss, hand-arm vibration syndrome (HAVS), lacerations/abrasions	4	4	*High* (16)	Wearing PPE (N95 mask, safety glasses, ear plugs/muffs, gloves), having a dust collector.
	Hot metal flakes	Eye injuries, skin burns, and cuts	3	3	*Medium* (9)	
	Iron dust particles flying	Respiratory disorders and eye irritation	3	3	*Medium* (9)	
Chrome coloring/coating	Exposure to vapors and splashes of hazardous chemicals (acids, chrome solutions)	Skin & eye irritation, poisoning, respiratory disorders, environmental pollution	3	4	*High* (12)	Wear complete PPE (respirator, goggles, chemical gloves, apron, boots), ventilation (fume hood), MSDS available .
	Metal exposure during the plating process	Long-term inhalation	3	3	*Medium* (9)	
Packaging	Repetitive movements, non-ergonomic working postures, sharp edges on products/packaging	Muscle and joint pain (MSDs), lacerations	3	2	*Medium* (6)	Using complete PPE, ergonomic work station design .
	Lifting or moving heavy spare parts boxes	Back injury, muscle strain, or musculoskeletal disorder	3	3	*Medium* (9)	
	Exposure to metal dust or residue from the powder coating/chroming process that sticks to the product or chemicals on the packaging	Skin/eye irritation, respiratory problems, or poisoning	4	4	*High* (16)	
Delivery	Manually lifting	Back injury, crush	3	3	*Medium*	Using a trolley,

Process	Hazard	Consequence	P	S	R	Control
	heavy loads, items falling during loading, traffic accidents	injury, asset damage, fatal injury			*m* (9)	ensuring the load is securely tied, checking the vehicle before leaving.
	Collisions between forklifts and pedestrians, failure of the transport equipment brakes, or load instability	Serious injuries such as broken bones, internal injuries	4	4	*High* (16)	
	Unstable stacking of goods on warehouse shelves or during loading into containers/trucks, especially if spare parts are packed in large boxes without strong fasteners.	Head injuries, bruises, or crushing caused by falling cargo and product damage	4	4	*High* (16)	Use proper and strong binding tools and transport tools that are appropriate to the capacity.
	Workers may be exposed to chemical residues from the production process.	Skin irritation, respiratory problems, or chronic poisoning	4	4	*High* (16)	Use PPE in accordance with SOP
	The presence of flammable materials such as oil or plastic packaging in the delivery area	Burns, smoke asphyxiation, or fatal damage in the warehouse area	4	4	*High* (16)	

Based on the results of hazard identification and risk assessment using the Hazard Identification and Risk Assessment (HIRA) method in the metal industry production process in Sidoarjo Regency, various potential hazards were identified, with varying levels of risk from low to high, across all work stages. Based on the HIRA Table 1, the risk values for each production process vary from low (R=1–4), moderate (R=6–9), to high-extreme (R≥10).

Low to moderate risks were generally found in the procurement and storage of raw materials, which were dominated by ergonomic hazards and tripping risks. Meanwhile, high risks were often found in the cutting, forming, punching, welding, grinding, chemical coating, and product distribution processes. The main hazards included mechanical injury, exposure to noise, metal dust and fumes, hazardous chemicals, and the risk of accidents resulting from lifting and transporting activities and the use of heavy equipment.

Welding, grinding, and chrome plating processes exhibited the highest levels of risk, particularly related to exposure to fumes, metal dust, extreme heat, and chemicals, which have the potential to cause respiratory problems, serious injuries, and even poisoning. Although some controls have been implemented through the use of personal protective equipment, work procedures, and ventilation, comprehensive risk control is still needed to reduce the risk of accidents and occupational diseases.
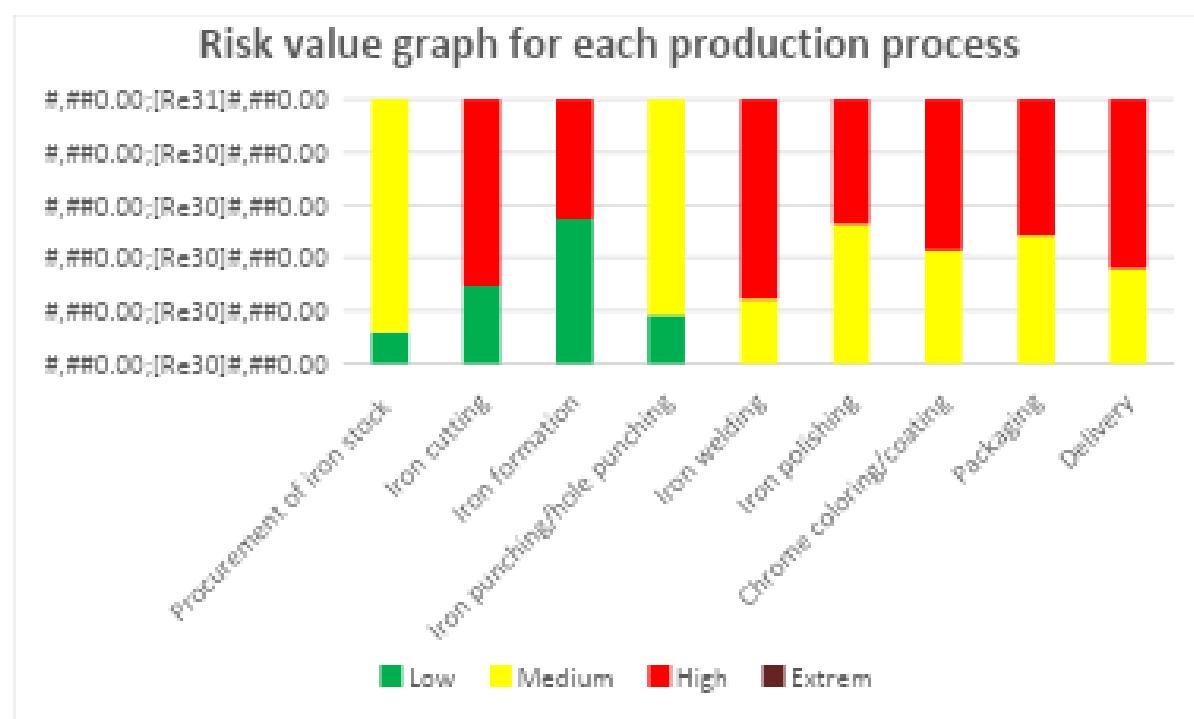
Figure 1. Risk value graph for each production process

Based on Figure 1, the graph shows the number of risk findings in each production process, categorized as low, medium, high, and extreme. The process with the highest number of risks is the loading/distribution area (5 findings), which is dominated by high to extreme risk findings (R=16–20). Next, the welding and cutting machine areas each have 4 risk findings, with a predominance of high risks (R=12–16). In the press and punching machines, 3–4 risk findings were found in the medium to high category (R=9–10). Meanwhile, raw material storage, finishing/grinding, coating, and packaging activities have fewer risks, which are generally in the low to medium category (R=2–9). These findings indicate that the loading/distribution, welding, and cutting machine processes are the main priorities in risk control.

DISCUSSION

After collecting and processing data regarding risk findings in the production process at metal industry and its risk levels, there are 11 risk findings that fall into the highest (high) category, 11 risk findings that fall into the medium category, and 7 risk findings that fall into the lowest (low) category. The following is a further explanation.

Low Risk Findings and Risk Assessment

Based on the research results, seven low-risk risks were identified, namely in the raw material transportation, metal cutting, pressing, and punching processes. Low-risk hazards include being crushed due to limited space, which limits activity during the raw material transportation process; the risk of cuts during the metal cutting process; the risk of workers tripping; inadequate lighting and air circulation during the pressing process; and injuries during the punching process. Control measures include administrative controls and personal protective equipment (PPE). Control over the raw material transportation process can be achieved by implementing the 5S (5S) in the raw material storage process, making it easier for workers to select and transport materials (Rantung, *et al*, 2018). The 5S (Seiri, Seiton, Seiso, Seketsu, Shitsuke) method is an effective method for warehouse management (Qowim et al., 2020). Control over the risk of cuts can be achieved through engineering techniques, including the use of safe and comfortable hand tools; administrative controls include providing training and education on the hazards and impacts of using these tools; and providing operational procedures. Personal protective equipment (PPE) controls can be implemented to prevent worker exposure to hazards by using gloves and safety shoes to prevent cuts and abrasions from work tools on the hands and feet while working (Saputra and Widodo, 2023)

Moderate Risk Findings and Risk Assessment

Based on the research results, 11 risks were identified as moderate, including those encountered in the raw material transportation, punching, welding, finishing, plating, packing, and loading processes. Moderate risks include ergonomic hazards during raw material transportation, hands being trapped during the punching process, exposure to extreme heat, metal chips during the welding process, heat and fine iron dust particles, and molten metal splashes during the finishing process, metal exposure during the plating process, repetitive movements and non-ergonomic work postures during the packing process, and the risk of being crushed during the loading process. Based on these findings, control measures are necessary. One control measure that has been implemented is providing personal protective equipment such as gloves and safety shoes. Although the hazard is considered moderate, in-depth control is still necessary, considering the frequency of occurrence. Other possible controls include administrative controls for the potential hazards of inhaling dust, including providing training and education on the hazards and impacts of inhaling dust. This is intended to help workers recognize the hazards early and change bad habits into good ones. This emphasizes the mental attitude of workers. Risk control for potential noise hazards can be achieved by rotating and scheduling work based on exposure dose calculations according to threshold values, as well as conducting initial, periodic, and specific health checks. If administrative controls are not feasible, the use of PPE in the form of earplugs is mandatory for workers in areas with high noise levels. This is consistent with Martino et al., who stated that risk control for potential noise hazards cannot be achieved using elimination controls, substitution controls, and

engineering controls because they can impact and disrupt the production process. Therefore, administrative controls and the use of PPE are essential.

High Risk Findings and Risk Assessment

Based on the research results, 11 high-risk findings were identified, including those in the cutting, pressing, welding, finishing, plating, packing, and loading processes. High-risk hazards include injury risks such as fingers being cut during the cutting process, hands being caught in the machine during the pressing process, exposure to noise and vibration during the finishing process, exposure to hazardous chemical splashes (acid, chrome solution) in the plating area, exposure to metal dust or residue from the powder coating/chroming process in the packing area, the risk of load instability during the loading process, failure of the conveyor brakes and load instability during the loading process. The highest risk finding was exposure to UV light, sparks, and material debris during the welding process, which can cause visual impairment, skin burns, and even fires. This is consistent with research by Saputra and Widodo (2023), which stated that these activities have a high risk because they can cause burns and blisters. Sparks originate from the combustion of liquids, which workers may come into contact with during pouring. Based on the highest risk findings, control measures can be implemented by ensuring that employees in the smelting area wear masks and comply with work instructions. Signs are installed in hazardous areas, specifically the smelting machine. Current control measures include administrative controls, which include regular checks of work equipment and procedures, and PPE usage controls to ensure the availability of protective PPE, including long-sleeved clothing, long pants, and heat-resistant gloves. Employees are also required to wear complete PPE.

CONCLUSION

Based on the research results, the conclusion is that there were 11 high-risk hazards, 11 moderate-risk hazards, and 7 low-risk hazards. Based on this, controls that can be implemented to mitigate workplace hazards include engineering controls, administrative controls, and the use of PPE. Engineering controls are a top priority. Recommendations include installing machine guards in cutting and pressing areas, installing local ventilation systems (exhaust fans) in welding and plating areas, and installing safety sensors on press machines. Administrative controls require the development of stricter Standard Operating Procedures (SOPs), job rotations to reduce monotonous exposure, and regular OHS training for all workers. Furthermore, controls on the use of Personal Protective Equipment (PPE) should be implemented by ensuring the availability and consistently enforcing the use of appropriate PPE, such as welding masks, respirators, cut-resistant and chemical-resistant gloves, and ear protection.

CONFLICTS OF INTEREST
There were no obstacles in implementing the research

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EMERGENCY NURSES' EXPERIENCES IN PERFORMING CARDIOPULMONARY RESUSCITATION IN CARDIAC ARREST PATIENTS: A LITERATURE REVIEW

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ABSTRACT

Background: Cardiopulmonary resuscitation (CPR) is the primary lifesaving measure for patients experiencing cardiac arrest, and emergency nurses play a central role in its implementation. Nurses' experience in performing CPR is a critical factor influencing resuscitation quality, clinical decision-making, and patient outcomes. Emergency Department nurses often experience stressful and emotional experiences when performing Cardiopulmonary Resuscitation (CPR) on patients with cardiac arrest, including the challenge of staying focused and working in a critical situation despite high pressure from time and patient condition, which has been explored in a qualitative study of nurses' experiences in direct cardiopulmonary resuscitation.

Purpose: This article aims to identify and analyze the experiences of emergency nurses in performing CPR on cardiac arrest patients based on a literature review of various recent studies.

Methods: This research is a secondary qualitative research with a systematic literature review design based on experience. Literature review search using Google Scholar electronic database, Science Direct published in 2020-2025 with search keywords emergency OR Emergency AND Nurse OR Nurse AND CPR OR CPR AND Cardiac Arrest OR Cardiac Arrest. Inclusion Criteria are Journals related to Emergency Nursing Experience &Journals discussing cardiopulmonary resuscitation. Data analysis involved critical appraisal, skimming, and scanning, separating irrelevant articles from relevant ones.

Results: There were 6 articles found that were in accordance with the topic, and through review, it was found that they showed that the literature review indicates that emergency nurses' experience in performing cardiopulmonary resuscitation (CPR) on cardiac arrest patients is influenced by a combination of technical skills, psychological preparedness, the work environment, and ongoing training.

Conclusion: Emergency nurse experience is a key element in the successful implementation of CPR on cardiac arrest patients. Strengthening the capacity of nurses through education, training, and work environment support is a strategic step to improve the quality of emergency services and patient safety. Emergency nurses' CPR experiences involve technical skills, emotional challenges, teamwork, and institutional support, influencing resuscitation quality and nurse well-being.

Keywords: Cardiopulmonary Resuscitation, Cardiac Arrest, Clinical Experience, Emergency Nurses

BACKGROUND

Cardiac arrest is an emergency requiring rapid and appropriate intervention to improve the patient's chances of survival. This chain of action, from recognition of cardiac arrest to providing high-quality chest compressions and early defibrillation, has been mapped out in international resuscitation guidelines; practical changes in these guidelines (e.g., emphasis on first compressions and updated algorithms) require the readiness and continuous updating of clinical skills by first responders, including nurses in the emergency department (Aty, Y. M. V., Tanesib, I., & Mochsen, R., 2021). Beyond these technical protocols, nurses' experiences during resuscitation influence decision-making, team coordination, and the quality of the resuscitation itself. Several international qualitative studies report that nurses experience a mix of emotions, ranging from anxiety and time pressure to a sense of professional responsibility, and emphasize the importance of repeated practice, simulations, and debriefing to reduce anxiety and increase confidence when facing chaotic and dynamic resuscitation situations. Similar findings also indicate non-technical factors (communication, leadership, team support) often determine the success of the resuscitation process (Cristy, N. A., Ryalino, C., Suranadi, I. W., & Hartawan, 2022).

Nurses in emergency departments, ICUs, and critical care units are often on the front lines of cardiac arrest management. Therefore, the quality of nurses' knowledge, skills, and experience in performing CPR is are crucial factor in determining the outcome of resuscitation (Kuchaki, Z., Taheri, M., Esfahani, H., & Erfanifam, T., 2022). However, the implementation of CPR by nurses not only requires technical and cognitive abilities (knowledge & skills), but is also influenced by experience, psychological reactions, team dynamics, and urgent situations in the emergency room which often cause pressure, stress, and ethical dilemmas (Lee MR, Cha C, 2018).

Several studies have shown that nurses' knowledge and training levels influence their ability to perform CPR in accordance with standards. For example, a study at Pelamonia Hospital found that nurses' knowledge of CPR procedures was considered "adequate," but still differed from international guidelines (Thalib, A. H., & Nur Aisa, 2020). In addition, low knowledge and procedural uncertainty can be fatal for patients (Aty, Y. M. V. B., & Blasius, G., 2021), the psychological and emotional aspects experienced by nurses during and after performing CPR have also received attention. In a qualitative study in Korea, ED nurses reported feelings of tension, internal conflict, and long-term psychological impacts after performing CPR (Lee, M. R., & Cha, 2018). This condition shows that carrying out CPR is not just a technical action but also a complex process that affects nurses as individuals and as part of a health team.

With the above considerations in mind, exploring the experiences of emergency nurses in performing CPR on cardiac arrest patients is important, as it can help understand what factors support or hinder the quality of CPR, as well as how systemic training and support can be optimized to improve patient outcomes. This literature review aims to identify the experiences of emergency nurses performing cardiopulmonary resuscitation (CPR) on patients with cardiac arrest, based on previous research.

OBJECTIVE

Cardiac arrest is a critical emergency requiring rapid intervention and strict adherence to international resuscitation guidelines to ensure patient survival. While these guidelines map out the chain of action, practical implementation demands continuous readiness and the updating of clinical skills by first responders, particularly emergency nurses (Aty, Tanesib, & Mochsen, 2021). However, the successful execution of Cardiopulmonary Resuscitation (CPR) extends beyond technical protocols; it is significantly influenced by non-technical factors such as communication, leadership, and team support (Cristy, Ryalino, Suranadi, & Hartawan, 2022). Furthermore, the quality of a nurse's knowledge, skills, and experience acts as a crucial determinant in the final outcome of resuscitation efforts (Kuchaki, Taheri, Esfahani, & Erfanifam, 2022). Additionally, the procedure is a complex process often accompanied by psychological pressure, stress, and ethical dilemmas that impact the nurse as an individual (Lee & Cha, 2018). Therefore, this literature review aims to identify and analyze the experiences of emergency nurses in performing CPR on cardiac arrest patients to understand the factors that support or hinder resuscitation quality.

METHODS

This research is a literature review. The population and sample used international and national journals related to the experiences of emergency nurses, CPR, and cardiac arrest. This article employs a structured qualitative literature review to synthesize existing evidence on emergency nurses' experiences in performing cardiopulmonary resuscitation in cardiac arrest patients. The search was conducted through electronically published journals via the Google Scholar database. Literature review search using Google Scholar electronic database, Science Direct published in 2020-2025 with search keywords emergency OR Emergency AND Nurse OR Nurse AND CPR OR CPR AND Cardiac Arrest OR Cardiac Arrest. Inclusion Criteria are Journals related to Emergency Nursing Experience & Journals discussing cardiopulmonary resuscitation. Data analysis involved critical appraisal, skimming, and scanning, separating irrelevant articles from relevant ones.

RESULTS

Table 1. Review Article Analysis Results

Reserchear & years	Title	Studi desain	Populasi sample	Finding
Smith et al., 2020	Experiences of Emergency Nurses in Performing CPR	Kualitatif, fenomenolog	12 emergency nurses	Nurses experience high stress, a need for training, and constraints of limited equipment
Handayani & Sutopo, 2020	Analisis Kemampuan Penolong Awam	Mixed-method	34 community	Lack of training impacts the effectiveness of

|			respondents	Actions
	dalam Pertolongan Darurat			
Lee & Kim, 2019	Emergency Nurses' Perception of Cardiac Arrest Management	Quantitative survey	210 emergency nurses	Work experience influences confidence in performing CPR
Setiawan, 2025	Kompetensi Perawat Emergency dalam RJP	Survei Quantitative	85 nurses RS type B & C	Regular training improves the quality of CPR and the clinical readiness of nurses.
Rahmawati, 2022	Pengalaman Perawat dalam Penanganan Cardiac Arrest	Qualitative	10 emergency room nurses	Nurses experience time pressure, fear of making mistakes, and the need for clear SOPs.
Yusuf & Pratiwi, 2023	Evaluasi Kompetensi RJP Perawat Emergency	Observasional	60 nurse	Nurses experience time pressure, fear of making mistakes, and the need for clear SOPs.
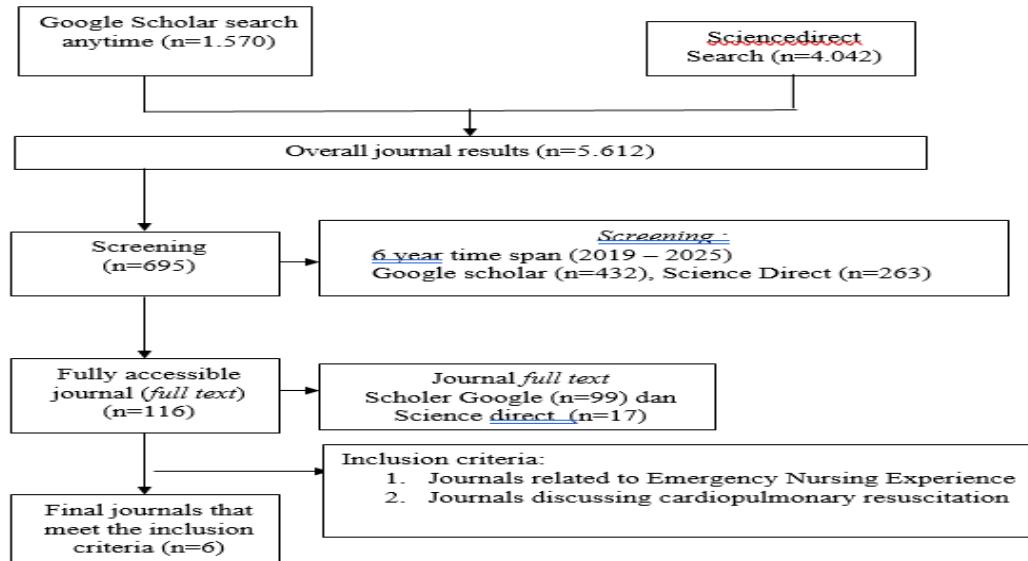
Figure 1. Article Searching

DISCUSSION

Emergency nurses' experience in performing cardiopulmonary resuscitation (CPR) is a critical factor influencing the successful management of cardiac arrest patients. The literature shows that a nurse's ability to perform CPR depends not only on technical skills but also on mental preparedness, clinical experience, team coordination, and emergency department workload. According to the American Heart Association (AHA, 2020), the quality of CPR is influenced by the healthcare provider's competence in performing effective compressions, adequate ventilation, and timely application of the cardiac arrest management algorithm.

Several studies have shown that nurses with more experience in emergencies tend to respond more quickly and accurately to cardiac arrest. This is supported by findings by Hasanah & Yusuf (2023), who showed that clinical experience contributes to increased confidence and decision-making skills in critical situations. This experience helps nurses recognize clinical signs more quickly, reduces hesitation, and increases the effectiveness of interventions.

On the other hand, psychological conditions and emotional stress also influence nurses' experiences when performing CPR. A qualitative study by Yuliana et al. (2021) emphasized that emergency nurses often face anxiety, time pressure, and high performance demands during resuscitation. This pressure can affect accuracy, physical stamina, and communication between team members. However, repeated experience in similar situations provides greater adaptability, making nurses better prepared for the next incident.

Work environment factors, such as equipment availability, operational standards, and team dynamics, also influence nurses' experiences. Research by Wulandari (2024) found that high workloads in the emergency department and ineffective team coordination can hinder optimal CPR implementation. Good team coordination has been shown to improve compression accuracy, role alignment, and decision-making during code blues.

Regular training is another crucial factor. The AHA (2020) emphasizes that CPR skills tend to decline within 3–6 months without rehearsal, so regular training programs are necessary to maintain competency. Setiawan (2025) adds that training and simulations improve motor skills, technical accuracy, and mental preparedness for nurses facing cardiac arrest. Training also helps nurses internalize algorithms and procedures, allowing for faster and more structured interventions.

This literature review highlights that emergency nurses frequently experience significant psychological impacts, including stress, emotional exhaustion, and moral distress, when performing cardiopulmonary resuscitation on cardiac arrest patients. Coping strategies such as peer support, clinical debriefing, resilience training, and supportive leadership are identified as essential in mitigating these psychological burdens. However, this review is limited by the heterogeneity of study designs, variations in cultural and clinical contexts, and the predominance of qualitative studies with small sample sizes, which may affect the generalizability of findings. Additionally, publication bias and the restriction to English-language articles may have limited the scope of the evidence. Therefore, future research is recommended to employ mixed-methods and longitudinal designs, explore culturally diverse emergency settings, and evaluate the effectiveness of structured psychological support interventions for emergency nurses.

Overall, the literature review shows that emergency nurses' experience in performing CPR is a result of the interaction between technical competence, clinical experience, psychological preparedness, teamwork effectiveness, and ongoing training. Positive experiences can improve CPR performance, while negative experiences, such as failed resuscitation, can be emotionally burdensome and require psychological support. Therefore, healthcare institutions need to ensure routine CPR training, provide a supportive work environment, and strengthen a teamwork culture to improve the quality of cardiac arrest patient care.

CONCLUSION

The literature review indicates that emergency nurses' experience in performing cardiopulmonary resuscitation (CPR) on cardiac arrest patients is influenced by a combination of technical skills, psychological preparedness, the work environment, and ongoing training. Adequate clinical experience enables nurses to more quickly recognize cardiac arrest, make appropriate decisions, and perform compressions and ventilations according to standards. Mental preparedness and the ability to manage emotional distress have also been shown to contribute to the quality of CPR implementation, especially in emergency situations with high time pressure. Furthermore, teamwork dynamics and the emergency room environment significantly determine the effectiveness of resuscitation measures. Good team coordination can expedite the treatment process and increase the chances of successful resuscitation. Routine training and simulations are crucial in maintaining nurse competence, as CPR skills can decline without regular training. Therefore, improving the experience and competence of emergency nurses needs to be supported by institutional policies through ongoing training, psychological support, and the establishment of a solid teamwork culture. Overall, emergency nurse experience is a key element in the successful implementation of CPR on cardiac arrest patients. Strengthening the capacity of nurses through education, training, and work environment support is a strategic step to improve the quality of emergency services and patient safety.

CONFLICTS OF INTEREST

There are no conflicts of interest in this article.

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THE EFFECTIVENESS OF TAI CHI IN REDUCING DEPRESSION LEVELS IN THE ELDERY

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ABSTRACT

Background: Older adults are a group that is vulnerable to psychological changes, including depression. Depression in older adults can lead to a decline in overall well-being and increase the risk of additional health complications. One non-pharmacological intervention that can help reduce symptoms of depression is Tai Chi, which involves rhythmic movements and can improve physical and psychological balance.

Purpose: The purpose of this study was to examine how Tai Chi exercises affect depression levels among elderly people living in Purbayan Village.

Methods: This study used a quantitative approach with a pre-experimental design, in which one group underwent pre-test and post-test assessments. Participants were selected through random sampling based on inclusion criteria, which required elderly individuals who were able to perform daily activities independently. Data were collected using the Indonesian version of the Patient Health Questionnaire-9 (PHQ-9), which showed validity scores ranging from 0.508 to 0.907. The intervention involved Tai Chi exercises consisting of eight movements, performed independently at home for 30 minutes per session, three times a week.

Results: The results showed a decrease in the average depression score of 4.9 after the Tai Chi exercise intervention. Statistical analysis using a paired t-test showed a p-value of 0.000 (< 0.05), indicating a significant effect of the intervention.

Conclusion: Tai Chi exercises have been proven to reduce depression levels in older adults. This intervention has been proven effective as a non-pharmacological approach to improving mental well-being and overall quality of life among older adults.

Keywords: Depression, Elderly, Mental Health,Tai Chi

BACKGROUND

Aging is an inevitable part of life that every individual will experience (Nathalia & Elvira, 2020). As they age, older adults are prone to various health problems, one of which is depression. Depression in older adults is a psychological condition characterized by prolonged sadness, decreased interest in daily activities, sleep disturbances, fatigue, and an overall decline in life satisfaction (WHO, 2023).

The elderly population worldwide is expected to continue to increase in line with rising life expectancy in Indonesia (BPS, 2023).

Based on the classification proposed by the World Health Organization (WHO), individuals aged 45–59 years are considered middle-aged adults, those aged 60–74 years are categorized as early elderly, individuals aged 75–90 years as older elderly, and those over 90 years as very old elderly (Norlinta & Sari, 2021).

Based on data from the Central Statistics Agency (BPS, 2023), elderly women dominate the population structure of this group with a percentage of 52.28%, while elderly men account for 47.72%. In terms of age groups, seniors aged 60–69 years old contribute the most, accounting for 63.59% of the total senior population, and most of them live in urban areas.

The increase in the elderly population is accompanied by a number of health challenges, including psychological disorders such as depression. Globally, the prevalence of depression among the elderly is estimated to range from 8–15%, with an average of 13.5% based on analyzes across various countries (Salfia et al., 2020). In Indonesia, the prevalence of mild to severe depression in the elderly reaches 32%, with a higher risk in the 55–64 age group (approximately 0.7%), increasing to 10.0% in the 65–74 age group, and exceeding 10.0% for those aged 75 and over (Salfia et al., 2020).

Depression in the elderly is a mental health issue that requires serious attention as the population of this age group increases in Indonesia. The aging process involves physical, biological, psychological, and social changes that can potentially trigger depression. Various factors, such as loss of a partner, decline in physical abilities, chronic illnesses, and lack of family support, contribute to an increased risk of depression in the elderly (Yuniartika et al., 2021). This condition often causes the elderly to experience prolonged sadness, loss of interest in daily activities, and a tendency to withdraw from social interaction (Salfia et al., 2020).

Some studies show that depression in the elderly is influenced by gender, health conditions, and the duration of chronic illness. Yuniartika & Murti (2020) found that elderly women with a history of long-term chronic diseases, such as hypertension, are more susceptible to depression than men due to hormonal differences and emotional vulnerability.

Depression in the elderly is multifactorial and requires a comprehensive approach, including physical activities such as yoga therapy or Tai Chi exercises, which have been proven effective in reducing depression levels and improving quality of life (Yuniartika et al., 2021).

As an effort to address depression in the elderly, one potential strategy is to strengthen regular physical activity. Tai Chi, a traditional Chinese practice involving gentle, flexible, and flowing movements, has been shown to be effective in reducing depression levels while simultaneously boosting self-esteem, happiness, and quality of life (Kit, 2022).

OBJECTIVE

This research aims to determine the effect of Tai Chi exercise on depression levels in the elderly in Purbayan Village, contributing to efforts to prevent and manage this issue.

METHODS

Study Design

In this study, a pre-experimental quantitative method was applied, combining a one-group pre-test–post-test model with a cross-sectional design to capture data from participants at different stages of observation.

Setting

This study was conducted at two Posyandu centers located in Purbayan Village, Baki District, Sukoharjo Regency, from July to September 2025.

Research Subject

The population in this study consists of 50 elderly individuals. A convenience sampling technique was then used, with inclusion criteria including elderly individuals capable of independent physical activity and experiencing mild to moderate depression. Exclusion criteria included elderly individuals over 80 years old, those with severe depression, and those requiring assistive devices for physical activity. A total of 30 elderly respondents were obtained.

Instruments

The respondents' level of depression was assessed using the Indonesian version of the Patient Health Questionnaire (PHQ-9), an instrument comprising nine items aimed at evaluating the presence and severity of depressive symptoms experienced during the previous. Responses are scored using a four-point Likert scale, with values ranging from 0 to 3: 0 representing *Never*, 1 representing *A Few Days*, 2 representing *More Than Half the Day*, and 3 representing *Almost Every Day*. The cumulative score, ranging from 0 to 27, reflects the severity of depression and is categorized into five levels: 0–4 (No depression), 5–9 (Mild depression), 10–14 (Moderate depression), 15–19 (Severe depression), and 20–27 (Very severe depression).

Intervention

The intervention involved 8 Tai Chi exercises, The exercise program was implemented three times a week for a total duration of 12 weeks. Each session lasted around 30 minutes and was conducted individually at the respective homes of the elderly participants. With elderly individuals experiencing mild to moderate depression, the results. The movements used include Raising and Lowering Arms, Opening and Closing Arms, Pushing Fists Forward, Swaying Body Sideways, Pushing Hands Diagonally, Raising Energy Ball, Taking Movement, and Pushing Palms Forward.

Data Analysis

To illustrate the demographic and clinical characteristics of the participants, a univariate analysis was performed, encompassing variables such as age, gender, level of education, occupation, and depression status before and after the intervention. The results of this analysis were presented in percentages and frequency distributions. Before conducting the bivariate test, To determine whether the data were normally distributed, the Shapiro–Wilk test was applied. This test was selected because it is appropriate for small sample sizes, specifically when the number of respondents is fewer than 50. Since the data were normally distributed, bivariate analysis was performed using the paired samples t-test to determine the difference in depression levels among the 30 respondents.

Ethical Consideration

The study was reviewed and approved by the Health Research Ethics Commission (KEPK) under the Faculty of Medicine, Muhammadiyah University of Surakarta (UMS), ensuring adherence to ethical standards in health research, with ethical approval number No. 5896/B.1/KEPK-FKUMS/X/2025.

RESULTS

Tabel 1. Characteristic Frequency Distribution of Samples The Effectiveness Of Tai Chi In Reducing Depression Levels In The Eldery

Characteistics	Frequency (N)	Presentation (%)
Gender		
Female	30	100
Total	30	100
Age		
Early elderly (60–65)	18	60
Middle elderly (66–70)	4	13,3
Advanced elderly (71–75)	4	13,3
Very advanced elderly (76–80)	4	13,3
Total	30	100
Education		
No attending school	6	20
Elementary school	8	26,7
Junior high school	5	16,7
High school	8	26,7
College	3	10
Total	30	100
Occupation		
Farmer/laborer	7	23,3
Housewife	22	73,3
Self-employed	1	3,3
Total	30	100

Sumber : Data Kuesioner 2025

This research was conducted at 2 Posyandu in Purbayan Village, Baki District, Sukoharjo Regency, with 30 elderly respondents, all aged 60-80 years. All elderly participants were women, with most having primary or secondary education, each with 8 respondents (26.7%). The majority of elderly participants in this study were not employed, totaling 22 respondents (73.3%).

Tabel 2. Frequency Distribution of Depression Levels in the Elderly: Pre-test and Post-test

No	Level of depression	Pre Test		Post Test	
		N	%	N	%
1.	Normal	0	0	19	63,3
2.	Mild	23	76,7	11	36,7
3.	Moderate	7	23,3	0	0
	Total	30	100	30	100

Sumber : Data Kuesioner 2025

The results in Table 2 show that the pretest data indicates the majority of elderly individuals have mild levels of depression, with 23 respondents (76.7%), followed by 7 respondents (23.3%) with moderate levels of depression. Furthermore, the posttest data shows that the majority of respondents have normal levels of depression, with 19 respondents (63.3%), followed by 11 respondents (36.7%) with mild levels of depression.

Analisis Bivariat
Tabel 3. Paired Sample T-Test Results

Variable	Mean Difference	t	df	Asymp. Sig. (2-tailed)
Pretest-Posttest	4.900	17.968	29	0.001

Sumber : Data 2025

Based on the Paired Sample T-test analysis, a significant reduction in depression scores was observed after the Tai Chi exercise intervention compared to before the intervention. The test yielded a mean difference of 4.900, a t-value of 17.968, and degrees of freedom (df) = 29,

confirming the effectiveness of the intervention.Result of the statistical test show revealed a significance value (Sig. 2-tailed) of 0.001, which is smaller than the threshold value of 0.05. This result demonstrates a significant difference between the pretest and posttest measurements, supporting the hypothesis that Tai Chi exercise effectively reduces depression levels among the elderly population in Purbayan Village. Consequently, it can be concluded that participation in Tai Chi sessions contributes to a meaningful decrease in depression symptoms among older adults.

DISCUSSION

Final of result indicate a significant change in the level of depression among the elderly after Tai Chi intervention (p = 0.001). This study shows that Tai Chi exercises have an effect in reducing depression levels. From a physiological perspective, Tai Chi uses slow movements and deep breathing, which can contribute to a decrease in stress hormones and an increase in emotional balance (Nguyen et al, 2023).

The findings of this research corroborate those of Rahardjo and Santosa (2021), who also reported similar outcomes in study, which shows that in the early stages of old age, a person begins to experience physiological changes that can cause a decline in bodily functions, sleep problems, and shifts in social roles, which can potentially trigger mild to moderate symptoms of depression. Additionally, women are more prone to depression due to decreased estrogen levels after menopause, which plays a role in regulating emotions and neurotransmitter stability in the brain. Therefore, this study was dominated by female respondents.

Similarity also occurs in the findings made are consistent with the theory proposed by Karyono (2021), which states that light physical activity such as Tai Chi can increase endorphin levels in the body, improve mood, and reduce stress and depression in the elderly. Tai Chi exercises are a form of exercise that combines gentle movements, deep breathing, and mental concentration that can stimulate the parasympathetic nervous system, thereby providing relaxation and emotional calm.

The results of this research align with the findings presented by Wachidah Yuniartika (2022), who also emphasized similar outcomes, who found that the involvement of older adults in regular physical activity can significantly reduce depression levels. Older adults who are physically active have better self-confidence and better social interactions, which ultimately affect their psychological health.

In addition, research (Sari & Widyastuti, 2020) shows that older adults who regularly participated in Tai Chi exercises for three weeks experienced a significant decrease in depression levels compared to individuals who who did not participate. The mechanism of depression reduction through Tai Chi is related to increased blood circulation to the brain and increased secretion of neurotransmitters that play a role in emotional stability, such as serotonin and dopamine.

This explains that depression in the elderly is a common problem, which can be triggered by various biological, psychological, and social factors such as decreased physical ability, limitations in daily activities, and loneliness due to lack of social interaction (Lestari et al., 2022).

The findings of this study indicate that success of Tai Chi in improving the psychological condition of the elderly. This study is in line with research conducted by (Astusti & Pratiwi, 2022), which revealed that Tai Chi can increase relaxation, improve sleep quality, and reduce cortisol levels through increased endorphins, thereby improving mood and reducing manifestations of depression.

The findings of this study are consistent with those reported by (Rahman & Utami 2024), which concluded that Tai Chi exercises are very effective in reducing depression levels and improving social interaction in older adults. Therefore, Tai Chi can be used as an easy, safe, and affordable non-pharmacological intervention exercise approach to support the mental health of older adults.

CONCLUSION

Based on findings from the health center in Purbayan Village, Baki District, Sukoharjo Regency, it can be concluded that Tai Chi exercise has an influence on the level of depression experienced by the elderly. With the results obtained, the elderly who experience depression are mostly aged 60-65 years (early elderly). From the results of the effect test, it can be concluded that Tai Chi exercises can affect depression levels, as seen from the percentage results before the elderly were given the intervention and the percentage after the intervention was given.

According to the bivariate analysis, the obtained p-value was less than 0.05, confirming that the intervention significantly affected the depression levels of elderly participants in Purbayan Village, located in Baki District, Sukoharjo Regency.

SUGGESTIONS

It is hoped that the community, especially families with elderly members, can focus more deeply on psychological condition of the elderly at home. The community can use findings from this study to raise awareness regarding the importance of early detection of symptoms of depression and to immediately consult a health professional if signs of depression are found.

ACKNOWLEDGMENT

CONFLICTS OF INTEREST

The author has no conflicts of interest in completing this research.

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IMPLEMENTATION OF THE KMB DIGITAL EDUCATION APPLICATION ON COMPLIANCE AND WOUND HEALING OF POST-ABDOMINAL SURGERY PATIENTS AT PEMANGKAT REGIONAL HOSPITAL

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ABSTRACT

Background: Health education is a crucial component in improving patient adherence to wound care, particularly among individuals recovering from abdominal surgery. Improper wound care can increase the risk of infection and delay the healing process. The integration of digital technology in healthcare provides innovative solutions for patient education. The KMB Digital Education Application serves as a medium to enhance patients' understanding of postoperative wound management, enabling them to follow care instructions more consistently and achieve faster recovery.

Objectives: This study aimed to determine the effect of the KMB Digital Education Application on patient adherence and wound healing among post-abdominal surgery patients at Pemangkat Regional Hospital.

Methods: This research employed a quasi-experimental design with a pretest-posttest control group approach. A total of 50 post-abdominal surgery patients were selected using purposive sampling and divided equally into intervention and control groups. The intervention group received education through the KMB Digital Application, while the control group received standard education. Data were collected using observation sheets and analyzed using Repeated Measure ANOVA.

Results: The findings revealed a significant improvement in patient adherence within the intervention group, increasing from 31.12 ± 1.20 to 46.44 ± 1.56, compared to the control group, which only rose from 28.68 ± 1.07 to 33.24 ± 0.97 ($p < 0.001$). Wound healing outcomes also showed significant differences between groups, where the intervention group's healing scores improved from 42.32 ± 2.19 to 21.84 ± 2.19, while the control group improved from 42.36 ± 1.87 to 36.48 ± 1.16 ($p < 0.001$).

Conclusion:The implementation of the KMB Digital Education Application significantly enhances patient adherence to wound care and accelerates wound healing among post-abdominal surgery patients. The use of digital education technology can therefore be an effective innovation to support postoperative recovery and improve the quality of nursing care.

Keywords: Digital Application, Patient Adherence, Wound Healing, Post-Abdominal Surgery

BACKGROUND

Surgery is one of the most frequently performed medical procedures in various hospitals as a treatment for diseases that cannot be managed with conservative therapy. After surgery, the patient's recovery phase is highly dependent on optimal wound healing. Surgical wounds, especially those in the abdominal area, require special attention due to the high risk of complications such as infection, wound dehiscence, and delayed healing due to patient non-compliance with wound care (Anderson, 2021). Globally, postoperative wound complications remain a major cause of prolonged hospitalization and increased healthcare costs, with infection rates reaching 10–20% depending on surgical type and hospital environment (WHO, 2020).

Patient compliance with post-operative care plays a crucial role in wound healing outcomes. Lack of understanding and education often leads to patients ignoring medical instructions, failing to change dressings as directed, and ignoring early signs of infection (Nursalam, 2020). Previous research has shown that the rate of non-compliance among post-abdominal surgery patients in Indonesia remains high, with wound complications reaching 25–30% of total major surgical cases (Ministry of Health, 2022). Non-adherence not only delays the healing process but also increases the likelihood of rehospitalization, antibiotic use, and the burden on healthcare resources.

Additionally, environmental and cultural factors, as well as limited access to health education, influence patient behavior. Most patients in non-urban areas struggle to receive ongoing education after hospital discharge, even though the home care phase is crucial for the quality of recovery (Sari, 2023). This disconnect between patients and healthcare professionals during the home care phase often presents a barrier to maintaining continuity of nursing care. Conventional health education, such as brief counseling or printed materials, is often insufficient to ensure consistent understanding and compliance, as patients may forget instructions or lack motivation for self-care. Furthermore, family support, literacy levels, and access to information technology also play a determining role in shaping adherence behavior.

In the framework of behavioral health theories, such as the Health Belief Model (HBM) and Self-Efficacy Theory, patient adherence is influenced by the individual's perceived susceptibility to complications, perceived benefits of action, and confidence in performing care activities. Digital education can strengthen these psychological components through repetitive learning, visual demonstration, and feedback features that reinforce behavioral change (Putri, 2021). By integrating multimedia elements and real-time reminders, digital health tools promote active patient participation and empower individuals to take responsibility for their health outcomes.

Digital transformation in nursing opens up significant opportunities to improve the effectiveness of health education. The use of digital applications allows patients to access information, receive guidance, and independently monitor adherence under remote supervision by healthcare professionals. Studies have shown that digital-based nursing education improves health literacy, strengthens self-efficacy, and accelerates wound healing (Rahmawati, 2022). Moreover, digital technology bridges communication gaps between patients and nurses, especially in rural or resource-limited settings, where distance and limited manpower often hinder continuous patient engagement.

As an innovation based on Evidence-Based Nursing Practice (EBNP), the KMB Digital Education application was developed to serve as an educational and self-monitoring tool for post-abdominal surgery patients. This application consists of five main modules: wound care, nutrition, mobilization, medication, and red flags, compiled based on the latest clinical guidelines for wound care. In addition to providing interactive information, the application also features a daily checklist and reminder system to help patients maintain adherence to wound care at home (Kurniawati, 2023).

Its design aligns with WHO's Digital Health Framework, emphasizing accessibility, user-centered design, and integration with clinical care pathways.

A preliminary study at Pemangkat Regional Hospital (RSUD Pemangkat) showed that most post-abdominal surgery patients did not understand the importance of comprehensive wound care and lacked structured self-education tools. This finding highlights a gap in the implementation of digital nursing interventions, especially in secondary-level hospitals in Indonesia. Previous studies have largely focused on chronic wound care or diabetic ulcers, while evidence related to post-surgical wound healing remains limited.

Therefore, the implementation of the KMB Digital Education application is expected to be an innovative solution to improve patient compliance and accelerate post-abdominal surgery wound healing. In addition, this study provides empirical evidence regarding the effectiveness of digital health education in rural hospital settings and contributes to the development of EBNP-based nursing innovations in Indonesia.

OBJECTIVE

The general objective of this research is to determine the effect of the KMB Digital Education Application on patient compliance and wound healing among post-abdominal surgery patients at Pemangkat Regional Hospital.

METHODS

Study Design

This research employed a quasi-experimental design with a pretest-posttest control group approach. The study was conducted at Pemangkat Regional Hospital from May to July 2025.. A total of 50 post-abdominal surgery patients were selected using purposive sampling and divided equally into intervention and control groups. The intervention group received education through the KMB Digital Education Application, while the control group received standard postoperative education. Data were collected using observation sheets measuring patient compliance and wound healing progress, and analyzed using the Repeated Measure ANOVA test with a significance level of $p < 0.05$.

Setting

The research was conducted in the surgical ward of Pemangkat Regional Hospital, West Kalimantan, Indonesia, from May to July 2025. The hospital was chosen as the study site because it manages a large number of postoperative abdominal surgery patients and has implemented digital health innovations in patient education.

Research Subject

A total of 50 respondents participated in this study, selected through a purposive sampling technique. The participants were divided equally into two groups, consisting of 25 individuals in the intervention group and 25 individuals in the control group. The inclusion criteria for participation were patients who had undergone abdominal surgery, were conscious and able to communicate effectively, capable of using a smartphone, and willing to take part in the study by providing informed consent. Meanwhile, patients who were in critical condition or unable to operate the digital application were excluded from the study.

Instruments

Data on patient adherence were collected using a validated adherence questionnaire ($r > 0.6$; Cronbach's $\alpha = 0.89$). Wound healing progress was evaluated using the Bates-Jensen Wound Assessment Tool (BWAT), which includes parameters such as wound size, depth, edges, necrotic tissue, exudate, granulation, and epithelialization. Observations were conducted once a week for four consecutive weeks, resulting in a total of four follow-up assessments. All wound observations were carried out directly through the KMB Digital Education Application by trained nurses who monitored and recorded the patients' wound healing progress remotely.

Data Analysis

Univariate analysis was conducted to describe the distribution of respondent characteristics, including age, gender, education level, occupation, and marital status. This analysis aimed to provide an overview of the demographic and baseline characteristics of post-abdominal surgery patients participating in both the intervention and control groups. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize the data.

Bivariate analysis was performed to determine the effect of the KMB Digital Education Application on patient adherence and wound healing outcomes. The analysis compared differences between the intervention and control groups across four follow-up sessions, conducted once a week over a total period of one month. Data were analyzed using the General Linear Model Repeated Measures ANOVA to examine differences and interactions over time and between groups. A significance level of $p < 0.05$ was applied to identify statistically significant effects.

Ethical Consideration

Ethical approval for this study was obtained from the Health Research Ethics Committee of Pemangkat Regional Hospital (No. 021/KEPK-RSUDP/IV/2025). All participants were informed about the study's purpose, procedures, risks, and benefits before providing written informed consent. Confidentiality, anonymity, and voluntary participation were ensured throughout the research process.

RESULTS
Respondent Characteristics

Based on the results of the study of 50 respondents, it was found that the gender distribution between men and women was balanced, with 25 respondents (50%) each. This indicates that the respondents in this study had an equal proportion of men and women, so there was no gender dominance that could influence the research results.

Based on educational level, the majority of respondents (20 respondents) had a high school education (SMA), while 10 (20%) had a junior high school education (SMP), and 10 (20%) had a diploma 3 (D3). These results indicate that the majority of respondents had a secondary education, which is expected to be sufficient to understand the health education material provided through the KMB Digital Education application.

In terms of occupation, respondents were evenly distributed across several job categories. Ten (20%) were unemployed, ten (20%) were housewives, ten (20%) were civil servants, ten (20%) worked in the private sector, and ten (20%) worked as farmers or fishermen. This distribution indicates that the respondents' occupational backgrounds are quite diverse, reflecting variations in their levels of physical activity and access to technology in their daily lives.

Based on marital status, the majority of respondents were married (30 respondents (41.9%), while 20 (58.1%) were single. This indicates that the majority of respondents had family responsibilities, which could influence their level of attention to their health and compliance with post-operative therapy and wound care.

Tabel 1. Respondent Characteristic

Variable	f	%
Gender		
Man	25	50%
Woman	25	50%
Total	50	100%
Education		
JUNIOR HIGH SCHOOL	10	20%
SENIOR HIGH SCHOOL	30	40.0%
D3	10	20%
Total	50	100%
Work		
Doesn't work	10	20%
Housewife	10	20%
civil servant	10	20%
Private	10	20%
Farmers/Fishermen	10	20%
Total	50	100%
Marital status		
Married	30	41.9%
Not married yet	20	58.1%
Total	50	100%

Table 2. Age

Descriptive Statistics

	N	Minimum	Maximum	Mean	Standard Deviation
Age	50	21	68	41.96	13,707
Valid (N)	50				

Based on the descriptive analysis, it was found that the ages of the respondents in this study ranged from 21 to 68 years, with an average age of 41.96 years and a standard deviation of 13.71. This indicates that the respondents came from the early to late adulthood age group, with a predominance of middle age.

1. Results of the Repeated Measure ANOVA Test on the Application of the KMB Digital Education Application on Compliance and Wound Healing between the Intervention and Control Groups

Table 3. Implementation of the KMB Digital Education application on Compliance and Wound Healing between the Intervention and Control Groups

Variables	Source of Variation	df	Mean Square	F	Sig.
Compliance	Group	1	3312.980	641,222	<0.001
	Error	48	5,167	—	—
Wound healing	Group	1	2145.325	392,450	<0.001
	Error	48	5,466	—	—

The analysis showed a significant difference in mean scores between the intervention and control groups for compliance and wound healing variables ($p<0.000$). This indicates that the implementation of the KMB Digital Education application significantly improved patient compliance and accelerated wound healing after abdominal surgery.

2. Mean Value and Standard Deviation of Patient Compliance Based on Group and Measurement Time

Table 4. Mean Values and Standard Deviations of Patient Compliance Based on Group and Measurement Time

Measurement Time	Intervention Group (Mean ± SD)	Control Group (Mean ± SD)
Pretest (T1)	31.12 ± 1.20	28.68 ± 1.07
Day 2 (T2)	36.40 ± 1.41	30.20 ± 0.76
Day 3 (T3)	42.28 ± 1.46	31.56 ± 0.87

Measurement Time	Intervention Group (Mean ± SD)	Control Group (Mean ± SD)
Day 4 (T4)	46.44 ± 1.56	33.24 ± 0.97

Based on Table 4, it can be seen that the average patient compliance score in the intervention group increased significantly from pretest (31.12 ± 1.20) to day 4 (46.44 ± 1.56). In contrast, in the control group, the increase in the average compliance was smaller, namely from 28.68 ± 1.07 to 33.24 ± 0.97. This indicates that patients who received education through the KMB Digital Education Application had a higher level of compliance in carrying out wound care than patients who did not receive digital intervention. The results of the Repeated Measure ANOVA test showed a value of F = 641.222 with p < 0.001, which means there was a significant difference in patient compliance between the intervention and control groups.

3. Wound Healing Based on Group and Measurement Time

Table 5. Mean Values and Standard Deviations of Wound Healing Based on Group and Measurement Time

Measurement Time	Intervention Group (Mean ± SD)	Control Group (Mean ± SD)
Day 1 (F1)	42.32 ± 2.19	42.36 ± 1.87
Day 2 (F2)	35.04 ± 2.03	40.56 ± 1.58
Day 3 (F3)	28.52 ± 2.06	37.80 ± 1.33
Day 4 (F4)	21.84 ± 2.19	36.48 ± 1.16

Based on Table 4, it can be seen that the mean wound healing score in the intervention group experienced a significant decrease from day 1 (42.32 ± 2.19) to day 4 (21.84 ± 2.19). This decrease in score indicates a more rapid improvement in wound condition. In contrast, in the control group, the mean wound healing score decreased more slowly from day 1 (42.36 ± 1.87) to day 4 (36.48 ± 1.16).

The results of the Repeated Measure ANOVA test showed a value of F = 392.450 with p < 0.001, which means there was a significant difference between the intervention group and the control group in terms of the level of wound healing.

4. Compliance and Wound Healing Rate Graph
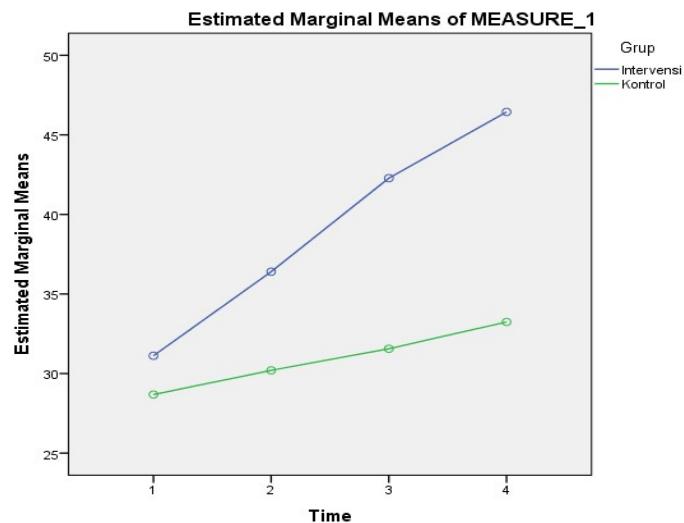
Figure 1. Mean Patient Compliance Scores (Pretest to Day 4).
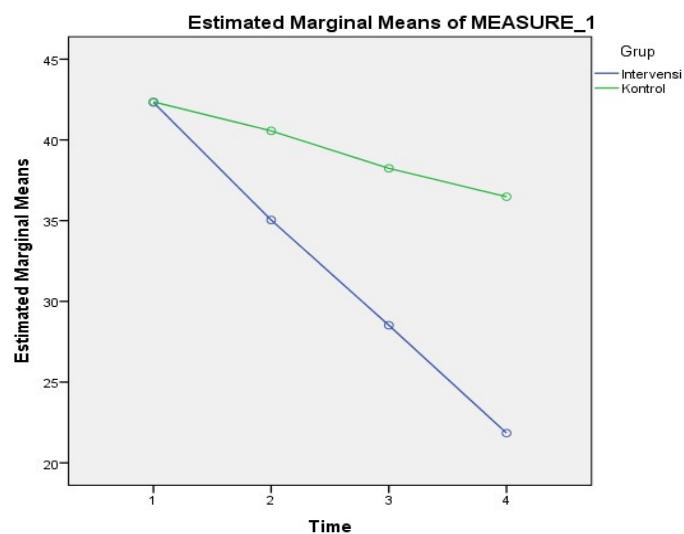
Figure 2. Wound Healing Progress (BWAT Scores)

The graph shows an increase in average patient adherence over time in both intervention and control groups. However, the increase in adherence was significantly higher in the intervention group than in the control group. On the first day, the average adherence between the two groups appeared relatively close. As time progressed (until the fourth day), the intervention group showed a sharp increase to the highest average, while the control group experienced only a relatively small increase.

These findings indicate that the KMB Digital Education Application is effective in improving patient adherence to wound care, as the digital education provided helps patients understand and consistently follow treatment recommendations. These results are in line with the Repeated Measures ANOVA test value which shows $p < 0.001$, meaning there is a

significant difference between the intervention and control groups in improving adherence over time.

DISCUSSION

1. **KMB Digital Education Application Regarding Compliance**

The results showed a significant increase in patient compliance in the intervention group after receiving education through the KMB Digital Education Application compared to the control group ($p<0.001$). Based on descriptive analysis, the mean compliance score in the intervention group increased consistently from 31.12 in the first measurement to 46.44 in the fourth measurement, with a relatively stable standard deviation (SD = 1.201–1.557). In contrast, the control group only showed a small increase from 28.68 to 33.24. This significantly greater increase in the intervention group illustrates that the use of digital applications can increase patient awareness, independence, and responsibility in carrying out post-abdominal surgery wound care instructions.

In addition to these objective results, patient perceptions of the application also showed high acceptance. Based on the survey results, 43 respondents (86%) agreed that the KMB Digital Education application helped them understand and follow treatment instructions, while only 7 respondents (14%) disagreed. Meanwhile, 39 respondents (78%) felt that the application helped their wound healing process, and only 11 respondents (22%) stated the opposite. These findings indicate that the majority of patients found the application useful and easy to use in supporting self-care. This positive perception also plays an important role in increasing patient motivation and adherence to the treatment program, as explained by the Technology Acceptance Model (TAM) theory that perceived ease of use and perceived usefulness will influence the intention and behavior of using health technology.

The KMB Digital Education app provides an interactive learning experience through modules covering wound education, nutrition, mobilization, and medication. Daily checklists and reminders help patients independently monitor daily adherence, while a monitoring menu allows healthcare professionals to conduct remote supervision. This mechanism creates a two-way feedback loop that reinforces the learning process and motivates patients to maintain consistency. This aligns with the Health Belief Model (HBM), where the app acts as a cue to action, encouraging patients to take preventative measures for wound complications and comply with care instructions.

These results support research Wahyuni, 2025 which reported a 35% increase in surgical patient compliance after being given digital education via a mobile application compared to conventional education. Study Chen (2021) also found that digital interventions increased therapy compliance in postoperative patients due to automatic reminders and easy access to information. In addition, Siregar (2023) proved that a nursing-based educational application increased adherence to wound care behavior by up to 40%.

The consistency of these results indicates that digital educational media can be an effective innovation in strengthening patient compliance behavior in a sustainable manner.

From a nursing perspective, this increase in compliance demonstrates nurses' success in optimizing educational functions through a technological approach. Referring to the Health Promotion Model (Pender, 2022), nurses play a role in facilitating patient motivation and

learning to engage in independent healthy behaviors. The KMB Digital Education application expands this role by providing a learning platform accessible outside the hospital, ensuring continuity of education, and minimizing patient dependence on direct instruction from healthcare professionals.

Thus, the implementation of the KMB Digital Education Application has been proven to improve patient compliance after abdominal surgery, both objectively (compliance score measurement results) and subjectively (perceived benefits and ease of use of the application). Digital-based education not only improves patient understanding of the importance of self-care but also strengthens patient motivation and confidence in carrying out care independently. The implication of these results is the importance of integrating digital education applications into the nursing service system to improve the quality of care, expand the reach of education, and strengthen technology-based continuity of care.

2. The Impact of KMB Digital Education Application on Wound Healing Rate

The analysis results showed that the KMB Digital Education application significantly accelerated wound healing in post-abdominal surgery patients. Based on descriptive results, the mean wound score in the intervention group decreased more rapidly, from 42.32 in the first measurement to 21.84 in the fourth measurement. In contrast, the control group only decreased from 42.36 to 36.48 during the same period. The greater reduction in wound scores in the intervention group indicates that education and monitoring through the application play a significant role in accelerating the wound tissue regeneration process.

The consistent reduction in wound scores over time in the intervention group indicates that patients are able to perform wound care correctly according to the app's guidelines. Features including visual education, daily reminders, and step-by-step instructions help patients maintain wound hygiene, change dressings using aseptic techniques, and maintain a nutritional regimen that supports healing. The app also provides two-way communication between patients and caregivers, allowing patients to regularly report wound conditions and receive prompt feedback on signs of infection or delayed healing.

The accelerated reduction in BWAT scores observed in the intervention group can be attributed to the specific 'Red Flag' and 'Nutrition' modules within the KMB Application. Unlike standard verbal education, the application provides visual references for infection signs (Red Flags), allowing patients to identify complications such as abnormal exudate early. Additionally, the daily checklist feature ensures adherence to high-protein dietary recommendations, which is physiologically essential for collagen synthesis and tissue regeneration. This continuous digital monitoring minimizes the self-care deficit, directly contributing to the faster decline in wound severity scores compared to the control group.

This finding is in line with the Self Care Deficit theory Orem (2021) which explains that individuals who have good educational support and information sources will be able to increase their self-care agency capacity, including in carrying out independent wound care. The KMB Digital Education application acts as a digital self-care support media that increases patients' ability to carry out promotive and preventive actions against wound complications.

This research is also supported by the results of research Zhang (2021) which shows that the use of mobile applications in post-operative wound care education can accelerate

wound healing up to 25% faster than conventional methods. Research Pratiwi (2023) and Sari (2023) also reported that the use of digital-based educational media reduces the level of wound inflammation and accelerates the formation of granulation tissue in post-laparotomy patients. Similar findings were also obtained by Kumar (2022) which explained that digital applications can increase patient regularity in changing dressings, monitoring wound moisture, and reporting complaints in real-time, thereby accelerating the epithelialization process.

From a nursing perspective, these results demonstrate that the use of digital technology can expand the educational and monitoring functions of nurses. Through a digital approach, education can be provided continuously outside the hospital setting, thereby enhancing continuity of care. This supports the concept of nursing informatics, which positions technology as a tool to improve the quality of nursing care.

Thus, the implementation of the KMB Digital Education Application has proven effective in accelerating wound healing in post-abdominal surgery patients. Interactive education, easy access to information, and rapid communication support enable patients to be more consistent in following standardized care. These results highlight the importance of developing and integrating digital applications into nursing practice as an innovative strategy to improve clinical outcomes and quality of life for post-operative patients.

IMPLICATION

The findings of this study imply that the integration of the KMB Digital Education Application can serve as an effective innovation in postoperative nursing care. By utilizing a digital platform containing educational modules, reminders, and monitoring features, patients become more engaged in their recovery process and demonstrate better adherence to wound care instructions. This digital approach enhances nurse–patient interaction, supports continuity of care beyond hospital settings, and promotes faster wound healing outcomes. Hospitals can adopt similar digital education models to improve patient compliance and clinical recovery rates, particularly among surgical patients who require continuous postoperative guidance.

CONCLUSION

This study concludes that the implementation of the KMB Digital Education Application significantly improves patient compliance and accelerates wound healing among post-abdominal surgery patients compared to standard verbal education. The structured modules and reminder system within the application effectively support patients in performing proper wound care, maintaining nutrition, and adhering to mobilization and medication instructions. Thus, the KMB Digital Education Application proves to be a beneficial complementary tool for enhancing the quality and effectiveness of postoperative nursing interventions.

SUGGESTIONS

It is recommended that hospitals and healthcare providers integrate digital education platforms such as the KMB Application into their postoperative care protocols. Nurses should be trained to guide patients in using the application effectively to ensure consistent monitoring and feedback. For nursing education institutions, incorporating digital health technology into

curricula can enhance students' readiness for technology-assisted patient care. Future researchers are encouraged to explore the long-term effects of digital education Interventions on different types of surgical patients and to assess cost-effectiveness, user engagement, and scalability across various healthcare settings.

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CONFLICTS OF INTEREST

Nothing conflict

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THE EFFECTIVENESS OF AROMATHERAPY RELAXATION TECHNIQUES AND SLOW STROKE BACK MASSAGE STIMULATION ON CHANGES IN PAIN INTENSITY IN POST-HYDRONEPHROSIS SURGERY PATIENTS AT AMIRA GENERAL HOSPITAL IN 2024

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ABSTRACT

Background: Post-hydronephrosis surgery patients may experience pain. The physical impacts of pain include rapid breathing, increased heart rate, elevated blood pressure, increased stress hormones, delayed healing, and decreased immune function. Pain reduction can be achieved through pharmacological and non-pharmacological approaches. One non-pharmacological method includes aromatherapy relaxation therapy, SSBM stimulation, and a combination of both aromatherapy relaxation and SSBM stimulation.

Objectives: To identify the effectiveness of aromatherapy relaxation techniques and slow stroke back massage stimulation on changes in pain intensity among post-hydronephrosis surgery patients at Amira General Hospital

Methods: This study utilized a quantitative research approach with a quasi-experimental design, specifically employing a pretest-posttest design with three intervention groups. The population consisted of post-hydronephrosis surgery patients at Amira General Hospital. The sample involved 21 respondents, divided into three groups: aromatherapy relaxation therapy (7 respondents), SSBM stimulation (7 respondents), and a combination of aromatherapy relaxation and SSBM stimulation (7 respondents). The sampling technique used was purposive sampling. The research instrument used for data collection was an observation sheet. Data analysis was conducted using dependent t-test and independent t-test.

Results: The study found that changes in pain intensity before and after intervention in post-hydronephrosis surgery patients showed the following p-values: aromatherapy relaxation therapy $p = 0.3711$, SSBM stimulation $p = 0.001$, combination therapy (aromatherapy relaxation and SSBM stimulation) $p = 0.017$, and combination therapy $p < 0.001$. Based on the independent t-test results, $p < 0.05$ indicated a significant difference in pain intensity changes between aromatherapy relaxation, SSBM stimulation, and their combination in post-hydronephrosis surgery patients at Amira General Hospital.

Conclusion: Slow Stroke Back Massage (SSBM) stimulation and the combination therapy (Aromatherapy + SSBM) demonstrated a significant effect on reducing pain intensity in post-hydronephrosis surgery patients. However, aromatherapy relaxation alone did not show a statistically significant effect. The combination therapy provided the most optimal reduction in pain intensity.

Keywords: Aromatherapy Relaxation, Combination, Hydronephrosis, Slow Stroke Back Massage

BACKGROUND

The incidence of hydronephrosis based on data collected from hospitals across Indonesia in 2002 was 37,636 new cases, with the highest number of visits recorded at 58,959 patients (Faktor et al., 2023). Other data indicate that the incidence of hydronephrosis in the population reaches 5–12%, with the peak occurrence between the ages of 35 and 55 years (Faktor et al., 2023). The adverse effects of untreated hydronephrosis can lead to serious complications, including urinary tract infections (UTIs). Children with moderate to severe hydronephrosis are at a higher risk of developing UTIs. Renal scarring may occur, and if left untreated, hydronephrosis can cause hypertension. In some cases, untreated hydronephrosis may lead to kidney failure, meaning the kidneys can no longer function. Hydronephrosis is caused by an obstruction in urine secretion, resulting in fluid overload problems. According to urological literature, the degree of obstruction can influence the severity of hydronephrosis. In advanced cases, hydronephrosis can lead to decreased kidney function, eventually progressing to chronic kidney failure (Choirul Cahya Fadilah et al., 2020). In addition, the high prevalence of hydronephrosis remains a significant concern, highlighting the need for greater attention and effective strategies to address and reduce its occurrence.

The prevalence of hydronephrosis in the United States reaches 31.1%, with cases recorded at 2.9% in women, 2.9% in men, and 2–2.5% in children (Choirul Cahya Fadilah et al., 2020). In Indonesia, the incidence of hydronephrosis is reported at 34% and has increased to 85% (Faktor et al., 2023). Hydronephrosis is the dilation of the pelvicalyceal system due to impaired urine excretion, which can be caused by either obstructive or non-obstructive factors. It is a common medical problem encountered by primary care providers, emergency physicians, and urologists worldwide. Hydronephrosis is classified into obstructive and non-obstructive types, with obstruction most commonly caused by urinary tract stones (Alshoabi, 2018).

Based on hospital data across Indonesia, urinary tract stones are the leading cause of hydronephrosis, with 58,959 hospital visits, 37,636 new cases, 19,018 hospitalizations, and 378 deaths (Baskoro & Rodjani, 2013). Additional data from Cipto Mangunkusumo Hospital show an increasing number of cases of urinary tract stones: 182 patients in 1997, rising to 847 patients in 2002 (Baskoro & Rodjani, 2013). In 2023, medical records from Amira General Hospital Purwakarta reported a rise in inpatient cases diagnosed with hydronephrosis: 64 patients between January and June and 180 patients between July and December. In general, patients require adequate fulfillment of physiological needs. Since hydronephrosis involves obstruction or blockage in the kidneys, patients commonly experience pain (Tulis et al., 2021).

The physical effects of pain include rapid breathing, increased heart rate, elevated blood pressure, increased stress hormone levels, delayed healing, and decreased immune function. Pain also has psychological impacts such as anxiety, stress, sleep disturbances, and fear. Pain management can be performed pharmacologically through the administration of analgesics and sedatives, or non-pharmacologically through distraction, relaxation, warm or cold compress stimulation, deep breathing exercises, music therapy, aromatherapy, reiki, guided imagery, hypnosis, and relaxation techniques. Many patients often believe that medication is the only effective option for pain relief. However, non-pharmacological methods, when applied, can also be very effective in reducing pain(Virgona Bangun et al., 2013).

With the increasing incidence of hydronephrosis, there is a growing need for therapeutic modalities to help reduce pain experienced by patients. Recent studies have highlighted those complementary therapies, particularly aromatherapy with essential oils, can provide comfort and help prevent infection. Aromatherapy, as a complementary therapy, has analgesic, anti-inflammatory, and antimicrobial properties, making it effective in pain and infection management. It uses essential oils derived from the fragrant parts of plants to reduce health problems and improve quality of life. Scents directly affect the brain similarly to analgesic drugs; for example, the scent of lavender can increase alpha brain waves, promoting relaxation (Virgona Bangun et al., 2013). Research conducted by Suyanto & Kristian Nugroho (2023) also showed that aromatherapy relaxation is effective in reducing pain among patients experiencing discomfort.

Another therapy that can be applied to reduce pain intensity in patients with hydronephrosis is Slow Stroke Back Massage (SSBM). Previous studies have examined the effects of back massage on pain intensity, showing significant changes in pain levels after receiving back massage compared to before the intervention (Prastianto, 2017).

SSBM is a form of cutaneous stimulation used to relieve pain by activating the faster A-beta sensory fiber transmission, which acts as a neurotransmitter, thereby reducing pain transmission through the smaller-diameter C and A-delta fibers and closing the synaptic gate for pain impulse transmission. This stimulation triggers peripheral nerve fibers to send impulses through the dorsal horn of the spinal cord. When impulses carried by A-beta fibers dominate, the gate control mechanism closes, preventing pain impulses from being transmitted to the brain. The effectiveness of SSBM in providing relaxation and pain relief has been supported by previous research.

Based on observations at Amira General Hospital in 2023, among 244 post-hydronephrosis surgery patients, none had received aromatherapy relaxation or SSBM therapy. Therefore, based on this background, the title of this study is "The Effectiveness of Aromatherapy Relaxation Techniques and Slow Stroke Back Massage Stimulation on Changes in Pain Intensity in Post-Hydronephrosis Surgery Patients."

METHODS

Study Design

This study used a quantitative research approach with a quasi-experimental design, specifically employing a one group pretest-posttest design. The study aimed to evaluate the effectiveness of aromatherapy relaxation techniques, slow stroke back massage stimulation, and their combination on pain intensity in post-hydronephrosis surgery patients.

Setting

The study was conducted at Amira General Hospital, Purwakarta, Indonesia, from January to July 2024. Data collection was carried out in the inpatient surgical ward.

Research Subject

A purposive sampling technique was used to recruit respondents who met the study criteria.

Inclusion criteria were: (1) post-hydronephrosis surgery patients, (2) conscious and able to communicate verbally, (3) willing to participate in the study, and (4) age $\geq$ 18 years. Exclusion criteria were: (1) patients with unstable vital signs, (2) patients who experienced severe complications after surgery, and (3) patients with impaired cognitive function.

The total sample consisted of 21 respondents, divided into three intervention groups: 7 respondents received aromatherapy relaxation, 7 respondents received SSBM stimulation, and 7 respondents received a combination of both interventions. The sample size was determined based on the study objectives and feasibility considerations of the clinical setting.

Instruments

Pain intensity was measured using the Numeric Rating Scale (NRS), a standardized instrument commonly used in clinical settings to assess pain levels on a scale of 0–10, where 0 indicates no pain and 10 indicates the worst possible pain. The NRS has been widely validated and shown to have good reliability for pain measurement in postoperative patients. An observation sheet was also used to record patient data. No translation or modification of the instrument was required.

 The intervention was carried out by trained nurses.
1. Aromatherapy relaxation technique: 5 drops of essential oil were mixed with 50 ml of water and diffused for 15 minutes in the patient's room.
2. Slow Stroke Back Massage (SSBM): performed for 15 minutes with gentle, rhythmic strokes on the patient's back according to the SSBM protocol.
3. Combination therapy: simultaneous application of aromatherapy relaxation and SSBM stimulation for 15 minutes.
4. Pain intensity was measured before and after each intervention session.

Data Analysis

Data were analyzed using SPSS software. Descriptive statistics were used to summarize respondent characteristics and pain scores. Dependent t-test was used to compare pre- and post-intervention pain intensity within each group. Independent t-test was used to compare differences in pain intensity between groups. A significance level of $p < 0.05$ was considered statistically significant.

Ethical Consideration

The study obtained approval from a university ethics committee prior to data collection under letter number: No.9025/Sket/Ka.Dept/RE/UIMA/VI/2024. All respondents were provided with information regarding the research purpose, procedures, and their rights, and signed informed consent was obtained. Participant confidentiality and anonymity were strictly maintained throughout the study.

RESULTS

Table 1. Characteristics of Respondents Based on Age, Education, Occupation, and Gender

Characteristics	Category	Frequency	
		N/mean	(%)/SD

Age	Nurmreric		49.6	12.6
Education (n,%)	Senior High School		6	28.6
	Elementary School		6	28.6
	Junior High School		5	23.8
	College/University		4	19.0
Occupation (n,%)	Entrepreneur		6	28.6
	Housewife		6	33.3
	Civil Servant		5	14.3
	Private Employee		4	23.8
Gender (n,%)	Male		11	52.4
	Female		10	47.6

Based on the table above, the total number of respondents was 21, with no missing data. All respondents were post-hydronephrosis surgery patients with a mean age of 49.6 years and a median age of 51 years, indicating that half of the respondents were younger than 51 years and the other half were older. The age range of respondents was 21 to 72 years. In terms of educational background, the majority had completed senior high school and elementary school, with 6 respondents (28.6%) in each group. Regarding occupation, most respondents were housewives (7 respondents; 33.3%), followed by entrepreneurs (6 respondents; 28.6%). In terms of gender, the majority of respondents were male (11 respondents; 52.4%).

Univariate Analysis

Table 2. Description of Pain Intensity Scores Before and After Aromatherapy Relaxation Intervention

Therapy	Pain Intensity		N	%
Aromatherapy Relaxation	Moderate	Before	3	42.9
		After	2	28.6
	Mild	Before	4	57.1
		After	5	71.4

Based on the table above, a total of 7 respondents received aromatherapy relaxation therapy. Before the intervention, 3 respondents (42.9%) experienced moderate pain intensity, and 4 respondents (57.1%) experienced mild pain intensity. After the aromatherapy relaxation intervention, the number of respondents experiencing moderate pain decreased to 2 (28.6%), while those experiencing mild pain increased to 5 (71.4%).

Table 3. Description of Pain Intensity Scores Before and After Slow Stroke Back Massage (SSBM) Intervention

Therapy	Pain Intensity		N	%
SSBM Intervention	Moderate	Before	5	71.4

	After	1	14.3
Mild	Before	2	28.6
	After	6	85.7

Based on the table above, a total of 7 respondents received SSBM stimulation therapy. Before the intervention, 5 respondents (71.4%) experienced moderate pain intensity and 2 respondents (28.6%) experienced mild pain intensity. After the SSBM stimulation therapy, the number of respondents experiencing moderate pain decreased to 1 respondent (14.3%), while those experiencing mild pain increased to 6 respondents (85.7%).

Table 4. Description of Pain Intensity Scores Before and After the Combination of Aromatherapy Relaxation and Slow Stroke Back Massage (SSBM) Intervention

Therapy	Pain Intensity		N	%
Aromatherapy Relaxation + SSBM Stimulation	Moderate	Before	6	85.7
		After	0	0
	Mild	Before	1	14.3
		After	7	100

Based on the table above, a total of 7 respondents received the combination of aromatherapy relaxation and SSBM stimulation therapy. Before the intervention, 6 respondents (85.7%) experienced moderate pain intensity and 1 respondent (14.3%) experienced mild pain intensity. After the intervention, the number of respondents experiencing moderate pain decreased to 0 (0%), while those experiencing mild pain increased to 7 respondents (100%).

Bivariate Analysis
Normality Test

Table 5. Shapiro–Wilk Normality Test of Pain Intensity Before and After Aromatherapy Relaxation, SSBM, and Combination Therapy

Pain Intensity	Normalitas	Sig. Shapiro-Wilk
NRS	Aromatherapy Group (Pretest–Posttest)	< .001
	SSBM Group (Pretest–Posttest)	0.099
	Aromatherapy + SSBM Combination (Pretest–Posttest)	0.294

The Shapiro–Wilk normality test showed that the pretest and posttest data of the aromatherapy group had a p-value < 0.001, which is less than 0.05, indicating that the data were not normally distributed. In contrast, the pretest and posttest data of the SSBM group had a p-value of 0.099 (> 0.05), indicating that the data were normally distributed. Likewise, the pretest and posttest data of the aromatherapy and SSBM combination group had a p-value of 0.294 (> 0.05), indicating a normal distribution.

Homogeneity Test

Table 6. Homogeneity Test

Pain Intensity	F	df1	df2	p
NRS Before	0.553	2	18	0.585
NRS After	0.725	2	18	0.498

Based on the table above, the p-value is greater than 0.05, indicating that the data are homogeneous.

Independent T-Test Analysis of Pain Scores in Post-Hydronephrosis Surgery Patients

Table 7. Independent T-Test of Pain Scores with Aromatherapy Relaxation Intervention

Pain Intensity – Aromatherapy Group	n	Mean Difference	p	Effect Size
NRS Pretest vs Posttest	7	2.00	0.371	1.00

Since the normality test showed that the data were not normally distributed, the Wilcoxon Signed-Rank Test was used. The results indicated no statistically significant difference between pretest and posttest conditions in the aromatherapy group (p = 0.372). The mean difference of 2.00 indicates that the posttest pain score was 2 points lower than the pretest score. However, because p > 0.05, it can be concluded that aromatherapy alone did not produce a significant reduction in pain intensity.

Table 8. Independent T-Test of Pain Scores with SSBM Intervention

Pain Intensity – SSBM Group	n	Mean Difference	p	Effect Size
NRS Pretest vs Posttest	7	0.857	0.017	1.24

The results showed a statistically significant difference between pretest and posttest conditions in the SSBM group (p = 0.017), with a mean difference of 0.857 points. Because p < 0.05, it can be concluded that SSBM therapy significantly reduced pain intensity.

Table 9. Independent T-Test of Pain Scores with Aromatherapy and SSBM Combination Intervention

Pain Intensity – Aromatherapy + SSBM Group	n	Mean Difference	p	Effect Size
NRS Pretest vs Posttest	7	2.86	<0.001	2.67

The results showed a highly significant statistical difference between pretest and posttest conditions in the combination therapy group ($p < 0.001$), with a mean difference of 2.86 points. Since $p < 0.05$, it can be concluded that the combination of aromatherapy relaxation and SSBM stimulation produces a very significant reduction in pain intensity compared to either intervention alone.

DISCUSSION

Characteristics of Respondents Based on Age, Education, Occupation, and Gender

Based on the results of this study conducted at Amira General Hospital, there were 21 respondents, all of whom were post-hydronephrosis surgery patients. The respondents' ages ranged from 21 to 72 years. This finding is in line with the study by Ferawati Dakio et al., titled *"Analysis of Determinant Factors of Hydronephrosis Incidence at RSUD Dr. M.M. Dunda Limboto, Gorontalo Regency,"* which showed that hydronephrosis cases were most common in the 20–60 age group, with 54 patients (63.5%), while in the >60 age group there were 31 patients (36.5%) (Faktor et al., 2023).

Age has a strong relationship with pain perception. Younger patients tend to report higher pain levels compared to older patients. Cultural factors may also influence pain reporting; older patients may perceive pain as a natural part of illness and therefore choose not to report it. Studies have shown that pain sensitivity decreases with increasing age, due to physiological, biochemical, and homeostatic changes in somatosensory pathways involved in pain processing and perception. This means older patients may have a higher pain threshold and lower pain discrimination ability than younger patients (Zhi et al., 2024).

Based on educational characteristics, most respondents had completed senior high school and elementary school (28.6% each). Similarly, research by Sumberjaya & Mertha (2020) found that most respondents had a senior high school education (42%) and only 8% had completed elementary school.

Hydronephrosis a condition characterized by kidney swelling due to urinary obstruction or reflux is more closely associated with medical and physiological factors rather than educational background. However, socioeconomic status, which is often linked to education, can influence access to healthcare services, awareness of medical conditions, and the timeliness of treatment, which in turn can affect health outcomes. Previous studies have shown that individuals with lower socioeconomic status may experience delays in diagnosis and treatment due to limited access to healthcare and lower health awareness.

Regarding occupational characteristics, most respondents were housewives (7 respondents). Occupation and daily activities may influence the prevalence of hydronephrosis. Conditions such as kidney swelling due to urinary retention can be exacerbated by physical strain, lack of regular health checkups, and limited health knowledge, which are commonly found in the routines of housewives (Faktor et al., 2023).

Based on gender characteristics, most respondents were male (11 respondents; 52.4%). This is consistent with the study by Alshoabi et al. (2021) titled *"Etiology of Hydronephrosis in Adults and Children: Ultrasound Assessment in 233 Patients,"* which reported that of 233 respondents, 154 were male and 79 were female. This male predominance is supported by

previous research by Ahmed et al., which showed that urinary tract stones—the most common cause of hydronephrosis are more prevalent in men due to hormonal factors.

The high prevalence of hydronephrosis in men is associated with the effect of androgens on lithogenic risk factors, which increase calcium oxalate excretion and deposition in the pelvicalyceal system, leading to stone formation.

The assumption in this study is that hydronephrosis is related to strenuous physical activity without adequate daily electrolyte intake. This is supported by the fact that most respondents with hydronephrosis were male. Men are often less attentive to their personal health, and since more than half of the respondents were working individuals, routine work activities may lead to neglect of proper fluid and electrolyte intake. Although the majority had at least a secondary education, this level of education did not necessarily translate into healthy fluid and electrolyte management habits, leading to an increased risk of kidney problems due to imbalances between physical activity and fluid-electrolyte intake.

Effectiveness of Aromatherapy Relaxation on Changes in Pain Intensity in Post-Hydronephrosis Surgery Patients at Amira General Hospital

Based on the results of the study on the effectiveness of aromatherapy relaxation before and after the intervention, the p-value obtained was 0.372, which is greater than 0.05. This indicates that aromatherapy did not cause a statistically significant reduction in pain intensity. These findings are not consistent with several previous studies, Anasril, Tri Mulyono H (2024) found that lavender aromatherapy effectively reduced pain intensity in patients after open fracture calcaneus surgery. Similarly, Anwar et al. (2018) in their study titled *"The Effect of Lavender Aromatherapy on Pain Intensity Reduction in Post-Cesarean Section Patients"* reported that aromatherapy was effective in reducing pain intensity, with a p-value of 0.000.

The difference between this study and previous research may be attributed to several factors. Not everyone responds to aromatherapy in the same way, as genetic, psychological, and physiological factors can influence its effectiveness. Additionally, the effectiveness of aromatherapy can be affected by individual expectations and beliefs. If a person does not believe in the benefits of aromatherapy, they may not experience the same level of relief as someone who does. Pain itself is often a complex and multifactorial condition, and in some cases, it may require a more comprehensive treatment approach than aromatherapy alone can provide.

The findings suggest that while aromatherapy functions as a complementary therapy intended to promote relaxation, its effectiveness as a standalone intervention for post-surgical pain may vary due to individual physiological responses. Aromatherapy can induce a state of relaxation in the body, allowing patients to respond more adaptively to pain stimuli. Furthermore, aromatherapy may help lower anxiety levels, which can indirectly contribute to a reduction in pain intensity.

Effectiveness of Slow Stroke Back Massage (SSBM) Stimulation on Changes in Pain Intensity in Post-Hydronephrosis Surgery Patients at Amira General Hospital

Based on the results of this study, the p-value for pain intensity before and after the SSBM stimulation intervention was 0.017, which is less than 0.05. This indicates that SSBM

stimulation had a statistically significant effect in reducing pain intensity. These findings are consistent with several previous studies. Research by Rahmawati & Mukhoirotin (2024) titled *"Slow Stroke Back Massage Intervention to Reduce Pain Intensity After Cesarean Section"*, reported a p-value of 0.000, demonstrating that SSBM was effective in decreasing pain intensity. Similarly, a study by Prastianto (2017) titled *"The Effect of Cutaneous Slow Stroke Back Massage Stimulation on Pain Intensity in Elderly Patients with Osteoarthritis"* also showed a significant reduction in pain intensity (p = 0.000).

These results align with Suryani and Fitriyani (2015), who stated that one form of cutaneous stimulation is slow stroke back massage, a gentle back-stroking technique that provides comfort, reduces muscle tension, relaxes the patient, and improves circulation. The mechanism of SSBM involves the release of endorphins, which block pain signal transmission to higher centers in the central nervous system. This is supported by Mander (2004), who explained that massage involves applying manual pressure to soft tissues—such as muscles, tendons, or ligaments—without causing joint movement or changes, with the aim of relieving pain, promoting relaxation, and improving circulation. The main function of massage is considered to "close the gate" to inhibit the transmission of pain impulses. Furthermore, tactile stimulation and the positive sensations produced through gentle and empathetic touch help enhance the analgesic effect of massage (Andarmoyo, 2013).

Mechanistically, SSBM performed on the correct anatomical points is believed to induce comfort by relaxing muscles and tissues, while the tactile stimulation triggers the release of endorphins. This neurochemical response leads to a significant reduction in pain intensity among hydronephrosis patients. In essence, SSBM provides comfort and relaxation after surgery by loosening tight muscles and ligaments, resulting in reduced pain intensity.

Effectiveness of the Combination of Aromatherapy Relaxation and Slow Stroke Back Massage (SSBM) on Changes in Pain Intensity in Post-Hydronephrosis Surgery Patients at Amira General Hospital

The results of this study showed that the combination of aromatherapy relaxation and SSBM produced a p-value < 0.001, which is lower than 0.05. This indicates that the combination therapy caused a highly significant reduction in pain intensity. These findings are consistent with several previous studies. Research by Shelia Fitriani et al. (2023) titled *"Application of Slow Stroke Back Massage and Lavender Aromatherapy to Reduce Chronic Pain in Cervical Cancer Patients"* reported that the first respondent experienced a pain reduction from a scale of 5 to 1, and the second respondent from 6 to 1. This shows that the application of SSBM and lavender aromatherapy can effectively reduce pain levels in cervical cancer patients. Similarly, a study by Setyowati et al. (2019) on *"The Effectiveness of Slow Stroke Back Massage with Lavender Aromatherapy on Pain Reduction in Cervical Cancer Patients at Kariadi Hospital Semarang"* found a significant difference in pain reduction in the intervention group (p = 0.000).

The combination of aromatherapy and SSBM can significantly reduce pain intensity due to several synergistic mechanisms. The combination of massage and aroma creates a rich and calming sensory experience that diverts attention from pain and enhances feelings of comfort and relaxation. When used together, aromatherapy and SSBM amplify each other's

effects. Massage helps facilitate the absorption of essential oils through the skin, while the pleasant aroma enhances the relaxation response. The overall positive and soothing therapeutic experience can improve mood and emotional well-being, contributing to a lower perception of pain.

The assumption in this study is that the use of aromatherapy is strongly recommended as a complementary intervention to reduce pain intensity in hydronephrosis patients. Likewise, SSBM therapy has been scientifically proven to effectively lower pain intensity when massage is performed on the correct anatomical points, resulting in a positive and subjectively perceived effect on patient comfort and pain relief.

CONCLUSION

Based on the results of this study, the characteristics of the 21 post-hydronephrosis surgery respondents showed an average age of 49.6 years, ranging from 21 to 72 years, with a majority being male (52.4%) and most having primary and secondary education (28.6% each). The aromatherapy relaxation intervention showed a decrease in pain intensity from moderate to mild, but the statistical test results were not significant ($p = 0.372$). The Slow Stroke Back Massage (SSBM) intervention showed a significant result ($p = 0.017$) with an increase in the number of respondents in the mild pain category. The combination of aromatherapy relaxation and SSBM produced the most optimal outcome, with all respondents shifting to the mild pain category and a significance value of $p < 0.001$, indicating a highly significant reduction in pain intensity. Therefore, it can be concluded that the combination of aromatherapy relaxation and SSBM is more effective than either intervention alone in reducing pain intensity among post-hydronephrosis surgery patients.

SUGGESTIONS

Based on the findings and conclusions of this study, several recommendations can be made. Theoretically, Amira General Hospital may consider integrating aromatherapy relaxation and slow stroke back massage (SSBM) as complementary therapies in postoperative pain management, supported by standardized operating procedures (SOPs) in medical-surgical nursing care. Practically, these findings can serve as a reference for nursing students in applying complementary therapies and for clinical nurses as an additional intervention for postoperative pain management in patients with hydronephrosis. Scheduling combined therapy sessions is also recommended, as the intervention has been shown to significantly reduce pain intensity. Methodologically, future studies are encouraged to further explore the effects of aromatherapy relaxation and SSBM by including additional variables, controlling anxiety and pain perception factors, and setting inclusion criteria based on mild to moderate anxiety levels to enhance research accuracy and applicability.

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CONFLICTS OF INTEREST

The author declares that there is no conflict of interest regarding the conduct of this research, the writing of the manuscript, or the publication of the findings.

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THE EFFECT OF EDUCATION USING KIA BOOKS ON PREGNANT WOMEN KNOWLEDGE

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ABSTRACT

Background: The trend of maternal mortality in recent years has fluctuated. One way to prevent maternal mortality is to increase the use of KIA books. However, the current KIA books are not being used optimally, so many mothers do not have knowledge about KIA books.

Purpose: To determine the effect of education on the use of KIA books on the knowledge of pregnant women at the Daleman Community Health Center in Sampang Regency.

Methods: This study used a descriptive-quantitative method, with sampling using total sampling. The population of this study consisted of 17 people with a sample of 23 respondents, using a questionnaire instrument with a Wilcoxon test.

Results: The Wilcoxon test showed that the pre-test and post-test values obtained a result of 0.000 with a significance of p (<0.05), which means that the education provided significantly increased the knowledge of pregnant women at the Daleman Community Health Center, Sampang Regency.

Conclusion: The results of the study indicate that education on the use of the KIA book influences the improvement of knowledge among pregnant women at the Daleman Community Health Center in Sampang District. Therefore, it is recommended that education on the Mother and Child Health Handbook be conducted regularly and continuously by health workers, and developed using attractive and easy-to-understand media in order to increase awareness and optimal use of the KIA book among pregnant women.

Keywords: Education, KIA Book, Pregnant Women

BACKGROUND

The health status of pregnant women is an important indicator in determining the quality of medical services in a region. The Maternal and Child Health Handbook serves as a very important communication, information, and education tool for pregnant women, families, and health workers. KIA Handbook is designed to provide comprehensive guidance on maternal health care, childbirth, and child growth and development, thereby supporting efforts to improve the quality of life of families. Globally, maternal mortality rates remain a serious public health issue.

According to the WHO, maternal mortality rates reach 500,000 lives each year worldwide. The ASEAN region, including Indonesia, has a relatively high MMR. Pregnant women's lack of knowledge about the use of the Maternal Health Record Book can hinder routine Ante Natal Care (ANC) recording, early detection of risks, and prevention of pregnancy complications. Low use of the Maternal Health Record Book by mothers independently can have an impact on important decision-making during pregnancy.

The trend shows that the maternal mortality rate in Indonesia is declining, but it is still high compared to other ASEAN countries. Locally, the Sampang District Health Office report recorded an increase in the maternal mortality rate from 12 cases in 2022 to 22 cases in 2023. Based on the 2023 Sampang District MPDN, the MMR in the Kedungdung Community Health Center area reached a total of 3 people, divided into the Kedundung District with 1 maternal death during the postpartum period, the Kedundung District Bato Poro Village with 1 maternal death during the postpartum period, and 1 maternal death during childbirth in Daleman Village, Kedundung District(Agus Mulyadi, 2024a). Meanwhile, in 2024, the MMR in the Kedundung subdistrict was 1 maternal death during childbirth in Daleman Village (Agus Mulyadi, 2024b).

However, in the Daleman Polindes area of Sampang District, the rate of KIA book use by pregnant women is still low. This increase indicates that health promotion and early detection efforts are not yet optimal. A gap was found at the primary service level, where preliminary studies in the Daleman Polindes area showed that of the 10 pregnant women interviewed, most had never read the KIA book because they thought it was only filled out by health workers. Relevant research (Dedy, 2016). shows that the optimal implementation of the KIA Book for pregnant women has only reached 46%, with the main reason being a lack of knowledge and education about its contents.

The results of observations by Sugiati and Kurniadi (2020) in (Wijayanti et al., 2020). concluded that education for pregnant women about the KIA book was only 23.3%. The awareness of the implementation of the MCH book, which is directly supported by the central government, is one of the programs to support maternal and child health, ensuring that health workers are adequately equipped to provide maternal and child health services in accordance with applicable SOPs and perform their duties properly and correctly. It is one of the efforts in providing personal service to mothers, in an effort to maintain health during pregnancy, childbirth, postpartum, immunization, and toddler growth and development, so that it can help facilitate mothers and families, including health workers in monitoring the health history of mothers and children (Suhartini & Rosmiyati, 2021). In order to strengthen the health system in the use of KIA books, the Ministry of Health has issued a policy involving health education institutions as a form of community empowerment in health efforts.

Based on the above background, it is important to conduct research entitled "The Effect of Education on the Use of KIA Books on the Knowledge of Pregnant Women at the Daleman Polindes in Pamekasan Regency." This is based on the fact that pregnant women in the Daleman Polindes area have insufficient knowledge about the use of KIA books, which is one of the factors supporting MMR.

OBJECTIVE

The purpose of this study was to determine the effect of education on the use of KIA books on the knowledge of pregnant women at the Daleman Community Health Center in Sampang Regency, as inadequate understanding and low utilization of the KIA book have been identified as contributing factors to delayed risk detection and the persistently high maternal mortality rates in the region. Therefore, assessing the impact of educational interventions is essential to support efforts in improving maternal health outcomes.

METHODS

Study Design

This study employed a pre-experimental design with a one-group pretest–posttest approach.

Study Subject

Respondents were given a pretest to measure their initial condition before the intervention. The intervention consisted of education on the use of the MCH (KIA) Handbook, followed by a posttest. The study was conducted on February 1, 2025, and the posttest was administered on March 1, 2025, at the Daleman Community Health Center within the working area of the Kedundung Health Center, Sampang Regency. The study population consisted of 17 second and third-trimester pregnant women who underwent antenatal check-ups at the Daleman Community Health Center. A total sampling technique was used, resulting in a sample size of 20 pregnant women.

Instruments

This study used a questionnaire (Sugiyono, 2020). The Researcher used a questionnaire assessment on the use of the KIA Book is designed to measure the extent to which participants understand the meaning, purpose, and contents of the MCH handbook; understand its benefits and how to use it; and are able to apply the information contained therein to support decision-making regarding maternal health. The final score achieved will be categorized ordinally: a Good result indicates mastery between 76% and 100%, a Fair result is in the range of 56% to 75%, and a Poor result is given to participants with an achievement below 56%.

Data Analysis

Data processing was performed using Microsoft Office 2021 and IBM SPSS Version 25 software. The data processing process consisted of editing, coding, and tabulating.

RESULTS
General Data
Table 1. Distribution of respondents based on the age of pregnant women.

Age	Frequency	Percentage
<20 th	4	24%
20-35 th	10	59%
>35 th	3	18%
Total	17	100%

Table 1 shows that most of the respondents studied were aged 20-35 years old, totaling 10 people (59%), while a small number of respondents were aged >35 years old, totaling 3 people (18%).

Table 2. Distribution of respondents based on the education level of pregnant women.

Education	Frequency	Percentage
Elementary School	1	6%
Junior High School	3	18%
High School	12	71%
Higher Education Institution	1	6%
Not in School	0	0%
Total	17	100%

Table 2 shows that most respondents had a high school education, totaling 12 people (71%), and none of the respondents had no schooling, totaling 0 people (0%).

Table 3. Distribution of respondents based on the occupation of pregnant women.

Work	Frequency	Percentage
Working	5	29%
Not Working	12	71%
Total	17	100%

Table 3 shows that most respondents were unemployed (12 people, or 71%), while nearly half of the respondents were employed (5 people, or 29%).

Table 4. Distribution of respondents based on MCH book education

Provision of MCH book education	Frequency	Percentage
Education has been provided	6	35%
Not yet provided with education	11	65%
Total	17	10%

Table 4 shows that most respondents had not received MCH book education, totaling 11 people (65%), while nearly half of the respondents had received MCH book education, totaling 6 people (35%).

Special Data

Table 5. Respondent-specific data prior to education on the use of KIA books in improving the knowledge of pregnant women

Level of Knowledge	Frequency	Percentage
Pretest		
Good	1	5,88%
Enough	4	23,53%
Less	12	70,59%
Total	17	100%

Table 5 shows that prior to education about the use of MCH books, most pregnant women at the Daleman Sampang Polindes were in the poor category, with 12 women (70.59%), while a small number of pregnant women were in the good category, with 1 woman (6%).

Table 6. Specific data on respondents after education on the use of KIA books in increasing the knowledge of pregnant women

Level of Knowledge	Frequency	Percentage
Posttest		
Good	17	100%
Enough	0	0%
Less	0	0%
Total	17	100%

Table 6 shows that the level of knowledge after education about the use of MCH books among pregnant women at the Sampang Daleman Polindes was good for all 17 pregnant women, with a percentage of 100%.

Table 7. Specific data on respondents before and after education on the use of KIA books in improving the knowledge of pregnant women

Variabel	N	Mean Rank	Sum Of Rank	Wilcoxon Statistik	P-Value
Pre test	17	0,00	0,00		
				-3.644	0,000
Post test	17	9,00	153,00		

Based on Table 7, specific data on respondents before and after education on the use of the MCH book in the Wilcoxon signed-rank test conducted on 17 pregnant respondents showed a significant difference between the pre-test and post-test scores. The mean (average rank) score for the pre-test was 0.00, while the post-test score increased to 9.00. These data show that there was an increase in scores after the education was conducted. The sum of ranks for the pre-test was 0.00, while for the post-test it was 153.00, which means that all rank differences were concentrated in the post-test group. The Wilcoxon (Z) statistical value obtained was -3.644, which means that the Z value did not show a decrease but rather showed a significant difference in the direction of an increase. The final P-value was 0.000, which means that this difference is statistically significant ($p < 0.05$).

Table 8. Results of the Wilcoxon Signed Rank Test for pre-test and post-test education on the use of KIA books for pregnant women.

Test Statistics[a]

	Post test - Pre test
Z	-3.644[b]
Asymp. Sig. (2-tailed)	.000

Table 8 shows that before education on the use of the MCH book was provided to pregnant women at the Sampang Polindes, the mean pretest rank was 0.00, while after education was provided, the mean posttest rank was 9.00. The Wilcoxon signed test for the difference between the pretest and posttest knowledge levels of respondents before and after receiving education on the use of the KIA book yielded a significant value of 0.000 ($p < 0.05$).

DISCUSSION

The results of this study indicate that education on the use of the KIA book significantly improves the knowledge level of pregnant women at the Daleman Community Health Center in Sampang District. Data prior to the intervention (pre-test) showed that the majority of respondents had a low level of knowledge, which is consistent with the findings of (Sari, 2017), who also found a high percentage of pregnant women with low knowledge regarding the contents of the KIA book.

This low level of prior knowledge can be attributed to several factors, one of which is employment status and optimization of education (Al farisi & et al, 2021). This study found

that pregnant women who are not employed tend to have greater opportunities to access information (Fajriani R & Sulastri A, 2022). However, the more dominant factor is the suboptimal provision of education about the KIA book. Most respondents admitted that they had not received education, which is in line with the research by (Putri & Sari, 2023) . which emphasized the importance of systematic education in increasing the knowledge of pregnant women. This shows that the routine health information delivery system in these facilities still has gaps, so that the knowledge of pregnant women, which is the basis of good health behavior, is in the poor category.

After the education (post-test), all respondents demonstrated a good level of knowledge. This improvement was supported by the results of the Wilcoxon Signed Rank Test, which showed a significant effect of the educational intervention. These findings reinforce previous literature (Aminatus zahro. F & Arifah . N, 2023), which confirms that providing structured information through the KIA Book can strengthen the capacity and awareness of pregnant women. In addition, the high school education level of the majority of respondents was also a supporting factor for this success, in line with (Rahayu, 2020) and (Ellyda, 2021), who stated that the higher a person's education, the easier it is for them to absorb educational material.

The results of this study are consistent with the findings of the majority of the literature (Nurlaela & Damayanti, 2024) , which states that KIA book - based education is an effective intervention for improving the knowledge of pregnant women. There is a caveat or new insight that emerges from this study, namely the respondents' dependence on health workers when filling out the post-education questionnaire. Although quantitatively the knowledge scores increased dramatically, the assistance of midwives in filling out the questionnaire sheet shows that this increase does not fully reflect independent understanding and internalization of the material. This suggests that a one-time education may not be sufficient to achieve success in terms of independent application or self-efficacy. Measurable knowledge improvement does not necessarily correlate perfectly with sustainable independent behavioral change, which is in line with the findings of (Guantara E & Rahmania S, 2024) that good knowledge is not always followed by good utilization behavior.

The new knowledge that emerged from this study is that although a one-time educational intervention can significantly improve the knowledge scores of pregnant women (as seen from the post-test improvement), it does not necessarily guarantee that mothers will be able to understand and apply the KIA book independently without the help of health workers.

The KIA book education program needs to be developed from a one-time counseling model into continuous coaching that is integrated into every Antenatal Care (ANC) visit. Health workers must ensure that pregnant women fully understand and are able to fill out the KIA book independently, as well as identify danger signs without assistance. For working mothers in particular, an adaptive approach is needed, such as digital media or concise and flexible education sessions.

Thus, the results of this study provide additional insight that efforts to improve the knowledge of pregnant women must go beyond test scores, focusing on transforming knowledge into independent skills for the safety of mothers and babies.

This study has several limitations that need to be considered when interpreting the results and generalizations; the study was conducted in one location (Polindes Daleman, Sampang District). The sample representation was limited to pregnant women in that area, so the generality (external validity) of the results to pregnant women in different geographical or demographic areas may be limited. Despite the increase in scores, the finding that respondents received assistance from health workers when completing the post-test questionnaire may limit the internal validity of the scores produced. This suggests that the post-test scores may be too high (positive bias) and do not fully reflect the respondents' actual and independent level of understanding. This study only measured knowledge immediately after the intervention. The time constraints of the study did not allow for measuring knowledge retention and long-term behavioral changes in pregnant women regarding the use of the KIA book after several weeks or months.

CONCLUSION

This quantitative study confirms that structured educational interventions using KIA book have a very significant effect on improving the knowledge scores of pregnant women at the Daleman Community Health Center in Sampang District. The data show that there was a transformation in the level of knowledge from the majority of respondents in the low category (pre-test) to the good category (post-test), which is supported by significant statistical test results. Theoretically, these findings support the literature that states the effectiveness of KIA book -based education. However, the finding that respondents depended on health workers when filling out the post-intervention questionnaire indicates that the increase in knowledge scores is not fully correlated with the achievement of independence of pregnant women in understanding and applying the KIA book without assistance. Therefore, the substantive conclusion of the study is that although one-time education is effective for increasing knowledge scores, it does not necessarily guarantee the internalization of material for sustainable independent behavioral change.

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CONFLICT OF INTEREST

There are no conflicts of interest in this research

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PEACEFUL END OF LIFE IN LATE-STAGE CANCER PATIENTS: CONCEPT ANALYSIS BY WALKER AND AVANT

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ABSTRACT

Background: The increasing number of malignant cancer patients makes end-of-life care an inseparable element of nursing services. The concept of peaceful end-of-life is very popular , but it is complex and abstract. Understanding the concept of peaceful end-of-life helps professional nurses improve the quality of care outcomes for patients suffering from terminal or life-threatening illnesses.

Objective: The researcher's goal was to clarify and clarify the understanding of the concept of peaceful end-of-life in end-stage cancer patients using the approach of Walker and Avant (2005).

Methods: This concept analysis was conducted using the eight steps proposed by Walker and Avant.

Results: Attributes of peaceful end-of-life in advanced cancer patients include: freedom from pain, a feeling of comfort, acceptance of the disease, and the presence and support of those closest to them. Antecedents, consequences, and empirical referents are explained. Model cases, related cases, threshold cases, and conflicting cases are illustrated to further clarify the concepts.

Conclusion: Four attributes are interconnected and play a role in forming a complete state of peace for terminal cancer patients according to Walker & Avant's analytical approach.

Keywords: Concept Analysis, Peaceful End Of Life, Terminal Cancer

BACKGROUND

End-stage cancer is a condition that not only brings physical suffering, but also causes profound psychological, spiritual, and social stress for patients and their families (Han & Kim, 2025; Puchalski et al., 2019). In the final phase of life (*end of life*), patients often experience anxiety, fear of death, a sense of loss of control, and uncertainty about the future. This condition emphasizes the importance of a holistic approach in health care, especially nursing, to help patients achieve calm and peace towards the end of their lives. One important concept that is the focus of palliative nursing is " *peace end of life* ", namely a state in which patients achieve acceptance, inner peace, and emotional harmony despite being in a terminal condition (Buntari Agustini et al., 2025; D'Andria Ursoleo et al., 2025; Ngabonziza et al., 2021) .

The concept of *peaceful end of life* continues to evolve in nursing, and a comprehensive understanding of its attributes, antecedents, and consequences is necessary to provide appropriate and meaningful interventions. Therefore , concept analysis is a crucial step in clarifying the meaning, boundaries, and key components of *peaceful end of life* , thus providing a basis for developing effective nursing interventions.

Peaceful end of life differs from the concept of *comfort care* . The concept of *peaceful end of life* is not merely free from discomfort, but involves other attributes such as feelings of comfort, appreciation, sincerity/acceptance of the disease condition, and the presence and support of those closest to them. Improving *the concept of peaceful end of life* can be done by providing optimal physical management, including analgesic therapy, providing access to those closest to them, reconciling social and family relationships, spiritual and psychological guidance, providing meaning and *legacy* , and a calm care environment (Delgado-Guay et al., 2016; Smith et al., 2024; Tim et al., 2024) .

The Walker and Avant method is one of the most frequently used concept analysis approaches in nursing because it provides systematic steps for developing conceptual clarity (Gunawan et al., 2023) . Through this method, the concept of *peaceful end of life* can be analyzed in depth, starting from its definition, essential characteristics, antecedent factors, consequences, and the development of a case model that illustrates the application of the concept in nursing practice. This analysis is expected to strengthen the theoretical basis in providing palliative nursing care that is centered on the emotional and spiritual needs of end-stage cancer patients.

OBJECTIVE

This concept analysis aims to clarify the theoretical definition of *peaceful end of life* in patients with terminal cancer and explain the concept comprehensively including antecedents, attributes and consequences, as well as case examples including model cases, threshold cases, related cases and conflicting cases.

METHODS

This concept analysis was conducted using the eight steps proposed by Walker and Avant. The first step involved concept selection; the second step clarified the purpose of the analysis; and the third step identified an overview of all uses of the concept. This included a search of all literature that uses the term " *peace end of life* ," which also assisted in describing

the attributes that define the concept (step four). This process was followed by the development of a model case and additional cases (steps five and six). In step seven, the attributes, antecedents, and consequences of the concept were identified for refinement. In the final (eighth) step, empirical references were selected to determine the attributes that define the concept of " *peace end of life* " (Gunawan et al., 2023; Pranata & Wulandari, 2021).

Concept analysis was conducted to clarify the meaning of the concept of *peace end of life* based on the Walker and Avant method . The search for related concepts in the literature was conducted by searching article data in databases such as PubMed, *Google Scholar* , and *Science Direct* for the period 2010-2025. The keywords used were *peaceful end of life* , *concept analysis* , *support from loved ones* , *acceptance* , *spirituality* , *pain* , *comfort* , and *terminal cancer* . All articles were independently reviewed by members and selected articles related to *peaceful end of life* . The search focused on the terms *peaceful end of life* and terminal cancer. Literature synthesis was used to identify attributes. The use of attributes can be seen in examples of model cases, borderline cases, related cases, and conflicting cases.

RESULTS
Identification of Peaceful End of Life in End-Stage Cancer Patients

Part of Walker and Avant's concept analysis process involves identifying all the concepts used. In the Oxford dictionary, "peace" has the primary meaning of freedom from war or violence, or a state of harmony and tranquility . The Oxford Dictionary also defines "peace" as a state of calm, undisturbed, or undisturbed. "End of life" in a medical/human context refers to the state of approaching death, usually due to old age or prolonged illness (Assefa, 2020) . The use of the concept of *peaceful end of life* can be viewed from various perspectives. From a linguistic perspective, " *Peace* " means tranquility, calmness, or serenity. In medical and spiritual contexts, peace describes a state free from suffering, anxiety, and internal conflict (Xi & Lee, 2021) . From a nursing perspective, *peaceful end of life* refers to the condition of a patient who achieves a state of peace through pain management, emotional support, spiritual guidance, and acceptance of the terminal condition (Ngabonziza et al., 2021; Zaccara et al., 2020) . From a psychological perspective, " *peace end of life"* describes the acceptance phase in Kübler-Ross's theory, where individuals accept death as part of the journey of life (Pasopati et al., 2024) . From a spiritual/religious perspective, *peaceful end of life* refers to a state of surrender, sincerity, fulfillment of worship or prayer needs, receiving spiritual support from religious leaders, and belief in a peaceful transition. (Murni et al., 2025; Wijaya et al., 2022) . Meanwhile, from a family and social perspective, *peace at the end of life* is defined as an atmosphere of intact relationships, forgiveness, resolution of family conflicts, and strong social support (Marco et al., 2005) .

Advanced cancer refers to cancer that has spread from its original location (primary) to other parts of the body (metastasis) or has grown larger and spread to surrounding tissue. This term is also often used to describe cancer that is likely incurable, although some cases can be controlled or cured with treatment. Advanced cancer is often also called metastatic cancer or stage 4 cancer (Welch & Hurst, 2019) .

Attribute definition

Walker and Avant's conceptual analysis process included defining attributes. Four attributes are identified in advanced cancer patients related to the concept of *peaceful end of life* : a physical sense of freedom and adaptability from pain, comfort, acceptance of reality and a sense of peace, and the presence and support of those closest to them.

Cancer doesn't always cause pain, but nearly 80% of metastatic cancer patients report pain. The pain is not solely a consequence of the disease process but is often due to the effects of treatment, radiation, and chemotherapy. Methods used to reduce cancer-related pain are numerous and varied, ranging from powerful pain relievers to interventional procedures to supportive care approaches. Being pain-free doesn't necessarily mean zero pain; it can mean the patient can tolerate pain, feels comfortable, is not disturbed in activities, including sleep, does not cause distress, and has a positive perception of pain management (Welch & Hurst, 2019) .

Comfort in advanced cancer patients is a holistic condition encompassing physical, emotional, spiritual, and social well-being, where patients experience reduced suffering, a sense of security, acceptance of their disease, and the ability to live each day with an optimal quality of life despite being in the terminal phase. Comfort in advanced cancer patients is a multidimensional condition involving physical, psychological, spiritual, social, environmental, and existential factors *(* acceptance and meaning of life). (Edirisinghe et al., 2025; Harrop et al., 2017) .

Acceptance in advanced cancer patients is a psychological condition where the patient is able to accept and accept the fact that he/she has advanced cancer, the patient fully understands and accepts that his/her disease is likely incurable, and integrates this reality into his/her life, attitude and behavior so that the patient is able to live the rest of his/her life calmly, realistically and meaningfully (Babaei et al., 2017; Dekker et al., 2025) .

The presence and support of those closest to you is an important attribute in *a peaceful end-of-life experience* . The presence and support of those closest to you can provide a sense of security and emotional protection. A hug, a touch, or simply the presence of a loved one at your bedside can provide a sense of security and a feeling of not being alone in facing the situation. The presence and support of those closest to you can also strengthen feelings of love and appreciation, and enhance the experience of meaning in life, as you feel a loving connection remains intact until the very end. The process of acceptance *is* also easier to achieve with the presence of those closest to you (Article & Access, 2018; Jimenez et al., 2022) .

Case study

Model case: Mrs. A , a 65-year-old woman, comes from a family where Islamic values grew up in her family. About 10 years ago she was diagnosed with breast cancer. Mrs. A had undergone surgery and chemotherapy. In January, the medical team informed Mrs. A and her family about the progression of her breast cancer, which had metastasized to her liver and lungs. Due to her worsening condition , Mrs. A was referred to a palliative care unit in her hometown . Organ function decline and physical weakness were evident within the first week of treatment. Mrs. A feels comfortable with her condition, this is due to the treatment she received and her self-acceptance of her illness. Mrs. A expressed her desire to actively participate in planning her final separation from her family. Mrs. A wanted to be accompanied by her husband and all her children. Mrs. A wanted her body to be washed by her husband and

children and her funeral procession to be carried out in an Islamic way . Mrs. A asked her family to be buried in the family cemetery next to the graves of her mother and father. Realizing that her family would be sad, Mrs. A helped minimize her family's sadness by building important messages about happiness during life, gratitude for all God's gifts in the midst of her family, sincerity in accepting her illness and hoping for forgiveness of her sins with patience against her illness.

Borderline case: Mrs. B , a 60-year-old woman, comes from a devout family with her husband and four children. About 8 years ago she was diagnosed with breast cancer. Mrs. B had undergone surgery and chemotherapy. In January, the medical team informed Mrs. B and her family about the progression of her breast cancer, which had metastasized to her liver and lungs. Due to her worsening condition , Mrs. B was referred to a palliative care unit in her hometown . Her organ function decline and physical weakness were evident within the first week of treatment. Mrs. B expressed her desire to actively participate in planning her final separation from the family. Mrs. B wants to be accompanied by her husband and all her children. However, her other two children were on national duty and could not accompany their mother in the hospital. Realizing that her family would be sad, Mrs. B helped minimize her family's sadness by making video calls with all her family members, building important messages about happiness during life, gratitude for all God's gifts in the midst of her family, sincerity in accepting her illness and hoping for forgiveness of her sins with patience in dealing with her illness.

Related case: This related case uses a similar concept , but differs from *peaceful end of life* ; it focuses more on *comfort care.* Mrs. C, a 48-year-old woman, lives with her husband and two children who live abroad. About 6 years ago she was diagnosed with breast cancer. Mrs. C had undergone surgery and chemotherapy. In January, the medical team informed Mrs. C of the progression of her breast cancer, which had metastasized to her liver and lungs. Due to her worsening condition , Mrs. C was referred to a palliative care unit in her hometown . Organ function decline and physical weakness were evident within the first week of treatment. Mrs. C reported that her pain level was mild and adaptable. During her hospitalization , Mrs. C became aware of her rapidly deteriorating health and repeatedly expressed her desire to die with her husband and children by her side. However, only her husband was able to accompany her due to her children's busy schedules abroad. Mrs. C died beside her husband, feeling no pain from her illness. However, Mrs. C was unable to fulfill her wish to meet, convey messages, and receive support from her children.

Contrary case : This case is an example of a case that is contrary to the model case that does not define attributes. Mrs. D is a 47-year-old woman who is a single parent with 3 children who live outside the city . About 5 years ago she was diagnosed with breast cancer. Mrs. D had undergone surgery and chemotherapy. In January, the medical team informed Mrs. D of the progression of her breast cancer, which had metastasized to her liver and lungs. Due to her worsening condition , Mrs. D was referred to a palliative care unit in her hometown . Her organ function decline and physical weakness were evident within the first week of treatment. Mrs. D often cried due to physical (pain) and psychological factors, and often uttered statements of hatred towards the conditions she experienced, and felt injustice in her life. During her treatment , Mrs. D realized her health condition was rapidly deteriorating, she also repeatedly

expressed her wish to die accompanied by her husband and children. However, along with the divorce and the presence of her children who were each busy with their own lives, this was difficult to realize. Mrs. D experienced anxiety in the last days of her life. Mrs. D died in a state of denial about her physical condition, not accepting it and unable to fulfill her wish to be able to gather with her family members.

Antecedents

Antecedents are conditions that must occur before *a peaceful end of life* can occur, including: a clear terminal diagnosis (end-stage cancer), adequate pain and symptom management as a basis for achieving peace, open communication between the patient, family, and health workers, consistent spiritual and emotional support, and an empathetic, safe, and non-threatening care environment.

In analyzing the concept of *peace of end-of-life* in terminal cancer patients, a crucial antecedent is a clear, valid, and understandable cancer diagnosis for the patient and family. This clarity of diagnosis triggers emotional and existential responses that lead to acceptance, self-reflection, the search for meaning in life, resolution of emotional burdens, and preparation for *end-of-life* (De Vincenzo et al., 2025) .

Pain in cancer patients is not solely a consequence of the disease process but also a consequence of treatment, radiation, and chemotherapy. Methods used can range from interventional procedures to supportive care approaches. When patients receive pain management therapy, it is hoped that it will reduce or eliminate pain, allowing them to experience a sense of calm and comfort during the *end-of-life process* (Fallon et al., 2018) .

Open communication between patients, families, and healthcare professionals will support the development of comfort care for patients. Open communication also makes patients feel safe and comfortable expressing their emotional needs. Open communication can provide emotional calm and reduce interpersonal conflict in *end-of-life* patients (Danaher et al., 2023; Kwame A & Petrucka P, 2021) .

Consistent spiritual and emotional support enables patients to better understand death as part of God's plan, gaining the strength to form a sense of sincerity and emotional acceptance of the patient, so that the patient feels comfort and acceptance of his/her disease condition (Murni et al., 2025; Sutantri, 2021) .

End-of-life care setting , whether at home, in a hospital, or in a palliative care unit. A safe and comfortable environment ensures physical safety and emotional stability, allowing the patient to focus on the emotional-spiritual process of achieving inner peace (Zadeh et al., 2019).

Consequence

According to Walker and Avant, consequences are events or outcomes that occur after a concept has been reached. The consequences of *a peaceful end of life* for terminal cancer patients include comfort, freedom from pain, acceptance, and support from those closest to them.

Empirical references

Empirical references are indicators that can be measured or observed to determine whether the concept has emerged (Jarvis et al., 2004) . Indicators that can be used to evaluate *peaceful end of life* include: Verbal expressions from patients such as the phrase "I am ready", "I feel peaceful". Patient anxiety can be evaluated with indicators: HADS-Anxiety, ESAS-Anxiety. Patient pain scores can be evaluated with the Numerating Rating Scale, or ESAS-Pain). Patient behavior, such as relaxed facial expressions, better sleep, and reduced anxiety, can be indicators of patient comfort. Increased spiritual activities, such as prayer, meditation, dhikr, and reading holy scriptures, express the patient's spiritual strength and support acceptance, calm, and emotional peace. Having access to and support from those closest to the patient, who accompany the patient during the end-of-life period, demonstrates a strong relationship and open communication between the patient and family.

DISCUSSION

The concept of peaceful end of life describes a state of physical, emotional, spiritual, and social peace and tranquility in terminally ill patients. In terminal cancer patients, this state is characterized by four key attributes: freedom from pain, a sense of comfort, acceptance, and the presence and support of loved ones. These four elements complement each other to create a state of complete peace.

The first attribute, freedom from pain, is the most fundamental aspect in achieving a peaceful end of life. Uncontrolled pain can cause anxiety, sleep disorders, and even spiritual conflict. Therefore, optimal pain management, whether with medication, non-pharmacological techniques, or spiritual support, is key. When pain is reduced, patients are better able to think clearly, interact with their families, and experience a sense of peace (Fallon et al., 2018; Harrop et al., 2017; Ngabonziza et al., 2021; Puchalski et al., 2019).

The second attribute is a feeling of comfort, which includes physical and emotional comfort. Comfort doesn't just mean being free from symptoms like shortness of breath or nausea, but also feeling safe, valued, and treated with dignity. A calm environment, supportive communication, and simple measures like positioning or therapeutic touch can increase comfort. A comfortable environment makes it easier for patients to navigate the final stages more peacefully (Assefa, 2020; Kwame A & Petrucka P, 2021; Ngabonziza et al., 2021).

The third attribute, acceptance, refers to the patient's ability to understand and come to terms with their condition. Acceptance typically develops through internal processes such as reflecting on the meaning of life, mending relationships, or discovering spiritual strength. When patients reach this stage, anxiety decreases and inner calm emerges, which is the essence of a peaceful end of life (Assefa, 2020; Dekker et al., 2025; Sutantri, 2021).

The fourth attribute is the presence and support of those closest to us. Family support, whether in the form of physical presence, touch, loving words, or prayers , provides a sense of security and reduces loneliness. Warm emotional connections help patients feel valued, supported, and less alone in facing the end of life. In conceptual analysis, this support serves as a crucial social foundation for achieving holistic well-being (Danaher et al., 2023; Imtiaz et al., 2020; Sutantri, 2021).

Overall, these four attributes are interconnected and play a role in forming a complete state of peace for terminal cancer patients according to Walker & Avant's analytical approach.

CONCLUSION

The definition, antecedents, attributes and consequences of peaceful end of life in terminal cancer patients have been explored. Further study is needed as the concept develops and its implementation in other cases. This conceptual description is expected to provide a basis for clarifying the theoretical definition of peaceful end of life in terminal cancer patients.

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CONFLICTS OF INTEREST

There is no conflict of interest that needs to be declared by the author in completing this research.

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THE EFFECTIVENESS OF THE HEALTHY MILLENNIAL CARD MEDIA *GAME* IN INCREASING YOUNG WOMEN'S KNOWLEDGE ABOUT ANEMIA PREVENTION

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ABSTRACT

Background: Anemia is a significant public health problem, particularly among adolescent girls in developing countries such as Indonesia. Innovative and interactive health education media are needed to improve adolescents' knowledge regarding anemia prevention. The Healthy Millennial Card Game is an educational tool designed to increase awareness and understanding through participatory learning.

Objective: This study aimed to analyze the effect of health education using the Healthy Millennial Card Game on the knowledge of adolescent girls regarding anemia prevention.

Methods: This study used a pre-experimental design with a one-group pretest–posttest approach. The population consisted of 73 female students, with 62 participants selected using purposive sampling based on inclusion and exclusion criteria. Data were collected using a structured knowledge questionnaire and analyzed using the Wilcoxon test.

Results: Before the intervention, 37 respondents (59.6%) had poor knowledge of anemia prevention. After the intervention, 41 respondents (66.1%) demonstrated good knowledge. Statistical analysis showed a significant improvement in knowledge after the intervention ($p = 0.000$; $p < 0.05$).

Conclusion: Health education using the Healthy Millennial Card Game significantly improved adolescent girls' knowledge of anemia prevention. This interactive educational media can be considered an effective alternative for school-based health education programs to reduce anemia prevalence among adolescents.

Keywords: Anemia, Healthy Millennial Card Game, Knowledge

BACKGROUND

Anemia is a global health problem that deserves attention, especially in developing countries such as Indonesia. Lack of knowledge is one of the factors that contribute to anemia. (Izdihar et al., 2022) Adolescents are an age group at high risk of developing anemia because their iron needs are higher than other age groups. Rapid growth and increased physical activity make adolescent girls ten times more likely to develop anemia than adolescent boys. This is because adolescent girls experience menstruation and therefore require three times more iron than adolescent boys. (Hisanah *et al* ., 2023)

Based on data *from the World Health Organization* (WHO), in 2023 the global prevalence of anemia is half a billion women aged 15-49 years, which means 30% (539 million) of non-pregnant women will be affected by anemia. According to WHO, Africa and Southeast Asia are the most affected regions with an estimated 106 million women and 103 million children affected by anemia in Africa, while in Southeast Asia 244 million women and 83 million children will be affected. Based on data from the Indonesian Ministry of Health in 2024, 32% of adolescents aged 15–24 in Indonesia suffer from anemia.

According to data from the East Java Provincial Health Office in 2020 (East Java Health Office, 2020) , the incidence of anemia in teenage girls in East Java is classified as severe, namely 42% of teenage girls in 10 regencies in East Java have anemia. Based on data from the Kediri Regency Health Office (Kediri Health Office, 2024) in 2023-2024, there were 3,343 teenage girls out of a total of 16,611 who were screened had anemia or around 20.13%. Based on the results of the initial study with interviews with 10 female students in grades VII, VIII & IX of the YBPK Sidorejo Christian High School conducted by the researcher, it was found that 6 people stated that they often experienced symptoms of weakness, fatigue, lethargy, in addition, the female students also stated that they did not know about anemia and did not understand the symptoms of anemia, headaches and lethargy, while 4 people experienced symptoms of anemia, headaches, dizziness. The students stated that they had known about anemia but did not understand the symptoms and causes of anemia.

Anemia in adolescents has a significant negative impact on health and quality of life. Adolescents who suffer from anemia tend to experience decreased physical and cognitive abilities, resulting in difficulty concentrating, frequent fatigue, tiredness, lethargy, and dizziness, which can interfere with their productivity. Furthermore, factors that influence the occurrence of anemia include a lack of willingness to seek and explore information about the symptoms, causes, and prevention of anemia. A study conducted by (Kusnadi, 2021) showed that a factor that influences anemia is knowledge. Adolescent girls who have good knowledge about anemia tend to have a lower risk of developing anemia. Meanwhile, adolescent girls who have less knowledge about anemia tend to have a higher risk of developing anemia. This shows a relationship between knowledge and the risk of anemia in adolescent girls. One way to increase adolescent girls' knowledge about anemia is to provide health education to minimize the risk of worsening anemia. A study conducted by (Styaningrum & Metty, 2021) showed that education using *a healthy millennial card game* about anemia prevention proved effective in increasing adolescent girls' knowledge.

OBJECTIVE

This study aimed to examine the effect of health education using the Healthy Millennial Card Game on adolescent girls' knowledge of anemia prevention. Specifically, this research sought to evaluate changes in knowledge levels before and after the educational intervention, considering the high prevalence of anemia among adolescents and the identified gaps in their understanding of anemia symptoms, causes, and prevention. By utilizing an interactive and participatory educational approach, this study is expected to provide evidence on the effectiveness of innovative learning media as an alternative strategy for improving health knowledge and supporting anemia prevention programs among adolescent girls in school settings.

METHODS

Study Design

This research uses a quantitative approach and the study design that will be used is *pre-experimental design* with *one group pre-test-post-test.*

Study Subject

The sample used in this study was based on inclusion criteria, namely respondents willing to sign *Informed Consent* and exclusion criteria, namely respondents who were not present at the time of the study such as: illness and permission, with a calculation using the Slovin formula, totaling 62 respondents. The sampling technique in this study was *purposive sampling.*

Instruments

The first measuring tool used in this study was the collection of sociodemographic data using a questionnaire covering (age, gender, first menstruation) to measure knowledge related to anemia among adolescent girls using *the Healthy Millennial Card Game (KMS)* , which is a card containing questions and answers related to anemia and balanced nutrition. The questions in *the KMS Game* have been adjusted to statements that have passed the validity and reliability tests of the anemia knowledge questionnaire. The KMS card contains 15 questions containing the definition of anemia, diagnosis of anemia, causes of anemia, symptoms of anemia, short-term and long-term effects of anemia, reasons why adolescent girls are susceptible to anemia, ways to prevent anemia, foods to prevent anemia and foods that trigger anemia.

Intervention (this title is for experimental studies only)

[1]Form small groups of 10-11 by counting 1-6, young women are given a pre-test before treatment. [2]Teenage girls are grouped according to number, [3]Each group will be divided into groups A and B consisting of A1, A2, A3 who will hold 15 question cards. while groups B1, B2, B3 hold 15 answer cards so that there are 6 groups. [4]The game in the card will be played by 2 groups in turns, namely group A holds the question card and is answered by group B by showing the answer card, and vice versa. [5]The group that gets the highest score is the group that answers the most questions correctly. [6]The group that gets the highest score will receive a reward as motivation. [7]*The healthy millennium card game* is carried out once a day for 60

minutes. *Post-testing* was conducted 1 week after the intervention by administering a questionnaire.

Data Analysis

Data analysis in this study used SPSS 16 software to describe gender data, first menstruation . Frequency distribution and percentage were used. Meanwhile, knowledge was presented in the form of average. median, minimum-maximum value. For further analysis, to determine the difference between the pre-test and post-test mean values because the data was not normally distributed, the Wilcoxon test was performed with a significance value (p value < 0.005).

Ethical Considerations

This research involves human participants, the procedures given to respondents have been approved and stated in accordance with the procedures and ethical standards of the Health Research Ethics Committee (KEPK) of Stikes Husada Jombang with number 01008-KEPKSHJ. All participants in this research have received explanations and expressed their willingness to sign the consent that has been given.

RESULT

Table 1. Distribution of responden of the age of female students

No	Age	Frequency	Percentage (%)
1	11-12 years old	2	3.2%
2	13-14 years old	39	62.9%
3	15-16 years old	21	33.9%
	Total	**62**	**100%**

Based on table 5.1 above, almost all respondents were aged 13-14, which was 39 (62.9%) female students.

Table 2. Distribution of respondents based on the level of menstrual age

No	Menstrual Age	Frequency	Percentage (%)
1	10-12 years old	27	43.5%
2	13-14 years old	35	56.5%
3	15-16 years old	0	0%
4	Not Menstruating Yet	0	0%
	Total	**62**	**100%**

Based on table 5.2 above, it shows that almost all respondents experienced menstruation at the age of 13-14 years, which is a total of 35 (56.5%) female students.

Table 3. Distribution of respondents based on the information about anemia prevention of female students

No	Information about Anemia Prevention	Frequency	Percentage %
1	Once	0	0%
2	Never	62	100%
	Total	**62**	**100%**

Based on table 5.3 above, it shows that all respondents have never received information about anemia prevention, namely 62 (100%) female students.

Table 4. Distribution of knowledge related to anemia prevention before being given the healthy millennial card game to teenage girls .

No	Knowledge	*Pre-Test*	
		Total	Percentage %
1	Good	0	0%
2	Enough is enough	25	40.3%
3	not enough	37	59.6%
	Total	**62**	**100%**

Based on table 5.4, it shows that before being given the game, *the results of* the healthy millennial cards show that 0 respondents (0%) had good knowledge, 25 respondents (40.3%) had sufficient knowledge, and 37 respondents (59.6%) had insufficient knowledge .

Table 5. Distribution of knowledge related to anemia prevention after being given the healthy millennial card game to teenage girls .

No.	Knowledge	*Post-Test*	
		Total	Percentage %
1	Good	41	66.1%
2	Enough is enough.	21	33.8%
3	not enough	0	0
	Total	**62**	**100%**

Based on table 5.5, it shows that after being given *the healthy millennial card game* , the results showed that 41 respondents (66.1%) had good knowledge, 21 respondents (33.8%) had sufficient knowledge, and 0 respondents (0%) had insufficient knowledge.

Table 6. Result *of the Wilcoxon signed rank test* before and after being given the healthy millennial card game

Variable	N	Median (min-max)	Mean ± SD	p-value
Knowledge				

Pre-test	62	53(27-77)	54.37±12.531	0.000
Post-test	62	80(60-93)	81.06±10.929	

Based on table 5.6, it shows that knowledge about anemia prevention before the healthy millennial card *game was played had a mean value of* 54.37 with a minimum value of 27 and a maximum of 77. After being given the healthy millennial card game *, the mean value* was 81.06 with a minimum value of 60 and a maximum of 93. The *mean difference* between *the pre-test* and *post-test* was 26.69.

Based on the results *of the Wilcoxon signed rank test* , *p* = 0.000 where *p* <0.05 so that H1 is accepted means that there is an influence of health education through the media of *healthy millennial card games* on the knowledge and attitudes of teenage girls towards anemia prevention .

DISCUSSION

Based on the results of data analysis using *the Wilcoxon test,* it shows that the test results or analysis results from the *Wilcoxon statistical test* obtained *Sig. (2-tailed)* or probability value (0.000) which is much lower than the significant standard of 0.05 or ($\rho < \alpha$), then the H1 data is accepted, meaning that there is an Influence of Health Education Through the Media *of Healthy Millennial Card Games* on the Knowledge and Attitudes of Adolescent Women Towards Anemia Prevention .

Previous research by (Styaningrum & Metty, 2021) explained that providing a planned intervention *for the healthy millennial card game produced good results. Health education through the healthy millennial card game* can generate many ideas and opinions and can share various information in groups, thus motivating and encouraging interest in learning among female students. Better learning outcomes can help adolescents achieve optimal health levels from previously unknown to knowledgeable. The results of the study showed an increase in respondent knowledge after the healthy millennial card *game was played with a p value* (0.000) < alpha value (0.05). This indicates that there is a difference in anemia prevention in adolescent girls before and after the healthy millennial card *game* was played. Therefore, it can be concluded that *the healthy millennial card game* is effective in increasing knowledge about anemia prevention among adolescent girlS.

This research is also supported by a study conducted by (Efri Susanti Mesi et al., 2024) that health education is effective in increasing awareness and understanding of adolescents regarding early anemia prevention. And based on the results of statistical tests of the difference in knowledge before and after being given health education about anemia prevention using the *pre-experimental design method with a one-group pre-test and post-test design approach* model , the bivariate p value is 0.000, so it can be concluded that there is an influence of health education on adolescent girls' knowledge about anemia prevention.

From the analysis above, there is an influence of health education through the media of the *healthy millennial card game* on the knowledge and attitudes of teenage girls about anemia prevention . Based on the results of the researcher's observations, the respondents have the willingness and awareness that arises in female students in accepting *the healthy millennial*

card game about anemia prevention provided by the researcher, which is a new learning method for teenage girls so that female students can increase their knowledge about anemia prevention.

CONCLUSION

Significant influence of health education through the *Healthy Millennium Card Game Media* on Female Adolescents' Knowledge About Anemia Prevention with the results of *Sig. Value (2-tailed)* $0.000 < α (0.05)$ means that it has a strong level of proximity. Providing health education through *the Healthy Millennium Card Game Media* as a stimulant in an effort to increase students' knowledge in preventing early anemia. This can be seen when *the game* has started, they are very enthusiastic to answer every question from the card. Until the process begins with stimulation, occurs based on concentration of attention, there is a thought processing process in the right brain that can increase imagination and creativity, the *Healthy Millennium Card Game* which is an interactive discussion allows for variations in the level of participation, respondents have the willingness and awareness that researchers are looking for new learning methods for female adolescents, so that their students can prevent anemia, so that their students can prevent anemia emerged in students in receiving the healthy millennial card *game* about preventing anemia given

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CONFLICT OF INTEREST

No Conflict of Interest

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THE RELATIONSHIP BETWEEN DIETARY ADHERENCE AND RANDOM BLOOD GLUCOSE LEVELS IN TYPE 2 DIABETES MELLITUS PATIENTS AT THE ANGGREK ELDERLY POSYANDU UNDER THE WORKING AREA OF BULULAWANG HEALTH CENTER

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ABSTRACT

Background: Elevated blood glucose levels are indicative of type 2 diabetes mellitus, a metabolic disease. Glycemic stability is largely determined by dietary compliance, a crucial non-pharmacological treatment.

Purpose: To determine how elderly clients with type 2 diabetes mellitus at the Anggrek Wellbeing Center in the Bululawang Community Health Center service area relate to random blood sugar levels and adherence to diet.

Methods: A descriptive correlational quantitative technique and a cross-sectional strategy were used in this study. 54 elderly people with type 2 diabetes from the Anggrek Old Health Center comprised the study sample. This was obtained by use of the entire sampling approach. Diet compliance was measured using the PDAQ questionnaire, while blood sugar levels were measured using a glucometer. The relationship between the two variabels was analyzed using Pearson's test.

Results: Most participants had moderate to good dietary adherence (38.9% each), while 22.2% exhibited poor adherence. More than half of participants (57.4%) had normal RBG levels, while 42.6% had high levels. Dietary adherence and RBG showed a high and significant negative connection (r = –0.907, p = 0.000), suggesting that lower blood glucose levels were linked to improved adherence.

Conclusion: Dietary adherence is essential for individuals with Type 2 diabetes in order to control their blood sugar levels at random. Strengthening dietary education and continuous monitoring is essential

Keywords: Diabetes Mellitus Type 2, Dietary Compliance, Elderly, Random Blood Glucose

BACKGROUND

Type 2 diabetes mellitus (T2DM) is a chronic non-communicable metabolic disease characterized by elevated blood glucose levels due to impaired insulin secretion, insulin resistance, or a combination of both. According to the International Diabetes Federation (IDF, 2025), this disease develops progressively and often remains asymptomatic in its early stages. As a result, many new cases are diagnosed only after serious complications have occurred, such as cardiovascular disease, nephropathy, neuropathy, retinopathy, and diabetic ulcers. (PERKENI, 2021) states that delayed diagnosis and suboptimal management contribute to an increased risk of complications and reduced quality of life among patients. Therefore, type 2 diabetes mellitus is recognized as a "silent killer" and poses a significant challenge in healthcare services.

The prevalence of type 2 diabetes mellitus has increased significantly worldwide. The (IDF, 2025) reported that the number of people with diabetes reached 589 million in 2024 and is projected to rise to 853 million by 2050. The World Health Organization (WHO, 2022) explains that most cases are closely associated with lifestyle changes, particularly diets high in sugar and fat combined with low physical activity. In line with this, (Assyakurrohim et al., 2022) noted that the transition to modern lifestyles is a major factor contributing to the increasing incidence of T2DM. These findings indicate that diabetes management remains a serious public health problem.In Indonesia, type 2 diabetes mellitus has also shown a meaningful increase and is one of the leading causes of morbidity. According to the (IDF, 2025), Indonesia ranks among the ten countries with the highest number of diabetes cases worldwide, with over 19 million individuals affected. (PERKENI, 2021) emphasizes that T2DM significantly contributes to the rising incidence of cardiovascular disease, kidney failure, and other chronic complications. The high burden of this disease highlights the need for more focused management efforts, particularly through lifestyle modification and dietary control. Such approaches are especially crucial for vulnerable populations, such as the elderly.

Elderly individuals are at high risk of developing type 2 diabetes due to physiological changes associated with aging. The (WHO, 2022) notes that decreased insulin sensitivity and altered body composition in older adults affect glucose metabolism. Additionally, (PERKENI, 2021) mentions that the elderly often experience physical limitations and cognitive decline, which can affect their ability to manage chronic diseases. (Ding et al., 2024) further add that these conditions increase the risk of blood glucose instability in older adults. Therefore, diabetes management in this population requires special attention.

Random blood glucose (RBG) is one of the indicators commonly used to assess glycemic control in patients with type 2 diabetes, particularly at primary healthcare and community levels. (Luscombe-Marsh et al., 2023) state that RBG testing is practical and easy to perform in routine monitoring. (PERKENI, 2021) explains that elevated RBG levels reflect suboptimal glycemic control and are associated with an increased risk of complications. Moreover, (Arisandi et al., 2020) found that fluctuations in RBG among older adults are often influenced by dietary patterns and adherence to prescribed diets, highlighting the importance of dietary management in controlling blood glucose levels.

Dietary adherence is a fundamental pillar in managing type 2 diabetes mellitus, alongside pharmacological therapy and physical activity. (PERKENI, 2021) emphasizes that

dietary management should follow the "3J" principle: type, amount, and timing of food intake. (Aisyah, 2022) states that non-adherence to dietary recommendations can lead to increased blood glucose levels and accelerate complications. Conversely, (Kuwanti et al., 2023) reported that good dietary adherence helps stabilize blood glucose and improves quality of life in diabetic patients. Therefore, dietary adherence plays a critical role in T2DM management.

Previous studies have demonstrated the relationship between dietary adherence and blood glucose levels in patients with type 2 diabetes. (Rahmatiah et al., 2022) and (Khasanah et al., 2021) found that poor dietary adherence is significantly associated with elevated blood glucose levels. However, most of these studies were conducted among working-age populations and in formal healthcare settings. (Arisandi et al., 2020) highlighted that studies focusing on older adults at the community level are still limited. Additionally, the use of random blood glucose as an indicator of glycemic control in older adults has not been widely explored, indicating a research gap.

Preliminary studies at the Anggrek Elderly Posyandu under the Bululawang Health Center revealed that some elderly individuals with type 2 diabetes mellitus do not adhere to dietary recommendations. This condition is accompanied by considerable fluctuations in random blood glucose levels among some respondents. (PERKENI, 2021) notes that dietary non-adherence at the community level is often influenced by long-standing eating habits. Furthermore, (IDF, 2025) emphasizes the importance of local data as a basis for planning interventions. Therefore, this study was conducted to analyze the relationship between dietary adherence and random blood glucose levels in elderly individuals with type 2 diabetes mellitus at the Anggrek Elderly Posyandu under the Bululawang Health Center.

OBJECTIVE

To determine how elderly clients with type 2 diabetes mellitus at the Anggrek Wellbeing Center in the Bululawang Community Health Center service area relate to random blood sugar levels and adherence to diet.

METHODS

Study Design

The present study employed a cross-sectional methodology and was quantitative in nature with a correlational descriptive design.

Setting

This study was conducted at the Anggrek Elderly Health Center in East Java, which is part of the operational area of the Buluawang Community Health Center.

Research Subject

The study was conducted on November 13-15, 2025. Data collection was conducted door-to-door with all respondents. The total number of respondents was 54, all of whom were elderly people diagnosed as having type 2 diabetes mellitus who were registered and actively participating in activities at the Anggrek Elderly Health Center. Total sampling, which included all population members who satisfied the requirements, was the sampling strategy used in this investigation.

Instruments

Tools to test blood sugar levels and tools to evaluate diet compliance were the two kinds of instruments employed in this investigation. The Perceived Diet Adherence Questionnaire (PDAQ), which was taken from (Abidin's, 2018) research (Asaad et al., 2015), was the tool utilized to measure diet compliance levels. Meanwhile, blood sugar levels were measured using a Yuwell glucometer, with the results recorded in mg/dL. This tool is utilized to acquire objective data regarding the glucose levels of participants during data collection.

Data Analysis

The degree and direction of the relationship between RBG levels and dietary compliance were analyzed using Pearson's relationship analysis. A statistically sigmportant p-value is less than 0.05. SPSS was used for the statistical analysis, which made it possible to calculate correlations and descriptive statistics accurately. Mean, standard deviation, and frequency distribution were used in descriptive analyses for RBG levels, dietary adherence scores, and demographic traits. Since both variables are continuous and normally displayed, they meet the requirements for parametric correlation analysis, and Pearson's correlation is selected.

Ethical Consideration

The ethics agreement obtained from ITSK Dr. Soepraoen Malang Hospital, which is licensed to issue ethical review latters, ensures that all procedures comply with ethical standards in research involving human participants. The local posyandu authority provided comprehensive written approval in order to adhere to public health management rules. The participants were reminded of confidentiality, that participation was completely optional, and that they might withdraw at any time without fear of consequences. Participants' privacy and ethical compliance were maintained throughout the research by not disclosing any information that may be used to identify them.

RESULTS

Table 1. Distribution Based on Respondent Age

Age	Frequency	Percentage (%)
60	4	7.4
61	5	9.3
62	6	11.1
63	1	1.9
64	2	3.7
65	4	7.4
66	1	1.9
67	5	9.3
68	3	5.6
69	4	7.4
70	6	11.1
71	2	3.7
72	2	3.7
73	4	7.4
74	3	5.6
75	2	3.7
Total	**54**	**100.0**

The 54 responders' ages varied from 60 to 75 years, which is within the older adult (≥60 years) group according to the World Health Organization (WHO, 2022). The most dominant age groups were 62 and 70 years (11.1% each), followed by 61 and 67 years (9.3%). Ages 63 and 66 had the smallest representation with only one respondent each (1.9%). Overall, the age distribution indicates that the majority of respondents fell within the early to middle range of older adulthood. This may influence their physical condition, perception of illness, and experience

Table 2. Frequency Distribution of Characteristics Respondents (n=54)

Gender	Frequency	Percentage (%)
Male	28	51.9
Female	26	48.1
Total	**54**	**100.0**

The sample consisted of 28 male participants (51.9%) and 26 female participants (48.1%). This nearly balanced distribution indicates that both genders were proportionally represented, minimizing the possibility of gender bias in the analysis.

Table 3, Distribution of Marital Status

Marital Status	Frequency	Percentage (%)
Married	35	64.8
Divorced	4	7.4
Widow/Widower	15	27.8
Total	**54**	**100.0**

Most respondents were married (64.8%), while 27.8% were widowed or widowers, and 7.4% were divorced. Most elderly patients with Type 2 Diabetes Mellitus have a spouse, according to these studies, who can help them manage their chronic condition emotionally and socially. Conversely, respondents without partners may have different levels of support in adhering to diabetes management.

Table 4. Distribution Based on Religion

Religion	Frequency	Percentage (%)
Islam	51	94.4
Christian	3	5.6
Total	**54**	**100.0**

The majority of respondents were Muslim (94.4%), while the remaining 5.6% were Christian. This distribution reflects the demographic composition of the Bululawang region. Although religion is not directly associated with blood glucose levels, it may influence dietary habits and cultural practices relevant to diabetes management.

Table 5. Characteristics of Respondents Based on Education

Education Level	Frequency	Percentage (%)
Elementary School	33	61.1
Junior High School	10	18.5
Senior High School	7	13.0
No Formal Education	4	7.4
Total	**54**	**100.0**

Most respondents had an elementary school education (61.1%), while 7.4% had no formal education. This distribution indicates that the majority had low educational attainment, which may affect their understanding of health information, including dietary adherence and diabetes management. Lower educational levels are often associated with challenges in health literacy.

Table 6. Characteristics of Respondents Based on Occupation

Occupation	Frequency	Percentage (%)
Private sector employee	1	1.9
Entrepreneur	1	1.9
Farmer	11	20.4
Laborer	10	18.5
Unemployed/Retired	31	57.4
Total	**54**	**100.0**

More than half of the respondents were unemployed or retired (57.4%), consistent with the age group studied. Farmers (20.4%) and laborers (18.5%) comprised a substantial portion of the working respondents. The majority being retired suggests that most respondents no longer engage in routine physical activity associated with employment, which may affect their lifestyle patterns and glycemic control.

Table 7. Distribution Of Dietary Compliance Among Patients with Type 2 Diabetes Mellitus

Dietary Adherence	Frequency	Percentage (%)
Poor	12	22.2
Moderate	21	38.9
Good	21	38.9
Total	**54**	**100.0**

Most respondents demonstrated **moderate (38.9%)** or **good (38.9%)** dietary adherence. However, 22.2% still showed poor adherence. This indicates that although many elderly individuals follow dietary recommendations, a notable proportion still struggles with consistent adherence. Such non-adherence may contribute to poor glycemic control. The findings highlight the ongoing need for targeted nutritional education and regular monitoring to improve dietary compliance among older adults with T2DM.

Table 8. Distribution of Random Blood Sugar in Patients with Type 2 Diabetes Mellitus

RBG Category	Frequency	Percentage (%)
Normal	31	57.4
High	23	42.6
Total	**54**	**100.0**

More than half of the respondents (57.4%) had normal RBG levels, while 42.6% exhibited high levels. This indicates that although many elderly individuals have achieved adequate glycemic control, a substantial percentage still experiences elevated blood glucose. Factors such as dietary adherence, physical activity, medication compliance, and comorbidities may influence these outcomes.

Table 9. Normality Test

Category	Unstandardized Residual
N	54
Asymp. Sig. (2-tailed)	0.200

To determine if the residuals were normal, the Kolmogorov–Smirnov test was used. The residuals were found to be normally distributed, since the resultant Asymp. Sig. value of 0.200 was greater than the significance threshold of $\alpha = 0.05$. This satisfies one of the key assumptions of parametric correlation analysis, ensuring the validity of subsequent statistical testing.

Table 10. Cross tabulation

Dietary Adherence	Normal RBG	High RBG	Total
Poor	0	12	12
Moderate	10	11	21
Good	21	0	21
Total	**31**	**23**	**54**

The crosstabulation results revealed a clear relationship between dietary adherence levels and RBG categories. Respondents with poor dietary adherence were entirely in the high RBG category (100%). Among those with moderate adherence, the distribution was mixed, with 10 having normal RBG and 11 having high RBG. Notably, all respondents with good dietary adherence had normal RBG levels (100%). These findings indicate that higher dietary adherence is strongly associated with better glycemic control, while poor adherence is linked to elevated RBG levels.

Table 11. Correlation Between Diet Compliance and Random Blood Sugar in Type 2 Diabetes Patients

Variable	GDS	TOTAL
GDS	1	-0.907
Sig. (2-tailed)	—	0.000
N	54	54
TOTAL	-0.907	1
Sig. (2-tailed)	0.000	—
N	54	54

RBG levels (GDS) and the TOTAL variable showed a very high and statistically significant negative association ($r = -0.907$, $p = 0.000$) according to the Pearson correlation test. Higher RBG levels are closely linked to worse dietary adherence ratings, according to this negative connection. In contrast, blood glucose levels that are lower and more steady are associated with greater dietary adherence ratings. The strength of this correlation highlights the importance of dietary compliance in managing blood sugar levels in older adults affected by Type 2 Diabetes Mellitus.

DISCUSSION

Dietary Adherence among Elderly Patients with Type 2 Diabetes Mellitus.

This study found that most elderly participants exhibited moderate to good dietary adherence, with 21 respondents (38.9%) categorized as having good adherence and 12 respondents (22.2%) classified as having poor adherence. Variations in adherence levels are related to cognitive decline often experienced by the elderly, such as memory impairment and difficulty understanding and remembering dietary instructions for patients with type 2 diabetes mellitus. These conditions make it challenging for older adults to maintain consistent eating patterns in accordance with diabetes dietary recommendations.

Biological factors also play a role in influencing dietary adherence and glycemic control. (Shang et al., 2024) explained that increased visceral fat is associated with insulin resistance and a decreased ability of the body to regulate blood glucose levels. This finding aligns with the current study, which shows that visceral obesity can worsen glycemic control in patients with type 2 diabetes mellitus. Moreover, the use of the PDAQ instrument in this study proved useful in systematically assessing dietary adherence among elderly individuals with type 2 diabetes mellitus.

The clinical implication of these findings highlights that dietary adherence among the elderly requires special attention through continuous education and monitoring. Therefore, healthcare professionals, particularly community nurses, should actively provide dietary education tailored to the cognitive abilities of the elderly to help maintain long-term adherence.

Random Blood Glucose Level in Type 2 Diabetes Mellitus Patients.

The results of this study showed that 23 respondents (42.6%) had elevated random blood glucose (RBG) levels, while the majority, 31 respondents (57.4%), had RBG levels within the normal range. This condition may be influenced by metabolic changes commonly occurring in older adults, such as decreased insulin sensitivity and impaired glucose regulation. (Ding et al., 2024) explained that the aging process reduces the body's ability to maintain glucose homeostasis, making the elderly more susceptible to fluctuations in blood glucose levels.

In addition to biological factors, RBG control is also influenced by dietary patterns and adherence to diabetes diets. (Arisandi et al., 2020) reported that elderly individuals with good dietary adherence are more likely to achieve normal RBG levels. (Shang et al., 2024) also emphasized that blood glucose instability in older adults is often affected by visceral fat accumulation, which disrupts insulin sensitivity and glycemic control.

The clinical implication of these findings suggests that RBG testing can serve as a simple and practical indicator for monitoring glycemic control in elderly patients with type 2 diabetes mellitus. Routine RBG assessments at elderly posyandu can assist healthcare professionals in the early detection of blood glucose instability and in evaluating the effectiveness of dietary management.

The Relationship Between Diet Compliance and Random Blood Sugar in Patients with Type 2 Diabetes Mellitus.

The analysis revealed a highly significant relationship between dietary adherence and random blood glucose levels (r = −0.907; p = 0.000). This extremely high correlation should be interpreted critically, as it may be influenced by the relatively homogeneous characteristics of the sample, where all respondents were elderly patients with type 2 diabetes from a single healthcare service area with similar disease management patterns. All respondents with good dietary adherence had RBG levels within the normal range, while all respondents with poor adherence fell into the high RBG category. The clear separation of categories between dietary adherence and RBG may contribute to the magnitude of the correlation coefficient obtained. These findings support previous research by (Arisandi et al., 2020), which indicated that adherence to dietary patterns significantly affects blood glucose control in patients with type 2 diabetes. (Rahmatiah et al., 2022) also reported that dietary non-adherence is a major contributor to elevated random blood glucose levels in patients.

Furthermore, (Khasanah et al., 2021) emphasized that glucose stability can be achieved through proper control of the quantity, type, and timing of meals. In elderly patients with type 2 diabetes mellitus, the relationship between dietary adherence and RBG levels is clearly evident due to physiological and metabolic changes associated with aging. In addition, the high correlation value may also be influenced by uncontrolled confounding variables, such as adherence to pharmacological therapy, physical activity levels, and duration of diabetes, reflecting real-world conditions in community healthcare settings.

The clinical implication of these findings underscores the importance of routine monitoring of dietary adherence in elderly patients with type 2 diabetes mellitus, as it has been shown to be strongly associated with RBG control. Based on these results, healthcare professionals, particularly nurses at elderly posyandu and primary healthcare services, are encouraged to actively monitor diet, provide ongoing dietary education, and involve family members in supporting dietary adherence to prevent diabetes-related complications.

CONCLUSION

Because cognitive function, glucose metabolism and insulin sensitivity all decline in old age, seniors who do not follow a diet tend to consume foods high in sugar and simple carbohydrates, which immediately raise blood glucoses levels while the body's ability to control sugar has already declined. As a result, dietary compliance affects blood sugar levels in older adults. Resesrch findings clearly demonstrate this: all older adults with good dietary compliance have normal random blood sugar, while those with poor dietary compliance have elevated blood sugar levels.

ACKNOWLEDGMENTS

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THE EFFECT OF TELENURSING IMPLEMENTATION ON THE QUALITY OF LIFE (QoL) OF PATIENTS WITH CHRONIC DISEASES: A SYSTEMATIC REVIEW

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ABSTRACT

Background: There are still differences in access to health services in Indonesia in the current digital era because conditions show that rural residents, especially those living in border areas, experience obstacles in obtaining health services and the prevalence of chronic diseases has increased, with hypertension rising from 25.8% to 34.1%, diabetes mellitus rising from 6.9% to 8.5%, stroke prevalence rising from 7% to 10.9%, and chronic kidney disease rising from 2% to 3.8%.

Purpose:The purpose is to determine the effect of telenursing implementation on the quality of life of patients with chronic diseases.

Methods:The method applied is a systematic review referring to the PRISMA guidelines, articles for the last 5 years, subject area, nursing, relevance, article types, and were selected to be analyzed and assessed using JBI.

Results:The research findings indicate that nine studies were taken from 1,373 publications. Publications were taken from the period 2021 to 2025. Research articles were searched through academic electronic databases (Scopus, Pubmed, and Google Scholar). The implementation of telenursing has positive implications for the quality of life of patients with chronic diseases.

Conclusion: Telenursing has shown positive results in improving the hope of improving the quality of life of patients with chronic illnesses. The variety of media and applications used in the implementation of telenursing also contributes to its success. It is hoped that further research will further examine the factors influencing the implementation of telenursing and also research can be conducted on the same media.

Keywords: Chronic Disease, Quality Of Life, Telenursing.

INTRODUCTION

The disparity in access to healthcare facilities and services between urban and rural areas remains a challenge for the Indonesian government. Patients with chronic illnesses require ongoing care, and one or two visits are not sufficient. This leads to increased costs for accommodation and transportation, especially for patients living far from healthcare centers. (Setiawan et al., 2020). The World Health Organization (WHO) defines quality of life as a person's personal view of their place in life, within the context of the culture and values that surround them, and in relation to their aspirations, expectations, norms, and concerns. According to the WHO, health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity. Therefore, it is important to remember that any health problem affects not only the physical but also all other dimensions of an individual's health (Septiani et al., 2022). Nurses have a very important role in providing health services (Fadhilah et al., 2024). Therefore innovation is very necessary, one of which is telenursing which allows nurses to provide nursing services to patients remotely using information technology and web-based systems (Erna et al., 2025).

Telenursing is one of the latest information and communication technology systems in the healthcare sector that enables the delivery of nursing services or care remotely. In other words, patients and nurses interact not directly but through media that can be used by the patient and their family (Setiawan et al., 2020). Telenursing is a process that involves providing, managing and regulating services and delivering health services by utilizing information and communication technology (Fitriani & Mulyono, 2022). Implementation of telenursing can take the form of utilizing websites, social media platforms, telephones, mobile phones, and interactive videos to provide care to patients (Fitriani & Mulyono, 2022).

Other implementation methods that can be used are outpatient care, telephone center services, telenursing triage, telenursing discharge planning, consultation using a secure messaging system, consultation via a hotline service, and audio or video sessions between patients and nurses (Setiawan et al., 2020). Telenursing can also provide nursing care and consultations to patients through electronic platforms, which contributes to increasing access to care, improving the quality of life, and in addition, with telenursing, nursing services can reach more people (Fadhilah & Bili, 2025). The immediate benefits include more effective use of time and money. The scope of nursing services is expanding with the advent of telenursing (Amanah & Herawati, 2022).

Data shows that there are 70,000 cases of chronic diseases that end in death, most of which are caused by people's lifestyles that favor fast food and experience stress. It is predicted that by 2030, approximately 150 million people will suffer from chronic diseases. The prevalence of chronic diseases has increased, with hypertension rising from 25.8% to 34.1%, diabetes mellitus rising from 6.9% to 8.5%, stroke prevalence rising from 7% to 10.9%, and chronic kidney disease rising from 2% to 3.8% (Adiwisastra et al., 2025). Supported by previous research, regarding the impact of telenursing on patients with chronic kidney disease (CKD), with the support of data CKD is ranked 9th as a cause of death in America with an estimated more than 100,000 people with end-stage CKD died in 2016. Meanwhile, in Indonesia the death rate of CKD patients undergoing dialysis was 1,243 people. This study found that in the intervention group before the intervention the majority had a poor quality of

life and after the intervention there was an improvement, namely the majority had a good quality of life. The results of this study are supported by the results of a study on quality of life measurements by Soelistyoningsih, & Wira (2019) which stated that the quality of life is categorized as good >60.0 and poor ≤60.0 with the result that 63.3% of patients have a good quality of life (Gultom et al., 2021). Telenursing is an innovation in the information and communication technology sector, which facilitates supervision, allowing healthcare providers to assess health conditions remotely, provide educational interventions, or provide health and social services to patients at home (Zuliatika & Purnamawati, 2024).

Providing nursing services remotely by utilizing communication tools or telenursing not only helps clarify the medical evaluation of patients, but also places greater emphasis on the level of urgency and duties of nurses, so that nurses can concentrate more on information and improving patient understanding (Ballsy et al., 2021). In such situations, telenursing is seen as a solution to improve the situation. The public can access healthcare services in a more practical and affordable manner, thereby improving the quality of health and well-being. With telenursing, nurses can reach more patients and provide personalized healthcare, anytime, anywhere, even at the patient's home (Fadhila & Afriani, 2020). Based on the background above, the aim of this systematic review is to explain and present the influence of telenursing on the quality of life of patients with chronic diseases.

METHODS

Design

In a systematic review conducted through P.R.I.S.M.A., keywords such as telenursing, quality of life, and chronic disease were used to search for authoritative sources. The population was patients with chronic diseases in various countries. The intervention was the implementation of telenursing through various media. The results of this study were the effect of telenursing on the quality of life of patients with chronic diseases. Researchers identified relevant databases for searching these studies using PubMed, Scopus, and Google Scholar. The keywords "telenursing," "quality of life," and "chronic disease" were used.

Search Methods

Included: Inclusion criteria, which stipulated originality, publication in English, and alignment with the research objectives. Search Results: In a systematic review conducted through P.R.I.S.M.A., keywords such as "telenursing," "quality of life," and "chronic disease" were used to search for authoritative sources.

1. Systematic Review Process Flowchart
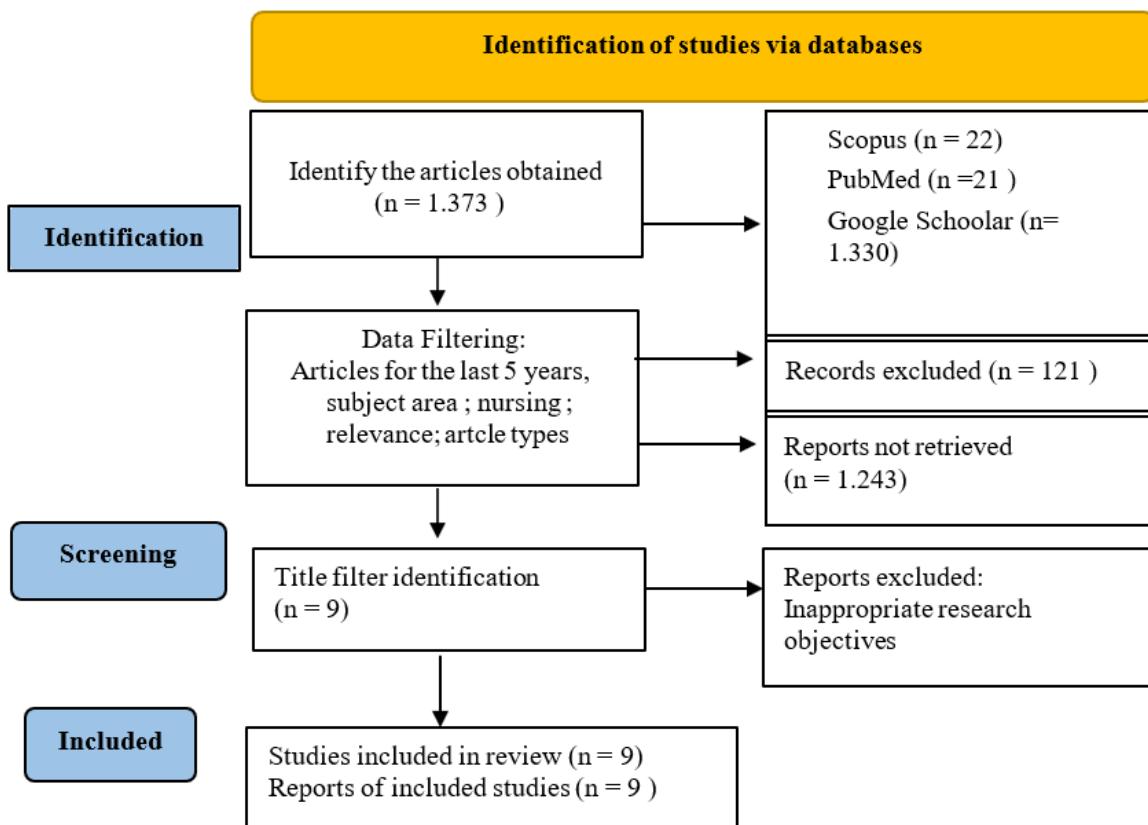
Figure 1.
PRISMA Algorithm

Quality Appraisal

Of all the articles included in the library, the article identification process was carried out for 1,373 articles, then the filtering process with data filtering: Articles for the last 5 years, subject area, nursing, relevance, article types, and obtained 1,243 articles and the next filtering process was to review and record the full text of articles with similar themes as many as 130 articles, of the 130 articles were validated with the criteria of articles that have themes according to the selection included and valid as many as nine articles. From this study, nine articles were selected to be analyzed and assessed using JBI, and following the PRISMA guidelines.

Data Abstraction

The valid data is then extracted and synthesized, then analyzed and compiled

Data Analysis/ Synthesis

The valid data in the form of a table and calculated as a percentage of the existing theme.

RESULTS

Tabel 1. List of Articles

N o	Tittle & Author	Aimed	Result
1.	Efficiency of an mHealth App and Chest-Wearable Remote Exercise Monitoring Intervention in Patients With Type 2 Diabetes: A Prospective, Multicenter Randomized Controlled Trial (Li et al., 2021)	aimed to determine the efficiency of exercise using a fitness app and heart rate band to remotely monitor patients with type 2 diabetes in comparison with that of traditional exercise.	It is known that the intervention group experienced an increase in cardio pulmonary system endurance and a decrease in body fat compared to the control group.
2.	The Effect of Telenursing on Disease Outcomes in People with Type II Diabetes Mellitus (Faezeh et al., 2024)	aimed to evaluate the effects of telenursing compared to routine care on disease outcomes in people with T2DM.	The findings indicated that telenursing or nurse-led telephone follow-up significantly increased self-care efficacy scores, improved adherence to treatment regimens, and reduced levels of glycosylated hemoglobin and plasma glucose. However, no significant effects were observed on lipid profiles or body mass index. Quality of life also improved compared to routine care.
3.	Mobile App for Gynecologic Cancer Support for Patients With Gynecologic Cancer Receiving Chemotherapy in China: Multicenter Randomized Controlled Trial (Lin et al., 2023)	The aim of this study was to examine the efficacy of a mobile app for gynecologic cancer support (MGCS) for patients with gynecologic cancer receiving chemotherapy in China.	The MGCS program demonstrated efficacy in supporting patients with gynecologic cancer receiving chemotherapy. This trial illustrates that an app-based program can be incorporated into routine care to support patients with cancer and suggests that allocation of more resources (grants, manpower, etc) to mobile health in clinics is warranted.
4.	Effectiveness of telehealth on the glycemic control of patients with type 2 diabetes mellitus during the COVID-19 pandemic: A systematic review and meta-analysis of randomised controlled trials (Chiaranai et al., 2024)	This study aimed to examine the impact of telehealth on the glycemic control of in dividuals with type 2 diabetes mellitus during the pandemic.	In our review, we showed telehealth's positive impact on glycaemic control in type 2 diabetes mellitus patients. Healthcare professionals can use telehealth in diabetes care. Caution is needed due to heterogeneity of the results. Further research should explore the long-term impacts of telehealth interventions.
5.	Examining the	aims to synthesize	The impact of mHealth on the QoL

N o	Tittle & Author	Aimed	Result
	influence of mHealth interventions on quality of life among individuals living with HIV or hypertension: A systematic narrative review (James et al., 2025)	existing definitions, frameworks, facilitators and barriers to scaling-up health innovation in low-middle-incomecountries (LMICs)	of people with HIV showed a spectrum from positive to neutral, influenced by factors such as technology used and patient demographics. For hypertensive patients, mHealth interventions generally improved QoL, although some studies reported neutral impacts. Key trends highlighted the importance of personalization and user engagement in correlating with improved QoL outcomes.
6.	Role of Telemedicine in Inflammatory Bowel Disease:Systematic Review and Meta-analysis of Randomized Controlled Trials (Pang et al., 2022)	aimed to compare the impact of telemedicine with that of standard care on the management of IBD.	Telemedicine intervention showed a promising role in improving IBD-specific QoL among adolescents and decreased the number of clinic visits among patients with IBD. Further research is warranted to identify the group of patients with IBD who would most benefit from telemedicine.
7.	Telehealth care and remote monitoring strategies in heart failure patients: A systematic review and meta-analysis (Masotta et al., 2024)	To synthesize evidence related to the impact of telemonitoring strategies on mortality and hospital readmissions of heart failure patients.	Sixty-one studies were included in the review. Narrative synthesis of data suggests a trend towards a reduction in deaths among monitored patients, but the number of rehospitalized patients was higher in this group. Meta-analysis of studies reporting one-year all-cause mortality outlined the protective power of care models based on telemonitoring in reducing one-year all-cause mortality. Meta-analysis of studies reporting the number of rehospitalized patients in one-year outlined that telemonitoring is effective in reducing the number of rehospitalized patients when compared with usual care strategies.
8.	Telenursing in the postoperative period: a scoping review (Maria et al., 2024)	to map available evidence on telenursing use in the postoperative period and its impact on patient outcomes.	Of the positive outcomes, we highlight improved levels of disability, autonomy and quality of life, lower rates of post-operative complications, pain and reduced costs. Telephone monitoring was the most widely used modality, but there were few studies in the pediatric context and in Brazil. of the studies, 11 (91.6%) identified at least one positive outcome in

N o	Tittle & Author	Aimed	Result
			telenursing use and none showed negative aspects in the postoperative period.
9.	The impact of education through nurse-led telephone follow-up (telenursing) on the quality of life of COVID-19 patients (Raesi et al., 2021)	This study was conducted to determine the impact of nurse education and telephone follow-up (telenursing) on the quality of life of COVID-19 patients.	Telenursing improves the life quality of COVID-19 patients. Through appropriate policies, health managers may put on the agenda the implementation of telenursing for COVID-19 patients

Based on the articles obtained, research findings showed that telenursing, using various media or applications as interventions, has shown improvements in the quality of life of patients with chronic illnesses. Other research findings presented in several systematic review articles also indicate positive outcomes on patients' quality of life.

DISCUSSION

This study examined all media and methods used in implementing telenursing. Furthermore, the chronic disease sample was not specific, encompassing all patients with chronic illnesses. Therefore, this study cannot specifically indicate which method is most effective. However, a review of the articles found indicates that all media used demonstrated positive results. This is supported by several previous studies, strengthening the finding that telenursing has a positive impact on the quality of life of patients with chronic illnesses. Telenursing is defined by the International Council of Nurses (ICN) as activities in nursing care, teaching, management, and research conducted remotely using electronic means (Marques, 2022). Telenursing typically refers to healthcare services delivered through various types of ICT systems, ranging from email, telephone, chat, or text messaging to computer-based video conferencing, remote monitoring, diagnosis, or remote applications requiring advanced technology. Telenursing offers three benefits: for patients, nurses, and healthcare institutions. For patients, telenursing supports them and their families in managing their chronic illnesses, providing them with the right information and support online, and reducing distance and travel time (Nasition et al., 2023).

Another study showed that telenursing had no significant impact on the quality of life of heart failure patients, but there were significant changes in self-care management. One type of telenursing that did not impact the quality of life of heart failure patients was telephone monitoring (Amanah & Herawati, 2022). Other studies also suggest that these findings may be influenced by various factors, including routine monitoring of medication adherence, encouraging regular visits to cardiologists, providing recommendations regarding activity levels appropriate to the patient's physical and mental abilities, and facilitating open communication between patients and researchers during the intervention phase. There were significant differences in various aspects of quality of life after the intervention between the control and intervention groups. The intervention impacted various aspects of quality of life, which is consistent with the findings of this study. Another study showed that telephone

counseling conducted by nurses resulted in improved outcomes for the quality of life of patients with cardiovascular disease (Mahvar, 2025).

Telehealth interventions have been shown to be effective in improving blood glucose control in people with type 2 diabetes mellitus, as evidenced by significant reductions in glycated hemoglobin and improvements in other outcomes. The superior effectiveness of telehealth interventions compared to conventional care can be attributed to several factors. First, the use of advanced technology has significantly contributed to the development and widespread acceptance of telehealth. Telehealth utilizes communication technologies, such as video conferencing, remote monitoring devices, text messaging, and mobile health applications to provide health-related services and information. This technology enables the collection and transmission of health data, facilitates interactions between patients and healthcare providers, and supports the delivery of care remotely. Without this advanced technology, the implementation and delivery of telehealth services would be impossible (Chiaranai et al., 2024). Supported by research, telenursing offers health education and direct instruction on health issues from nurses to patients and their families. Furthermore, the use of telenursing also empowers nurses to provide remote care with the ability to monitor, follow-up, gather information, and provide multidisciplinary services such as remote interventions, pain management, and family support in creative ways. Follow-up is one aspect of the mental health care process. By implementing telenursing (telephone follow-up), patients need continuous monitoring of their ability to cope with their illness and learn how to change their lifestyles in an efficient manner, despite limitations in terms of human resources, time, and costs compared to conventional methods. Through the telephone, nurses can identify patients' needs and help them meet them. This approach can alleviate patients' stress, anxiety, and depression, increase their self-confidence, and move patient care from the healthcare facility to their homes (Purwanti & Katmini, 2023).

Telenursing is a new strategy that, during the pandemic, can help the healthcare system both cost-effectively (effective use of funds) and for public health (improving patients' quality of life). Thus, it can be said that telehealth services can support care for patients with chronic diseases and improve their quality of life by providing accurate and useful information (Nazari et al., 2024).

CONCLUSION

This study reveals the impact of telenursing implementation on the quality of life of patients with chronic illnesses. Several studies have demonstrated positive outcomes from telenursing implementation, including increased patient resilience and improved quality of life for patients with chronic illnesses. The variety of media and applications used in telenursing implementation, such as mobile apps and phone calls, also contributed to its success. Future research is expected to further explore the factors influencing telenursing implementation in patients with chronic illnesses and also research can be conducted on the same media.

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INNOVATION OF MATERNITY PILLOW DESIGN WITH LAVENDER AROMATHERAPY ON SLEEP QUALITY OF PREGNANT WOMEN IN THIRD TRIMESTER

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ABSTRACT

Background: Good sleep quality plays an important role in maintaining maternal health during pregnancy and providing sufficient energy for labor. However, physiological changes such as increased uterine size, physical discomfort, and elevated progesterone levels often lead to sleep disturbances in pregnant women, particularly in the third trimester. One effort to improve maternal sleep quality is by increasing comfort through an innovative maternity pillow design equipped with lavender aromatherapy.

Purpose: This study aimed to develop a maternity pillow design integrated with lavender aromatherapy as a supportive intervention to improve sleep quality among pregnant women.

Methods: This study employed a pre-experimental method using a one-group pre–post test design and a research and development (R&D) approach. The R&D stages included literature review, system and product design, product development and manufacturing, expert validation, system testing, and analysis. Sleep quality was assessed using a structured questionnaire. The research was conducted over a one-year period.

Results: The findings showed that maternal self-efficacy increased from 41 before the intervention to 59.8 after the intervention, with a p-value of 0.000 (p≤0.05), indicating a significant influence of the Android-based application intervention "cakoASI.id" on the self-efficacy of breastfeeding mothers.

Conclusion: The evaluation results indicated that the Maternity Pillow Design was categorized as very high, effectively improved sleep quality among third-trimester pregnant women, and was feasible and successfully tested in the field.

Keywords: Design, Lavender Aromatherapy, Maternity Pillow, Sleep Quality, Third-Trimester Pregnant Women.

BACKGROUND

Pregnancy is a physiological process that begins from conception to birth. Pregnancy involves rapid physical and psychological changes in pregnant women, requiring a long adaptation period, especially in the third trimester. A mother experiences anxiety related to the labor process, uncomfortable sleeping positions, active fetal movements at night, fear of pain and physical dangers that will arise during labor, worry about the mother and baby being born abnormally, and dreams that reflect her concerns and worries. This can disrupt the mother's sleep quantity (Ayudia et al, 2022). Ideally, pregnant women should get at least 7.5 hours of sleep (Lestari & Maisaro, 2019).

Various studies report that the prevalence of sleep disorders varies widely, ranging from 30 to 78% of all pregnancies (Phan, 2022). Specifically, studies report that 68% of women experience serious sleep disturbances, including frequency, decreased sleep hours (8.1 to 7.5 hours), and poor sleep quality, especially during the third trimester (Beebe, 2017). A survey of 2,427 pregnant women found poor sleep quality (76%), insomnia (57%), nighttime awakenings (100%), and sleep-disordered breathing (19%) from early to late pregnancy (Mindell & Nikolovski, 2015).

During pregnancy, changes in normal sleep waves and fragmentation occur (Silva-Perez, 2019; Bazalakova, 2017). However, changes in sleep can lead to significant health and cardiovascular problems such as hypertension, an increased risk of preeclampsia, and fetal developmental delays (Hasan Zaky, 2015). Disturbed sleep patterns caused by poor sleep quality also have long-term consequences, such as insomnia, nighttime awakenings, parasomnias, vertigo, and even psychological disorders such as emotional distress, anxiety, fatigue, and depression (Christian, 2019). Good sleep quality will maintain maternal health during pregnancy and provide sufficient energy for labor. This impacts normal physiological changes during pregnancy, such as increased uterine size, physical discomfort, and increased progesterone levels.

Sedative-hypnotic and antidepressant medications, which are widely used in clinical interventions for sleep disorders, are certainly not suitable for pregnant women due to various side effects on pregnancy and the fetus, drug tolerance, dependence, abuse, and decreased cognitive function (Her & Cho, 2021). Therefore, non-pharmacological treatments are the main alternative. One widely recommended therapy is aromatherapy. Aromatherapy is a complementary alternative therapy that can be self-administered due to its simplicity, low cost compared to visiting a professional, and proven to provide rapid effects (Meihartati & Iswara, 2021). The recommended aromatherapy is lavender. Lavender has been shown to contain neurochemicals. Lavender flowers contain linalool, which has sedative and calming properties. It stimulates cilia receptors in the olfactory nerve, transmitting a pleasant aroma to the olfactory bulb via the olfactory bulb (Jafari-Koulaee, 2020).

This study uses maternity pillow media because pillows are media that are often used when someone sleeps, where the pillow will be closer to the human sense of smell so that the aromatherapy pillow media someone will automatically inhale the aromatherapy and also aromatherapy pillows are very effective as a therapy media to deal with sleep quality disorders because someone who will sleep will definitely use a pillow. Maternity pillows have a special design to support the stomach and support the back. The recommended position for pregnant

women in the third trimester is the left side sleeping position, right side, and using a pillow support pillow under the waist which can provide comfort to the mother, and provide optimal benefits to the fetus that obtains maximum blood flow and nutrition through the placenta (Ratnasari & Karina, 2019).

Riswanto et al.'s 2021 study, entitled "Lavender therapy pillows affect sleep quality in the elderly." The results showed a P-value of 0.000 (P-value <0.005), indicating a significant effect of lavender aromatherapy pillows on sleep quality in the elderly in Kragilan, RT 03/RW 13, Banjarsari Village, Surakarta City (Riswanto et al., 2021). In this study, the pillows designed were regular pillows equipped with lavender aromatherapy. Ratnasari's 2019 study, entitled "Pillow support on the right side of pregnant women on the incidence of supine hypotension in pregnant women in the third trimester," showed a p-value of 0.005, indicating a significant relationship between pillow support and supine hypotension in pregnant women. This study concluded that the use of special pillows for pregnant women can reduce maternal disorders in the form of supine hypertension (Riswanto et al., 2021). Based on previous research on aromatherapy pillows, researchers concluded that there are no pillows specifically designed for pregnant women designed with the addition of complementary aromatherapy. While existing maternity pillows still need further development to further improve maternal sleep quality, current maternity pillows tend to be monotonous in shape and design.

Based on basic data from the Padang City Health Office in 2022, there were 17,376 pregnant women in Padang City Community Health Centers, including Nanggalo Community Health Center and Andalas Community Health Center. The number of pregnant women at Andalas Community Health Center was 1,486 (Health Office, 2022). The number of pregnant women at Andalas Community Health Center in 2023 was 171.

OBJECTIVE

This study aims to design an innovative lavender aromatherapy maternity pillow that implements complementary therapy to increase maternal relaxation.

METHODS

Study Design

This research uses a research and development (R&D) approach, namely building and designing a system that is applied in the health sector.

Setting

This research was conducted in the on Juni-November 2024.

Research Subject

This research focuses on maternity pillow product design activities, the activities are described as follows:

1. Literature Study

    The initial stage of developing a project-based science learning model began with a needs analysis. This analysis was conducted through literature review and interviews with pregnant women. These interviews were conducted to obtain information about the Lavender Aromatherapy Maternity Pillow Design, the challenges encountered, and the potential benefits of supporting the Lavender Aromatherapy Maternity Pillow Design for pregnant women.

2. Designing a maternity pillow

The design process began with research into pillowcase materials, color, shape, thickness, weight, and aromatherapy. The design was crafted with meticulous and precise attention to ergonomic principles, allowing for further manufacturing, such as using a 3D printer.

3. Implementation of maternity pillow manufacturing

   The design will be made by a tailor, with aromatherapy innovations added.

4. Product Trial and Evaluation

   The maternity pillows that have been created will be tested for their suitability by experts in the field. Validation is carried out by administering a questionnaire to the experts. Based on the questionnaire, suggestions, comments, and constructive feedback are obtained, which are used to improve the maternity pillow model.

5. Analysis

   The tested products are then analyzed and subjected to small-scale product trials on pregnant women.

RESULTS

1. Results of Needs Analysis (Analyze)

   The initial stage of developing a project-based science learning model begins with a needs analysis. The needs analysis conducted in this study aims to obtain information from experts and pregnant women regarding the Innovation of Maternity Pillow Design with Lavender Aromatherapy on Sleep Quality of Pregnant Women in the Third Trimester. The needs analysis was conducted through literature studies and interview techniques given to pregnant women. These interviews were conducted to obtain information about the Maternity Pillow Design with Lavender Aromatherapy, the obstacles faced and the potential to support the Maternity Pillow Design with Lavender Aromatherapy for pregnant women.

   a. Pillow and Pillowcase Material

   Pillow material was chosen because, based on discussions with pillow makers and users, and based on research conducted by Jeon et al. (2014), it was found that different pillow materials impact sleep quality differently. Pillow material factors were then divided into outer pillow material and pillow filling material.

   b. Product Color

   Color is known to influence the psyche. Therefore, colored paintings or objects can have an emotional impact. One study found that certain colors can affect a person's sleep quality. Therefore, it is crucial to choose a pillowcase color that can ensure a good night's sleep.

   c. Product Shape and Thickness

   Pillow shape was chosen because, based on research conducted by Liu et al. (2011), it showed that pillow shape affects sleep quality. Pillow thickness was also chosen because, based on research conducted by Ren et al. (2016), it showed that different pillow thicknesses provide different sleep quality.

   d. Product Weight

   Pillow weight was not chosen because pillow weight does not affect sleep quality. In research conducted by Sinaga et al. (2014), it was found that pillow weight plays a role

when used in specific situations. The pillow used in this study weighed 2 kilograms, so pillow weight was used as a signal factor in determining sleep quality.

2. Results of the Maternity Pillow Design Concept Design

The Maternity Pillow has original dimensions of 120 cm x 80 cm x 15 cm (Length x Width x Height). This design was created with careful and precise attention to ergonomic principles so that it could be followed up to the manufacturing stage using 3D images. The steps for implementing the Maternity Pillow design concept model are explained as follows:
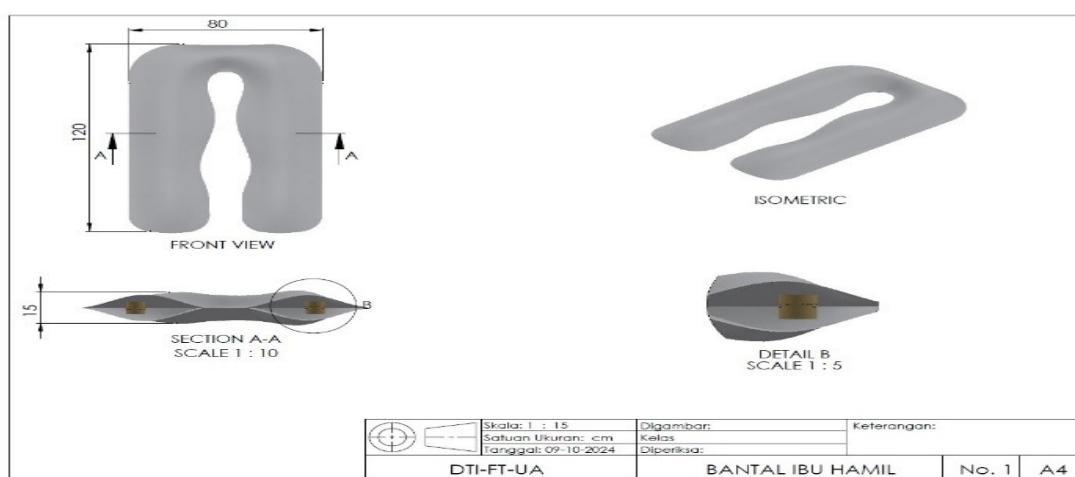
3. Data Analysis of Expert Validation Results

Table 1. Expert Validation Result Data

No	Rated aspect	score	Score/Total Score x 10	Mark	Criteria
1.	Product Material and Pillowcase	43	9,0	A	Very good
2.	Product Color	7	7,0	B	good
3.	Product shape and thickness	8	8,0	A	Very good
4.	Product weight	10	7,3	B	good
	All aspects	68	8,0	A	Very good

Based on the table, the value of each aspect is obtained, such as (1) the aspect of material and pillowcase with a score of 9.0 with a value of A with good criteria (2) the

color aspect obtained a score of 7.0 with a value of B with good criteria (3) the aspect of shape and thickness of the product scored 8.0 with a value of A and included in the very good criteria (4) the aspect of product weight obtained a score of 7.3 with a value of B and included in the good criteria. In addition to the value of the results of product validation, suggestions and comments were also obtained to improve the color of the product. The suggestion is to clarify the color of the product, namely the project planning stage, the implementation stage and the presentation stage. Overall, the results of the expert assessment of the product contained in the Maternity Pillow Design received a score of 68 which is included in the very high category. So it can be stated that the product in the Maternity Pillow Design is suitable for use in improving the sleep quality of pregnant women in TM III, so the product is said to be worthy of being tested in the field.

4. Product Trial Results

Table 2. Data from the results of the Pregnant Women's Response Questionnaire in a Small-Scale Trial

No	Rated aspect	score	Score/Total Score x 10	Mark	Nilai	Criteria
1.	Product Material and Pillowcase	123	41	8,1	A	Very good
2.	Product Color	22	7,3	7,3	B	good
3.	Product shape and thickness	24	8	8	A	Very good
4.	Product weight	35	11,7	7,8	B	good
	All aspects	204	68	8	A	Very good

Based on the table above, the overall results of the small-scale maternity pillow design questionnaire received a score of 8, with an A rating, which is considered very good. The pregnant women's questionnaire not only provided an assessment but also provided comments and suggestions that were used to improve the developed model. Among the suggestions and comments provided were to make the product color more attractive and vibrant.

DISCUSSION

Testing certainly determines the product's success in addressing sleep disorders and improving maternal comfort and sleep quality. According to the Great Indonesian Dictionary, comfort is a state of ease, freshness, and coolness. Sleep is a process of changing a person's state of consciousness that occurs repeatedly over a period of time (Potter & Perry, 2017).

Meanwhile, according to Chopra (2003), sleep is a state of mutually exclusive relaxation, where the body rests peacefully and metabolic activity decreases, while the brain works harder during dreaming periods compared to daytime activities. Based on these definitions, sleep comfort can be defined as the state of comfort experienced when the body is at rest and consciousness changes. Sleep comfort can be assessed based on thermal comfort and sleeping posture.

Several previous studies have designed pillows for different purposes. This research is supported by research by Cai & Chen (2016), which examined the creation of pillow design concepts using an ergonomic approach. The pillow design concept aims to improve sleep quality. This study presented four studies: investigating the natural sleeping positions of 40 subjects aged 17-36 to obtain key points for pillow design; measuring body dimensions related to pillow design in 40 subjects to determine pillow size; creating pillow designs based on previous studies; and assessing the sleep quality of six subjects using the pillow designs compared to their current pillows. The results of study 1 revealed four natural sleeping positions.

Liu et al. (2011) conducted a study to determine the relationship between pillow design and subjective comfort levels. Four pillow designs were combined into eight configurations, which were then tested for their comfort level. The test was conducted by asking subjects to lie on each of the eight pillow configurations for one minute each. They were then asked to compare the comfort levels of pillows 1 and 2, 1 and 3, and so on. Thirty subjects (16 men and 14 women) participated. Pillow configuration 4 was the most comfortable pillow, with regard to head, neck, and shoulder comfort, height, and overall comfort. The four pillow configurations consisted of a standard pillow, a neck pillow, and a shoulder pillow.

Landry et al. (2015) studied sleep quality measurements in older adults over 55 years of age, comparing subjective and objective methods. The subjective methods used were the Pittsburgh Sleep Quality Index (PSQI) and the Consensus Sleep Diary (CSD). The objective measurements used actigraphy with MotionWatch 8. The results of this study showed that perceived sleep quality (subjective method) differed from the results of the objective method in adults over 55 years of age. This difference was not related to age, gender, education, or cognitive status. The best way to measure sleep quality in older adults is to use both subjective and objective methods.

Munawaroh et al. (2016) studied pillow softness based on physical parameters by determining the kapok filling composition, resulting in soft pillows at low production costs. The physical characteristics of pillow softness were assessed using the pillow force constant. Five pillows of the same size and density with different kapok compositions were tested. The kapok used was high- and medium-quality kapok. The results of this study indicate that to produce a soft pillow at a low production cost, the pillow should be filled with high- and medium-quality kapok in a 50:50 ratio

CONCLUSION
The product's test results on pregnant women yielded a score of 8 with an A, which is considered very good. Therefore, this product can be used to improve sleep quality for pregnant women in the third trimester.

ACKNOWLEDGMENTS

CONFLICTS OF INTEREST

This research does not involve any conflict of interest.

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DETERMINANT FACTORS ASSOCIATED WITH DIGITALIZATION OF LEADERSHIP COMMUNICATION AT HOSPITAL

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ABSTRACT

Background: The digital era has accelerated the digitalization of organizational processes, including leadership communication. The emergence of digital leadership requires leaders to adapt their communication and leadership styles to dynamic, technology-mediated work environments. In hospital settings, effective digital leadership communication is essential to support coordination, decision-making, and quality nursing care.

Purpose: This study aimed to identify determinants associated with the digitalization of leadership communication in hospitals.

Methods: A cross-sectional study design was employed involving 131 nurses recruited through purposive sampling based on predefined inclusion criteria. Data were collected using structured questionnaires measuring leadership style, communication style, leadership skills, leader enthusiasm, and the implementation of digital leadership communication. Statistical analyses included the Spearman rho test, contingency coefficient, and multiple logistic regression to examine associations between variables.

Results: The findings indicated that 94.7% of respondents perceived the implementation of digital leadership communication as good. Leadership style showed a moderate positive correlation with digital leadership communication ($p = 0.000$; $r = 0.512$). Communication style was not significantly associated with digital leadership communication ($p = 0.434$; $r = 0.068$). Leadership skills demonstrated a strong positive relationship ($p = 0.000$; $r = 0.589$), while leader enthusiasm showed the strongest association ($p = 0.000$; $r = 0.698$). Multivariate analysis confirmed that leadership skills and enthusiasm were the most influential determinants.

Conclusion: Leader enthusiasm and leadership skills are key determinants of effective digitalization of leadership communication in hospital settings. Strengthening these competencies may enhance digital leadership practices and improve organizational communication in healthcare institutions.

Keywords: Communication, Digitalization, Enthusiasm, Leadership.

BACKGROUND

The digital transformation of healthcare organizations has significantly altered leadership communication practices, shifting interactions from predominantly face-to-face exchanges to digitally mediated communication channels such as emails, instant messaging platforms, and virtual meetings (Pettersen & Solstad, 2023; Solstad et al., 2021). In hospital settings, this transformation presents unique challenges, as leaders are required to communicate effectively across multidisciplinary teams in high-pressure, time-sensitive environments. However, many hospital leaders experience difficulties in adapting their communication styles to digital platforms due to limited digital competencies, inadequate training, and insufficient organizational readiness (Graesser et al., 2018).

Despite increasing reliance on digital communication tools in hospitals, leadership communication effectiveness remains inconsistent. Leaders often struggle to align their communication strategies with digital media, resulting in reduced clarity, weakened trust, and suboptimal coordination among healthcare professionals. The central research problem, therefore, concerns the factors that determine the successful digitalization of leadership communication in hospital settings (Abbas & Miller, 2025).

Although existing literature has explored digital leadership and e-leadership challenges, empirical studies focusing specifically on determinant factors influencing the digitalization of leadership communication in hospitals remain limited. Previous research has tended to address digital leadership in general organizational contexts, with less attention to healthcare institutions where communication failures can have critical consequences. Moreover, there is a lack of integrated analysis examining how leadership style, leadership skills, communication approaches, and leader enthusiasm collectively influence digital communication effectiveness (Zia et al., 2025).

Effective leadership communication is fundamental to ensuring patient safety, team collaboration, and organizational performance in hospitals. As healthcare systems increasingly adopt digital technologies, leaders who fail to adapt their communication practices risk exacerbating miscommunication, increasing work stress, and undermining team cohesion. Understanding determinant factors of digital leadership communication is therefore urgent to support leaders in navigating digital environments while maintaining high standards of care and organizational effectiveness (Badrinarayanan, 2024; Greimel et al., 2023).

The challenge of digital leadership communication is not confined to individual leaders but reflects a broader organizational issue affecting hospitals globally. The rapid expansion of digital technologies, virtual teamwork, and hybrid work arrangements has increased the complexity of leadership communication across healthcare systems. As digital tools become embedded in daily hospital operations, ineffective leadership communication can have widespread implications for workflow efficiency, staff satisfaction, and service quality (Bauwens & Cortellazzo, 2025).

Initially, leadership communication in hospitals relied heavily on direct interpersonal interactions, allowing immediate feedback and contextual understanding. Over time, advances in information and communication technology have accelerated the shift toward

digital communication platforms. While these tools offer advantages such as speed and accessibility, they also introduce challenges related to message richness, interpretation, and relational connection. This evolution necessitates adaptive leadership approaches that align communication strategies with technological contexts, as emphasized by Contingency Theory, which asserts that leadership effectiveness depends on situational alignment (Oshame & Maureen, 2023; Tsolka, 2020; Wang et al., 2024). Additionally, Media Richness Theory highlights the importance of selecting appropriate communication channels to reduce ambiguity and enhance understanding in complex organizational environments.

To address these challenges, systematic examination of determinant factors associated with the digitalization of leadership communication is required. By identifying key factors such as leadership style, leadership skills, communication competence, and enthusiasm toward digital tools, this study aims to provide evidence-based insights to support hospital leaders in adapting their communication practices. Strengthening digital leadership communication competencies can enhance trust, coordination, and organizational resilience, ultimately contributing to improved healthcare delivery in digitally mediated environments.

OBJECTIVE

This study aimed to identify determinants associated with the digitalization of leadership communication in hospitals.

METHODS

Study Design

This study employed a correlational research design with a cross-sectional approach to identify relationships between research variables.

Setting

The study was conducted at Regional Hospital in Bali, in November 2023.

Research Subject

A stratified random sampling method was employed to recruit participants from a heterogeneous population of nurses, ensuring proportional representation across relevant strata. Following stratification, systematic random sampling was used to select participants who met the predefined inclusion criteria. The inclusion criteria were: (1) permanent nursing staff, (2) a minimum educational qualification of a nursing diploma, (3) at least three years of work experience, and (4) willingness to participate in the study. The exclusion criteria included: (1) nurses working in administrative positions or not directly involved in patient care, and (2) nurses who were undertaking further education during the data collection period.

The total population consisted of 327 nurses. The sample size was determined by including approximately 40% of the total population, resulting in 131 participants. This sample size was considered adequate based on general recommendations for observational studies and multivariate analyses. Specifically, for multiple logistic regression, a minimum of 10–15 observations per independent variable is recommended to ensure stable parameter

estimates and sufficient statistical power. Given the number of predictor variables included in the model, the sample of 131 participants met these requirements. Additionally, with a conventional significance level of $\alpha = 0.05$ and an anticipated moderate effect size, this sample size was deemed sufficient to detect statistically meaningful associations. This approach aligns with STROBE guidelines, which emphasize adequate sample size, transparency in sampling procedures, and representativeness in observational research.

Instruments

Data were collected using a self-administered questionnaire developed by the researchers based on relevant theories of digital leadership and communication. Prior to data collection, the instrument underwent content, construct, and reliability testing to ensure methodological rigor. Content validity was established through expert review by nursing management and communication specialists, who evaluated the clarity, relevance, and representativeness of each item. Convergent validity was assessed using item loading values, which ranged from 0.54 to 0.91 across 24 items, exceeding the recommended threshold of 0.50 and indicating acceptable construct validity. Internal consistency reliability was examined using Cronbach's alpha coefficients. The results demonstrated satisfactory reliability for all dimensions: leadership style ($\alpha = 0.79$), communication style ($\alpha = 0.83$), leadership skills ($\alpha = 0.64$), enthusiasm ($\alpha = 0.94$), and digital leadership communication ($\alpha = 0.93$). All values exceeded the minimum acceptable criterion of 0.60, confirming that the instrument was reliable and internally consistent. The questionnaire comprised several sections. Communication style was measured using 18 items representing six styles: controlling, structuring, equalitarian, dynamic, relinquishing, and withdrawal. Leadership style was assessed with 29 items covering nine leadership types: autocratic, participative, delegative, bureaucratic, charismatic, transformational, transactional, servant, and situational leadership. Leadership skills were measured using 10 items, enthusiasm using 11 items, and digital leadership communication using 13 items. All items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scales were designed to capture participants' perceptions of leadership behaviors, communication practices, and the extent of digitalization in nursing leadership contexts.

Data Analysis

Data were tabulated and analyzed using inferential statistical techniques, encompassing both bivariate and multivariate analyses. Bivariate analysis employed the Spearman rho test to examine non-parametric correlations between leadership skills, enthusiasm, education level, and work experience and digital leadership communication. Associations between nominal-scale independent variables including age, gender, leadership style, and communication style and digital leadership communication were analyzed using the contingency coefficient test. Multivariate analysis was conducted using multiple logistic regression to assess the simultaneous influence of independent variables on digital leadership communication while controlling for potential confounding factors. Statistical significance was set at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the Ethics Committee of the Institute of Technology and Health Sciences (ITEKES) Bali (Approval No. 03.0438/KEPITEKES-BALI/XI/2023). Written informed consent was obtained from all participants prior to data collection. Participant confidentiality and anonymity were strictly maintained, with data securely stored and accessible only to the research team. Additional site-specific permissions were obtained in compliance with institutional and local governance requirements.

RESULTS

Table 1. Distribution of general characteristics of respondents (n=131)

Characteristics of Respondents	Frequency (f)	Percentage (%)
Gender		
- Male	45	34.4
- Female	86	65.6
Age (year)		
- 19-28	23	17.6
- 29-42	107	81.7
- >42	1	0.8
Education		
- Diploma 3 of nursing	104	79.4
- Diploma 4 of nursing	1	0.8
- Bachelor of nursing	26	19.8
Working experience (year)		
- 5-9	70	53.4
- 10-14	51	38.9
- $\geq$15	10	7.6

Table 1 shows that most respondents are female, with 86 individuals (65.6%), aged 29-42 years, with 107 individuals (81.7%), holding a Diploma III in Nursing, with 104 individuals (79.4%), having work experience of 5-9 years, with 70 individuals (53.4%), and having work experience of more than 15 years, with 10 individuals (7.6%).

Table 2. Distribution of leadership communication digitization, leadership style, communication style, leadership skills, and enthusiasm (n=131)

Variable	Frequency (f)	Percentage (%)	Mean	Median	SD
Digitalization of Communication Leadership					
- Good	124	94.7	1.05	1	0.22
- Poor	7	5.3			
Leadership style					
- Good	121	92.4	1.13	1	0.34
- Poor	10	7.6			
Communication style					
- Good	121	92.4	1.07	1	0.26

- Poor	10	7.6			
Leadership skill					
- Poor	8	6.1	2.85	3	0.49
- Moderate	3	2.3			
- Good	120	91.6			
Enthusiasm					
- Very low	9	6.9	3.95	4	0.97
- Moderate	11	8.4			
- High	79	60.3			
- Very high	32	24.4			

Table 2 shows that leadership communication digitization is proceeding well, reaching 94.7%, with good leadership style at 92.4%, good communication style at 92.4%, good leadership skills at 91.6%, and high enthusiasm at 60.3%.

Table 3. Bivariate analysis of determinant factors associated with leadership communication digitization at regional hospital in Bali (n=131)

Variable	Digitalization of Communication Leadership				Total		r	P-value
	Good		Poor					
	f	%	f	%	f	%		
Gender								
- Male	39	29.8	6	4.6	45	34.4	0.249	0.003*
- Female	85	64.9	1	0.8	86	65.6		
Age (year)								
- 19-28	22	16.8	1	0.8	23	17.6		
- 29-42	101	77.1	6	4.6	107	81.7	0.030	0.944
- >42	1	0.8	0	0	1	0.8		
Education								
- Diploma 3 of nursing							0.684	-0.036*
- Diploma 4 of nursing								
- Bachelor of nursing								
Working experience (year)								
- 5-9							0.219	0.108
- 10-14								
- ≥15								
Leadership style								
- Good	113	86.3	0	0	113	86.3	0.512	0.000*
- Poor	11	8.4	7	5.3	18	13.7		
Communication style								
- Good	114	87	7	5.3	121	92.4	0.068	0.434
- Poor	10	7.6	0	0	10	7.6		
Leadership skill								
- Poor							0.589	0.000*
- Moderate								
- Good								

Enthusiasm		
- Very low		
- Moderate	0.698	0.000*
- High		
- Very high		

Significant*

Table 3 presents the results of the bivariate analysis, indicating that gender, education level, leadership style, leadership skills, and enthusiasm are significantly associated with leadership digitalization ($p < 0.05$).

Table 4. Multivariate analysis of determinant factors associated with leadership communication digitalization

Variable	DCL	Gender	Age	Education	WE	LS	CS	LK	E
Digitalization of Communication Leadership (DCL)	1	-0.28	0.02	-0.04	-0.10	0.60	-0.07	-0.75	-0.72
Gender	-0.26	1	-0.06	-0.02	0.09	-0.09	0.21	0.34	0.13
Age	0.02	-0.06	1	0.22	0.27	0.06	0.05	-0.05	0.00
Education	-0.04	-0.02	0.22	1	0.11	-0.15	-0.15	-0.05	0.12
Work experience (WE)	-0.10	0.09	0.27	0.11	1	0.04	0.16	0.15	0.03
Leadership style (LS)	0.60	-0.09	0.06	-0.15	0.04	1	0.64	-0.60	-0.60
Communication style (CS)	-0.07	0.21	0.05	-0.15	0.16	0.64	1	0.08	0.01
Leadership skill (LK)	-0.75	0.34	-0.05	-0.05	0.15	-0.60	0.08	1	0.78
Enthusiasm (E)	-0.72	0.13	0.00	0.12	0.03	-0.60	0.01	0.78	1
R2 = 0.708									
p < 0.001									

Table 4 presents the results of the multivariate analysis, which yielded an R^2 value of 0.708, indicating that 70.8% of the variance in leadership communication digitalization is explained by characteristic factors (gender, age, education level, and work experience), leadership style, communication style, leadership skills, and enthusiasm. The remaining 29.2% of the variance is attributable to other factors not examined in this study. The ANOVA test produced a p-value of 0.000 ($p < 0.001$), demonstrating that the independent variables collectively have a statistically significant association with leadership communication digitalization.

DISCUSSION

The findings of this study indicate that the majority of implementing nurses perceived the digitalization of leadership communication as being well implemented in the hospital setting. This perception suggests that digital communication practices have been relatively accepted and integrated into daily leadership activities. Such outcomes may be influenced by several supporting factors identified in this study, namely leadership style, communication style, leadership skills, and leader enthusiasm. Among these factors, leadership style demonstrated the strongest and most consistent association with the digitalization of leadership communication, highlighting its central role in shaping how digital communication is enacted within healthcare organizations.

The strong relationship between leadership style and leadership communication digitalization may be explained by leaders' capacity to adapt their leadership approaches to situational demands rather than relying on a rigid or singular style. Digital work environments are inherently dynamic, requiring leaders to respond flexibly to technological changes, team diversity, and evolving communication needs. This adaptive orientation reflects key characteristics of digital leadership, which emphasize agility, responsiveness, and continuous learning. Digital leadership has been described as the ability to lead effectively through digital communication, conduct virtual supervision without physical presence, manage tasks efficiently through digital platforms, and respond constructively to rapid technological developments. These attributes are consistent with Contingency Leadership Theory, which posits that leadership effectiveness depends on the alignment between leadership behaviors and situational demands rather than adherence to a single leadership style (Santos, 2021).

The present findings support the view that effective leadership in digital environments requires continuous adaptation of communication strategies to maintain trust, clarity, and engagement (Nieken, 2022). However, this perspective is challenged by studies suggesting that leadership style remains relatively stable despite technological change, implying that digitalization alone may not be sufficient to alter entrenched leadership behaviors. The divergence between these perspectives indicates that leadership adaptation is not an automatic consequence of digital transformation but is instead contingent upon contextual enablers such as organizational culture, leadership development mechanisms, and the extent of technological integration. In hospital settings, where ineffective communication can directly compromise patient safety and disrupt team coordination, leaders may face stronger situational pressure to adjust their leadership behaviors, thereby reinforcing the relevance of contingency-based leadership adaptation in digital contexts (Musaigwa & Kalitanyi, 2024).

In contrast to leadership style, communication style demonstrated a weaker association with leadership communication digitalization, suggesting that the adoption of digital tools does not necessarily translate into meaningful changes in communication practices. This finding highlights a critical gap between technological availability and communicative effectiveness, where traditional, one-way communication patterns persist despite digitalization. Such patterns undermine the interactive potential of digital platforms and limit opportunities for feedback and shared decision-making. Consistent with prior research, authoritarian and unidirectional communication styles have been shown to be ineffective in digital contexts due to their restrictive impact on engagement, creativity, and collaboration (Hidayatullah & Toni, 2023). These findings underscore that, particularly in healthcare settings, digital leadership communication must move beyond information transmission toward dialogic, two-way communication that supports interdisciplinary collaboration and collective problem-solving.

Furthermore, communication dynamics in digital leadership contexts are shaped not only by technological factors but also by individual differences among communicators, including gender-related communication orientations and social positioning. Genderlect Theory posits that men and women tend to employ different communicative orientations

commonly characterized as information-focused ("report talk") and relationship-focused ("rapport talk") which can influence how messages are constructed, interpreted, and responded to in digitally mediated interactions (Rodino, 1997). In addition, Standpoint Theory argues that individuals' social locations and lived experiences shape their perspectives, resulting in communication interpretations that are partial and context dependent rather than universal (Rolin, 2009). In the context of digital leadership communication, these theories help explain why the effectiveness of communication styles may vary across team members despite the use of the same digital platforms. They suggest that the success of digital communication is not determined solely by the medium or frequency of interaction, but also by how messages are framed, received, and interpreted within diverse professional and social standpoints. This reinforces the need for leaders to adopt inclusive, dialogic communication approaches that accommodate diverse interpretive frameworks within multidisciplinary healthcare teams.

Leadership skills emerged as a strong determinant of leadership communication digitalization, highlighting the critical role of competency development in enabling effective leadership within digitally mediated environments. Digital leadership skills encompass communication proficiency, digital literacy, adaptability, role modelling, digital vision, and cultural awareness, all of which are essential for sustaining leadership effectiveness during digital transformation (Cahyarini, 2021). Leaders who possess strong digital competencies are better equipped to use digital platforms strategically, communicate messages clearly, and preserve relational connections despite physical distance. These findings are theoretically supported by Social Information Processing Theory, which explains that meaningful impressions and interpersonal relationships can be developed through computer-mediated communication by leveraging available verbal, linguistic, and contextual cues (Sumner & Ramirez, 2017). Nevertheless, the present findings diverge from previous studies that reported limited digital competence and preparedness among leaders, particularly in managing remote teams and digital service delivery (Pettersen & Solstad, 2023). This divergence may be explained by contextual differences such as variations in organizational support systems, access to leadership training, availability of digital infrastructure, and the maturity of digital leadership development initiatives.

Among all variables examined, enthusiasm demonstrated the strongest association with leadership communication digitalization. Enthusiasm reflects intrinsic motivation, curiosity, and positive engagement with change, which are essential for learning and adaptation during digital transformation. Individuals who display high levels of enthusiasm are more inclined to explore new communication tools, overcome resistance to change, and actively participate in digital communication processes, thereby supporting effective leadership communication in digital environments. Enthusiasm has been described as a self-reinforcing emotional state that generates energy, commitment, and persistence, enabling individuals to respond constructively to organizational change (Abhari, 2025). The prominence of enthusiasm in this study highlights the affective dimension of digital leadership, which is often underemphasized compared to technical competence and strategic leadership capabilities. While digital skills and leadership strategies remain important, emotional readiness and positive attitudes toward change appear to play a decisive role in

determining whether digital leadership communication is successfully implemented. This finding is consistent with research on organizational change, which emphasizes that motivation and positive affect significantly influence individuals' willingness to adopt and sustain new practices. Therefore, fostering enthusiasm through supportive leadership, recognition, and continuous learning opportunities may represent a critical strategy for strengthening digital leadership communication in healthcare organizations (Sacavém et al., 2025).

Overall, this study reinforces the view that digitalization of leadership communication in hospitals is a multifaceted process influenced by behavioral, cognitive, and affective factors. Leadership style, leadership skills, and enthusiasm appear to play particularly significant roles, while communication style may require more intentional refinement to fully leverage the potential of digital communication platforms. These findings contribute to the growing body of knowledge on digital leadership in healthcare and provide practical implications for leadership development and organizational policy in digitally transforming hospital environments.

Implications for Practice

The findings of this study have important implications for hospital leadership and organizational development. Given the strong influence of leadership style, leadership skills, and enthusiasm on the digitalization of leadership communication, hospitals should prioritize leadership development programs that emphasize adaptive leadership, digital communication competence, and positive engagement with technological change. Training initiatives should not only focus on technical digital skills but also on fostering flexibility, emotional readiness, and participatory communication approaches. Moreover, hospital management should create supportive environments that encourage experimentation with digital communication tools and provide continuous feedback to enhance leaders' confidence and effectiveness in digital settings.

Limitations

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to infer causal relationships between determinant factors and the digitalization of leadership communication. Second, data were collected using self-reported perceptions of implementing nurses, which may be influenced by response bias or social desirability. Third, the study focused on a single institutional context, which may limit the generalizability of the results to other hospitals with different organizational cultures, technological infrastructures, or leadership models. Despite these limitations, the study provides valuable empirical insights into factors influencing digital leadership communication in hospital settings.

Future Research

Future studies are recommended to adopt longitudinal or mixed methods designs to better capture changes in leadership communication practices over time and to explore causal mechanisms. Further research could also examine additional variables such as organizational culture, digital infrastructure readiness, and psychological safety as potential determinants of

digital leadership communication. Comparative studies across different hospital types or healthcare systems would enhance generalizability and deepen understanding of contextual influences. Additionally, qualitative exploration of leaders' lived experiences could complement quantitative findings and provide richer insights into how digital leadership communication is enacted in practice.

CONCLUSION

The digitalization of leadership communication in nursing care services within hospital settings has been effectively implemented. This success is significantly influenced by leadership style, communication style, leadership skills, and leader enthusiasm, which are further associated with leaders' age and educational level. Greater maturity and higher educational attainment support the development of adaptive leadership behaviors, effective digital communication, and sustained motivation in the digital leadership process. These findings highlight that effective digital leadership extends beyond technological adoption and requires strengthening leadership competencies and enthusiasm for change. Hospital management should prioritize leadership development initiatives focused on digital communication skills, flexible leadership approaches, and continuous professional education. Future research is recommended to explore additional organizational and technological factors influencing leadership digitalization using longitudinal or mixed-methods designs to enhance the sustainability of digital leadership practices in nursing services.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest associated with the material presented in this paper.

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MULTIPLE CASE STUDY : PRE-ANESTHESIA ASSESSMENT IN AMBULATORY ANESTHESIA PATIENTS

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ABSTRACT

Background: Pre-anesthesia assessment is a procedure to assess the feasibility and preparation of a patient's medical condition before anesthesia. Ambulatory anesthesia is a medical service that does not require hospitalization after anesthesia.

Purpose: To identify case study of pre-anesthesia assessment in ambulatory anesthesia patients

Methods: This study employed descriptive qualitative with a case study approach with multiple case study design. The data were collected by using interview guide. There were 5 participants included in this study. The data were analyzed by using case analysis and cross-case analysis.

Results: The finding showed that 5 participants described the pre-anesthesia assessment of ambulatory anesthesia patients, namely anamnesis including identity assessment, surgical indications, and anesthetic focus data. Physical examination includes breathing, blood, brain, bladder, bowel, and bone. Diagnostic examination analysis included laboratory and radiology, ASA physical status assessment, anesthetic considerations, and special considerations including distance and access to the hospital from the hospital, as well as the responsibility of the patient, but the history of obstructive sleep apnea and special considerations were not assessed in detail.

Conclusion: The pre-anesthesia assessment of the outpatient anesthesia included participant anamnesis, physical examination, diagnostic examination, assessment of ASA physical status, and assessment of anesthesia, whereas a detailed study of obstructive sleep apnea and special considerations is not carried out.

Keywords: Ambulatory anesthesia, Assessment pre-anesthesia.

INTRODUCTION

Pre-anesthesia assessment is a procedure performed to determine the feasibility and preparation of the patient's medical condition before anesthesia is performed. Anesthesiologists have an important task in doing so where the results of the assessment will be the basis for determining the anesthesia process that is safe and in accordance with the needs of the patient. Pre-anesthesia assessment in patients who will perform ambulatory anesthesia has differences with patients who undergo hospitalization. In patients who undergo day surgery have a more detailed assessment such as should only be done in patients with ASA I physical status and ASA II physical status (Walujo and Satya, 2020).

Over the past three decades, the increase in daily operations has continued to increase in various countries in the world (Ali et al., 2017). This can be seen from the advances in science and technology that greatly affect surgical techniques and anesthesia. More and more anesthesia procedures are performed in one day or known as ambulatory anesthesia. Ambulatory anesthesia is planned for patients who can be discharged on the same day without hospitalization (Arif Kurniawan, 2019). Ambulatory anesthesia procedures have also been implemented in several hospitals in Bali, one of which is Kertha Usada Hospital in the Buleleng area. According to data obtained from the Preliminary study that has been conducted, there are 705 patients undergoing this procedure from the period 2021 to 2022.

Ambulatory anesthesia is the administration of anesthesia to a patient who does not require post-anesthesia hospitalization but still requires post-anesthesia recovery facilities. The uniqueness of this procedure is the proper selection of patients in outpatient surgery patients (Rehatta Margarita and Hanidito Elizeus, 2019). According to Bailey (2019) In this action, the patient can be discharged on the same day with maximum care after ensuring that the patient will not experience a risk that threatens the patient's health or life when the patient is discharged.

Many factors are driving the development of ambulatory anesthesia such as the increasing cost of treatment (hospitalization) in hospitals, the number of hospital beds that are increasingly limited compared to the increasing number of population(Siena, 2019). While according to Usnadi (2018) Ambulatory anesthesia is very useful to optimize in care and medical resources that have an impact on health services in hospitals, the need for post-anesthesia patient inpatient rooms is reduced so as to reduce the waiting list of inpatients in hospitals.

METHODS

Study Design

This research design uses qualitative descriptive through a case study approach with multiple case study design. The objects in this study are called participants or informants. In this case study using non-probability sampling technique with purposive sampling.

Setting

The study was conducted at Kertha Usada General Hospital from February to April 2023.

Research Subject

Participants in this study were anesthesiologists who were still actively on duty at Kertha Usada Hospital and totaled 5 people with inclusion criteria: Minimum education Diploma III Nursing Anesthesiology, Diploma III Nursing, and Bachelor of Nursing who obtained training in Anesthesiology Nursing, Working at Kertha Usada General Hospital, Anesthesiologists who have provided care to ambulatory anesthesia patients, Anesthesiologists who are willing to be participants in the study. The exclusion criteria in this study are: Anesthesiologist undergoing training outside Bali, Anesthesiologists who were on leave, illness, or clearance at the time the study was conducted.

Instruments

The data collection method used is an interview with supporting instruments in the form of interview guides.

Data Analysis

Data analysis using case analysis is a case study by discussing one case and cross-case analysis is cross-case data analysis used to compare and combine the findings obtained from each case in a *case study.*

Ethical Consideration

This research has received ethical approval from the ethics commission of the Bali Institute of Technology and Health with number: 04.0005/KEPITEKES-BALI/I/2023.

RESULTS

In this study, there were 5 participants in this study which can be described as follows:

Participant 1: based on the results of the interview obtained that participant 1 carried out an anamnesis which included examination of patient identity, surgical indications, and anesthetic focus data but in obstructive sleep apnea was not carried out in detail. Participant 1 also performed a physical examination using 6B which included breathing, blood, brain, bladder, bowel, and bone, then a diagnostic examination analysis was carried out, but in special considerations no detailed assessment was carried out. In the assessment of the physical status of ASA patients ambulatory anesthesia is carried out on patients with ASA I physical status and not infrequently on patients with ASA II, then on the consideration of anesthesia an assessment of the length of surgery is carried out and the anesthesia requirements used must be met. Anesthesia in ambulatory patients using a type of general anesthesia with a face mask technique.

Participant 2: based on the results of interviews with 2 participants, participants conducted an anamnesis which included patient identity, surgical indications, and anesthesia focus data. In patients with mild obstructive sleep apnea can still undergo ambulatory anesthesia. Physical examination and diagnostic analysis are also performed. Similarly, participant 1 did not make special considerations in detail, but it is necessary to ensure that the patient is accompanied by an adult who can be responsible for the patient's condition when discharged. on ASA physical status considerations and anesthesia considerations are also carried out on patients who will undergo ambulatory anesthesia.

Participant 3: from the results of interviews that have been conducted on participants 3 it was found that participants perform anamnesis on patients who will undergo ambulatory anesthesia including patient identity, type of surgery this is because not all patients can undergo

ambulatory anesthesia. Next in the history is the assessment of anesthesia focal data. related to physical examination, diagnostic examination, assessment of ASA physical status with ASA I and ASA II patients, and consideration of anesthesia is also carried out to determine the patient's condition before anesthesia. Participant 3 also did not assess the special considerations in detail, but it was necessary to ensure that the patient did not drive his own vehicle (driving). Participant 4: from the results of the interviews that have been conducted, it was found that 4 participants also did the same history and in obstructive sleep apnea a study was carried out. Participant 4 also underwent a physical examination, and diagnostic examination analysis. Participant 4 also said to give special consideration to patients who will undergo ambulatory anesthesia. The physical status of ASA is the same, namely ASA I and ASA II and anesthesia considerations

Participant 5: from the interviews that have been conducted it was found that participants carried out anamnesis, physical examination, diagnostic examination analysis, assessment of ASA physical status and consideration of anesthesia. In special considerations, a detailed study is not carried out, this is because special considerations are not a benchmark in determining whether patients can undergo ambulatory anesthesia or not. Are also carried out.

DISCUSSION

From the results of interviews conducted with the five participants who served as anesthesiologists, was found that all participants conducted an assessment of the patient's identity. At the time of study asked includes the patient's name, age, date of birth, address, occupation, education and from when to enter the hospital. This is in line with Mangku.G, (2018) which states that the history includes assessing the patient's identity or patient biodata. This assessment is important to ensure that the patient will indeed undergo surgery with ambulatory anesthesia.

In surgical indications, not all surgical procedures can be performed under ambulatory anesthesia. Ambulatory anesthesia can only be performed in minor surgeries such as curettage, AFF DJ Stant, soft tissue tumors with biopsy, repositioning and other minor surgeries. This is in accordance with Rahayu That no ambulatory anesthesia cannot be applied to all types of surgery. In some patients who have a high risk, ambulatory anesthesia is not allowed so that ambulatory patients are classified as patients with minor surgery such as circumcision, AFF DJ Stant. This statement is supported by Mubarak dan Sumantri, (2019) which states that ambulatory types of surgery can be performed on cataract, biopsy, and closed repositioning patients.

Furthermore, anesthesia focus data is assessed on the history of certain drug or food allergies, history of systemic disease, history of drug use or being consumed by patients because it may interact with anesthesia drugs, psychological bad habits such as whether the patient smokes and drinks alcohol, the patient's last meal intake or patient fasting at home and no less important is the history of previous anesthesia that is a concern as a stylist to find out whether the patient has a history of post-anesthesia such as severe pain, severe PNOV, shortness of breath and other possibilities that can occur. This is in line with Mangku.G, (2018) Special anamnesis related to anesthesia focus data that needs to be done includes a history of systemic diseases that have been suffered by patients or are being suffered by patients, rewater of use of drugs that have been or are being used, bad habits of patients such as smoking,

drinking alcohol, and users of certain drugs (sedatives and narcotics), history of food and drug allergies, patient fasting and the last is a history of surgery or anesthesia that has been undertaken by the patient. This study aims to determine whether the patient has a history of post-anesthesia that is not good such as post-anesthesia complications (uncontrolled pain, and severe PNOV). But in obstructive sleep apnea all participants did not conduct detailed assessments, they only assessed the anatomy of patients such as patients with short necks, patients with obesity who tend to have a higher risk. While according to Walujo dan Satya, (2020) said that a history of obstructive sleep apnea needs to be assessed in pre-anesthesia because obstructive sleep apnea is one of the complicators of intraoperative and postoperative. Obstructive sleep apnea can stimulate the sympathetic system so that it can increase blood pressure and can interfere with the cardiovascular system. In addition, obstructive sleep apnea can also increase the potential for cerebrovascular event myotatic infarction, bleeding and can even result in death.

The physical examination carried out includes breathing, blood, brain, bladder, bowel, and finally bone. This is in accordance with the Pre, Intra, Post-anesthesia Anesthesiology Structuring Care Module (Ikatan Penata Anestesi Indonesia, 2018) said that the physical examination through the 6B assessment includes B1 (Breathing) which includes LEMON examination, breathing patterns, and the patient's breathing sound. B2 (Blood) which includes a <2-second Parisian CRT examination, heart sounds one and two and whether there are additional heart sounds. B3 (Brain) on this examination to determine the patient's consciousness. B4 (Bladder) to determine urine production and find out whether the patient's urination can be done spontaneously or requires assistive devices. B5 (Bowel) this examination aims to determine intestinal noise, intestinal peristaltic, and whether there is liver enlargement. Finally, there is B6 (Bone) which aims to find out whether there are spinal disorders, whether the patient has stiff horns, whether the patient has fractures, extremity disorders due to injuries experienced.

All participants performed diagnostic examination analysis which included laboratory and radiological examinations. This analysis is important for all patients who will undergo anesthesia, especially in ambulatory anesthesia patients. If the diagnostic examination has abnormal results and affects the patient's condition, it must be reported to dr. Sp. An for a follow-up plan and whether the patient is still allowed to undergo surgery with ambulatory anesthesia. This is in line with Mangku.G, (2018) said that laboratory and radiological examinations and other examinations are very important to be carried out on patients who will undergo ambulatory anesthesia. Laboratory tests carried out include blood tests (Hb, Ht erythrocytes, leukocytes, bleeding period, and blood clotting period) and urine tests (physical, chemical and urine sediment examinations).

In particular, not all participants conducted an assessment of the distance and access of homes to health facilities. This is because it is not a benchmark in determining whether a patient can undergo ambulatory anesthesia or not. In special consideration, the most emphasized is that there are patients who accompany when coming to the hospital or in other words there are adults who can be responsible for the patient's condition when the patient is discharged later. This is not in line with Reader, (2010) Which states the length of distance from the hospital to home is one of the considerations because it can trigger risks that affect the instability of the patient's condition. This statement is also supported by Mubarak and Sumantri, (2019) Which

says the distance between the health facility and the patient's home should not exceed 60 minutes. In addition to the distance between health facilities and home, what needs to be considered is whether there are adults who understand and understand and can be responsible for the patient's condition after discharge and ensure that the patient does not drive his own vehicle.

Of the five participants, they said that the physical status of ASA allowed was ASA I and ASA II. Patients with ambulatory anesthesia usually have ASA I physical status and patients with ASA III and above are not allowed. This is in line with Begani and Mulchandani, (2019) said that the physical status classification of the American Society of Anesthesiologists is a guide for anesthesiologists in determining risk factors that can occur. Patients who are considered capable of undergoing anesthesia ambulatory procedures are patients with medically stable ASA I and ASA II physical status. While according to Walujo and Satya, (2020) said that patients with ASA I and ASA II physical status are prime candidates for ambulatory anesthesia.

All five participants had the same answer regarding the surgical time should not exceed 60 minutes. In surgery that takes more than 60 minutes, the patient cannot undergo ambulatory anesthesia. In addition, the requirements for anesthesia must be met, namely rapid and smooth induction, analgesia and anesthesia are quite good, the recovery period is conscious quickly, and manipulation is minimal. This is because it can affect the patient's condition after anesthesia. This is in line with Mubarak which states that the duration of surgery should not exceed 60 minutes. Surgery with a period of time that is too long will cause the effect of anesthesia accumulation so that the patient's conscious recovery period is also getting longer. Related to anesthesia requirements that must be met, rapid and smooth induction so that patients do not feel pain. Induction can be given intravenously, minimal manipulation, analgesia and anesthesia are good enough to relieve and relieve pain in surgery, anesthesia is deep enough for surgery, recovery period is fast so it does not require a long time to be in the hospital.

CONCLUSION

Based on the pre-anesthesia assessment on ambulatory anesthesia patients conducted by the five participants, it was concluded that the five participants carried out the anamnesis which included assessing the patient's identity, surgical indications because not all types of surgery can be done with ambulatory anesthesia, and finally the anesthesia focus data emphasized on post-anesthesia risk events in the form of PONV. Physical examination using 6B which includes B1 breathing, B2 blood, B3 brain, B4 bladder, B5 bowel, and finally there is B6 which is bone. Analysis of diagnostic examinations which include laboratory and radiology results in the form of ultrasound. In special considerations, not all participants conducted a detailed study. Then on the assessment of the physical status of ASA, patients who are allowed to undergo ambulatory anesthesia are patients with ASA I and ASA II. And the last is the consideration of anesthesia, namely the duration of surgery should not exceed 60 minutes, with the condition that anesthesia must be met in the form of fast and smooth induction, analgesia and anesthesia are good enough, the recovery period is conscious quickly, and manipulation is minimal.

SUGGESTIONS

With this research, Anesthesiologists can increase their knowledge regarding the importance of conducting a correct and precise pre-anesthesia assessment for patients undergoing outpatient anesthesia procedures, thereby minimizing or avoiding risks that may occur after surgery or anesthesia.

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DECLARATION OF CONFLICTING INTEREST

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THE EFFECT OF HEALTH EDUCATION USING AUDIOVISUAL MEDIA ON THE KNOWLEDGE AND ATTITUDE SCORES ABOUT PRE-HOSPITAL STROKE MANAGEMENT IN FAMILIES

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ABSTRACT

Background: Health education about pre-hospital stroke management in families is very important. One of the medias that can be used in providing health education about pre-hospital stroke management is the audiovisual media.

Purpose: The purpose of this study was to find out the effect of health education with audiovisual media on family knowledge and attitudes about pre-hospital stroke management.

Methods: This study employed a pre-experimental design with one group pre-test and post-test design. The population in the study were families who lived and cared for the elderly (caregivers). The sample in this study were 33 respondents who were selected through simple random sampling. The instrument used in this study was a questionnaire. The statistical test used to analyze the data was the Wilcoxon Rank Test.

Results: The results showed that the average pre-test score of knowledge was 3.09, the median post-test score of knowledge was 6, the median pre-test score of attitudes was 28, the median post-test score of attitudes was 30, and the statistical test results obtained the p-value = 0.001.

Conclusion: There is an effect of health education with audiovisual media to the knowledge and attitudes of the families about pre-hospital stroke management. The health workers, particularly those working at the public health center should consider using audiovisual as a medium to provide health education to the community.

Keywords: Attitude, Audiovisual Media, Health Education, Knowledge, Pre-Hospital Stroke Management

BACKGROUND

Stroke is a condition in which the blood supply to the brain is disrupted due to either an obstruction of blood vessels (ischemic stroke) or the rupture of blood vessels (hemorrhagic stroke). Such disruption prevents oxygen and essential nutrients from reaching brain cells, leading to ischemia within minutes and resulting in irreversible brain tissue damage if not treated promptly. The affected brain area will lose its function, which in turn impairs the body parts controlled by that region (World Stroke Organization, 2022). Individuals experiencing a stroke require rapid and appropriate prehospital management, including early recognition of signs and symptoms and minimizing the response time. Effective prehospital care significantly influences the patient's subsequent clinical outcome (Centers for Disease Control and Prevention, 2022).

Ideally, every family member should possess adequate knowledge of prehospital stroke management. However, many families lack this understanding, which has a negative impact on their attitudes and behaviors (Ministry of Health of the Republic of Indonesia, 2017). Another issue identified is the limited use of health education media, which primarily relies on posters and leaflets that only provide visual information. Visual media alone are constrained in the amount of information conveyed and only engage a single sensory modality—vision (Sumerti et al., 2022). As a result, a more effective medium is required, such as audiovisual media. Audiovisual media can present information more clearly, can be replayed as needed, and engage both vision and hearing simultaneously (Sustiyono, 2021).

Global data from the World Stroke Organization indicate approximately 17 million stroke cases worldwide, causing 6.5 million deaths. In Indonesia, the prevalence of stroke increased from 7% in 2013 to 10.9% in 2018. Bali reported a prevalence of 10.7% in 2018 (Riskesdas, 2018a). In Badung Regency, 32.40% of stroke patients did not attend routine follow-up, and 18.40% did not seek care at health facilities in 2018 (Riskesdas, 2018b). North Kuta Health Center reports high rates of hypertension and diabetes mellitus—key risk factors for stroke. Banjar Kancil in Kerobokan Village has 90 elderly residents, and Kerobokan Village has the largest population in the North Kuta Health Center service area, with 43,372 residents (Badung Health Office, 2022).

Insufficient knowledge leads to negative attitudes regarding prehospital stroke care. The government has attempted to improve awareness using posters and leaflets distributed through public platforms, including the Ministry of Health's website, yet family knowledge and

attitudes remain inadequate. Inappropriate prehospital management may result in permanent disability or death, making understanding early stroke symptoms and response time critical (Agustini et al., 2017). The selection of health education media also influences educational effectiveness. Audiovisual media tend to be better remembered because they engage two senses —sight and hearing (Pratiwi et al., 2018).

The limited accuracy of prehospital stroke care highlights the need to improve family knowledge and attitudes. Previous studies focusing on audiovisual media for prehospital stroke education remain limited. Rachmawati et al. (2017) reported that many families with insufficient knowledge of stroke symptoms and the golden period arrived late to emergency care. Similarly, Pomalango (2022) found that families of individuals at high risk of stroke generally had poor recognition of stroke symptoms. Riduan et al. (2018) showed that audiovisual education improved knowledge and attitudes regarding early stroke detection. Since knowledge and attitudes influence behavior, providing education is essential.

Based on the above evidence, research evaluating the effect of audiovisual-based health education on family knowledge and attitudes regarding prehospital stroke management remains limited and requires further empirical investigation. Therefore, this study aims to examine the effect of health education using audiovisual media on knowledge and attitude scores regarding prehospital stroke management among families in Banjar Kancil, Kerobokan Village.

OBJECTIVE

This study was to find out the effect of health education with audiovisual media on family knowledge and attitudes about pre-hospital stroke management.

METHODS

Study Design

This study employed a pre-experimental design with a cross-sectional approach. The type of pre-experimental research used was the one-group pretest–post-test design.

Setting

The study was conducted in Banjar Kanci, Kerobokan Village, which is within the working area of the North Kuta Health Centre.

Research Subjects

The population in this study consisted of families who have elderly members, with a total of 130 people. The sampling technique used was total sampling, resulting in a sample size of 130 respondents. The inclusion criteria were: families residing in Banjar Kanci, Kerobokan

Village; families who live with and care for elderly individuals (caregivers); families aged 26–45 years; families who are able to read and write; and families who were willing to participate in the study and signed the informed consent form. The exclusion criteria were families with hearing or vision impairments and families who did not complete participation from the beginning to the end of the study.

Instruments

The research instrument used in this study was based on stroke management guidelines issued by the Ministry of Health of the Republic of Indonesia, which was modified by the researcher according to the study's needs. The knowledge variable consisted of 10 statements and the attitude variable also consisted of 10 statements. The research instrument underwent face validity testing by two experts in the field of stroke and was declared valid.

Intervention

The research procedures began with obtaining a research permit from the Investment and One-Stop Integrated Services Office of Badung Regency. After the research permit was issued, copies of the permit were submitted to the Head of the National Unity and Political Agency of Badung Regency, the North Kuta Subdistrict Office, and the Kerobokan Village Office. Prior to the intervention, the researcher distributed the knowledge and attitude questionnaires and explained the instructions for completion to the respondents.

The researcher then presented an animated video on prehospital stroke management one time in a group session using an LCD projector. After watching the video, the respondents were asked to complete the knowledge and attitude questionnaires again, and the researcher re-explained the procedure for filling them out. The completed questionnaires were collected and used for data analysis.

Data Analysis

Data analysis in this study was carried out in two stages. The first stage consisted of descriptive analysis of respondent characteristics, including gender, last educational attainment, prior information about prehospital stroke management, and sources of that information. The knowledge and attitude variables were tested for normality and found to be not normally distributed, as indicated by p-values $< \alpha$ in both pretest and post-test for each variable. Therefore, the bivariate analysis used a non-parametric test, the Wilcoxon Rank Test.

Ethical Consideration

This study obtained ethical approval from the Ethics Commission of the Bali Institute of Technology and Health, with approval number 04.0158/KEPITEKESBALI/III/2023.

RESULTS

Demography Data

Characteristics of respondents in this study include age, gender, education, occupation, previous exposure to information about prehospital stroke management, and the source of that information

Table 1. Frequency Distribution of Respondent Characteristics (n = 130)

Characteristics	Frequency (f)	Percentage (%)
Age		
26-35 years	63	48,5
36-45 years	67	51,5
Gender		
Female	130	100
Education Level		
Junior High School	37	28,5
Senior High School	51	39,2
Higher Education	42	32,3
Occupation		
unemployed	23	17,7
Military/Police	14	10,8
Medical Personnel	15	11,5
Educator	15	11,5
Entrepreneur	23	17,7
Private Employee	23	17,7
Others	17	13,1
Previous Exposure to Information		
Ever	53	40,8
Never	77	59,2
Source of Information		
Never received information	77	59,2
Social media	27	20,8
Relatives/Family	26	20

Table 1 presents the demographic data of the respondents. The majority of family members who accompanied the elderly were in the age group of 36–45 years, totaling 67 respondents (51.5%). All respondents were female (100%). Most had a higher education background, with 42 respondents (32.2%). In terms of occupation, the majority were unemployed, self-employed, or private employees, each amounting to 23 respondents (17.7%). Most respondents had never received information regarding prehospital stroke management, totaling 77 respondents (59.2%), while those who had received information were 53 respondents (40.8%). The sources of information were mainly from mass media (27 respondents) and from relatives (26 respondents).

Frequency Distribution Test

This study used the Kolmogorov–Smirnov normality test because the sample size was greater than 50 respondents

Table 2. Normality Test of Respondents' Knowledge and Attitude Scores (n = 130)

Kolmogorov smirnov	Significancy
Knowledge score	
Pre-Test	0,013
Post-Test	0,000
Attitude score	
Pre-Test	0,011
Post-Test	0,000

Based on Table 2, the normality test using the Kolmogorov–Smirnov method showed that the p-value for the pre-intervention knowledge score was 0.013 and the post-intervention knowledge score was 0.000, both of which are < 0.05. This indicates that the knowledge variable is not normally distributed. Similarly, the p-value for the pre-intervention attitude score was 0.011 and the post-intervention attitude score was 0.000, both < 0.05, indicating that the attitude variable is also not normally distributed.

Knowledge and Skills Test

Table 3. Frequency Distribution of Pre-Test and Post-Test Knowledge about Prehospital Stroke (n = 130)

	Knowledge	
	Pre-Test n (%)	**Post-Test** n (%)
Good	0	72 (55,4)
Fair	79 (80,8)	58 (44,6)
Poor	51 (39,3)	0

Based on Table 3, it is shown that during the pre-test, the majority of respondents had a moderate level of knowledge, totaling 79 respondents (80.0%), while 51 respondents (39.3%) had a poor level of knowledge. Meanwhile, during the post-test, the majority of respondents demonstrated a good level of knowledge, totaling 72 respondents (55.4%), and 58 respondents (44.6%) had a moderate level of knowledge.

Tabel 4. Frequency Distribution of Pre-Test and Post-Test attitude about pre hospital stroke (n = 130)

	Knowledge	
	Pre-Test n (%)	**Post-Test** n (%)
Good	90 (69,2)	130 (100)
Fair	40 (30,8)	0
Poor	0	0

Based on Table 4, it can be explained that during the pre-test, the majority of respondents had a good attitude, totalling 90 respondents (69.2%), while 40 respondents (30.8%) had a moderate attitude. After the educational intervention was given, during the post-test, all respondents demonstrated a good attitude, totalling 130 respondents (100%).

Table 5. The Effect of Health Education Using Audiovisual Media on Family Knowledge Regarding Prehospital Stroke Management (n = 130)

Wilcoxon Signed Ranks Test **Skor Pre-Test & Post-Test** **Knowledge**	
Negative Ranks	0[a]
Positive Ranks	32[b]
Ties	1[c]
Test Statistics	
Asymp. Sig. (2 *tailed)*	0.001

Based on Table 5, the statistical test results for respondents' knowledge scores showed a p-value of 0.001 (p-value < α = 0.05), thus H$_a$ is accepted, indicating that the provision of health education using audiovisual media has a statistically significant effect on the family's knowledge regarding prehospital stroke management in Banjar Kancil, Kerobokan Village.

Table 6. The Effect of Health Education Using Audiovisual Media on Family Attitude Scores Regarding Prehospital Stroke Management (n = 130)

Wilcoxon Signed Ranks Test **Skor Pre-Test & Post-Test** **Attitude**	
Negative Ranks	0[a]
Positive Ranks	24[b]
Ties	9[c]
Test Statistics	
Asymp. Sig. (2 tailed)	0.001

Based on Table 6, the statistical test results for the respondents' attitude scores showed a p-value of 0.001 (p-value < α = 0.05). Therefore, H$_a$ is accepted, indicating that the provision of health education using audiovisual media has a statistically significant effect on the family's attitude regarding prehospital stroke management in Banjar Kancil, Kerobokan Village.

DISCUSSION

The study showed that health education using audiovisual media had an effect on the family's knowledge scores regarding prehospital stroke management.

This was demonstrated by an increase in the family's knowledge scores after receiving health education. This finding is consistent with previous research which reported that balanced

nutrition education using video media influenced students' knowledge. Video media has the ability to present complex information in a way that is easy to understand (Suprapto et al., 2021). Another study also revealed that counseling using video media affected adolescents' knowledge about anemia (Asmawati et al., 2021). However, the findings of this study should still be interpreted cautiously because no control group was involved, preventing comparison between the intervention and control groups, and the research outcomes are highly influenced by respondent characteristics.

Individuals grow and develop within a family. One of the primary functions of the family is the health care function, namely the family's role in performing health behaviors and practices among its members, which influences the overall health status of the family (Kholifah & Widagdo, 2016). Families living with older adults must possess adequate knowledge regarding possible health problems in the elderly. One such health condition is stroke. A person experiencing a stroke needs to receive appropriate management before arriving at the hospital. The family's ability to perform prehospital stroke management is influenced by their knowledge and attitudes. Families should improve their understanding in order to perform prehospital stroke management correctly (Ministry of Health of the Republic of Indonesia, 2017).

Health education regarding prehospital stroke management must be provided to families to improve knowledge, and change attitudes and behaviors. Effective health education requires appropriate media to ensure optimal outcomes. Audiovisual media can facilitate delivery of information and enhance respondent understanding because it engages both visual and auditory senses. Audiovisual media is also more interesting to observe and less monotonous (Saragih & Andayani, 2022). Research by Fadilah et al. (2019) reported that health education using audiovisual media is more effective in increasing knowledge compared to lecture-based methods. Meanwhile, research by Janah & Timiyatun (2020) showed that audiovisual-based health education is more effective than leaflet-based education.

Adequate knowledge about prehospital stroke management contributes to minimizing permanent disability and even death in stroke patients. Accuracy and timeliness in providing early stroke care influence recovery outcomes. Therefore, health workers need to actively provide health education to the community regarding the importance of proper prehospital stroke treatment. Audiovisual media has been proven to be more effective in enhancing audience knowledge compared to other media. However, health education media currently used in practice are still dominated by posters or leaflets, which provide limited information and are

less engaging. Therefore, audiovisual media can serve as a solution to improve information comprehension effectively and efficiently.

Effect of Health Education on Family Attitude Score

The findings also showed that health education using audiovisual media had an effect on family attitude scores regarding prehospital stroke management. This was evidenced by an increase in attitude scores after the educational intervention. This is consistent with previous research which reported that audiovisual education for early stroke detection influenced attitudes among individuals at high risk of stroke (Riduan et al., 2018). Other research also revealed that learning using animated video media increased responsibility attitudes among early childhood students. Animated videos can improve memory retention and help children apply the knowledge they have gained (Irawan et al., 2021)

A positive family attitude is one of the keys to the successful implementation of proper prehospital stroke management. Attitudes are formed after a person receives information or has knowledge. Individuals with good knowledge are more likely to demonstrate positive attitudes (Irwan, 2017). Health education is one of the approaches to improve knowledge and attitudes. Health information is better absorbed when delivered through appropriate media. Audiovisual media features sound and visuals, engaging both hearing and sight. This dual-sensory involvement makes audiovisual media more advantageous compared to media that stimulate only one sense. It also enhances visualization and engagement, making it easier for respondents to understand and retain information (Saragih & Andayani, 2022).

The concept of stroke management emphasizes "time is brain" and the importance of the "golden period." Adequate knowledge accompanied by positive attitudes serves as a key to comprehensive stroke management. Information regarding prehospital stroke care must be widely disseminated through health education because stroke is an emergency condition. While health education can be delivered through various media, lecture-based or leaflet methods are still commonly used and only stimulate one sense. Therefore, more effective media, such as audiovisual media, are needed to improve learning outcomes and public awareness.

CONCLUSION

Health education using audiovisual media influences family knowledge and attitude scores regarding prehospital stroke management. Proper and effective prehospital stroke management is a skill that families must possess. Audiovisual-based health education can serve as an effective strategy to increase knowledge and improve attitudes. This study suggested that

Health workers, especially in primary health care centers, are encouraged to consider the use of audiovisual media in delivering health education to patients and the community regarding prehospital stroke management and other health-related topics to enhance the effectiveness of information delivery. Families, particularly those living with and caring for elderly individuals, are encouraged to utilize audiovisual media to improve their knowledge and develop positive attitudes toward prehospital stroke management and other health issues. Audiovisual media can enhance memory retention and improve comprehension.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest in this research.

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PHENOMENOLOGICAL STUDY: CAMPUS SECURITY EXPERIENCE OF THE MINISTRY OF HEALTH'S SURAKARTA HEALTH POLYTECHNIC AS A LAY HELPER IN PROVIDING FIRST AID & CARDIAC ARREST TREATMENT FOR ACCIDENT VICTIMS

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ABSTRACT

Background: Accidents are events that can occur at anytime and anywhere, including on campus. Campus security plays a strategic role as the vanguard in maintaining security and peace, as well as providing first aid in the event of such incidents.

Purpose: Aims of this study is to explore and understand in depth the experience of security officers at the Surakarta Ministry of Health Polytechnic Campus as lay helpers in providing first aid and cardiac arrest treatment for accident victims.

Methods: This study used were qualitative with a phenomenological approach. Data analysis used Interpretative Phenomenological Analysis (IPA). The research participants consisted of 5 security officers. Data were collected through in-depth interviews

Results: produced five main themes, namely: (1) Immediate first aid measures for victims, (2) Providing first aid according to ability, (3) Limited knowledge and skills in first aid, (4) Helping according to the dictates of conscience as a form of devotion and pride, (5) The need for routine training and coaching. The limitations include Reliance on interview data based on participants' subjective experiences, which has the potential to introduce recall bias and social-desirability bias in describing first aid skills and actions and cardiac arrest management.

Conclusion: The experience of security personnel shows the importance of providing first aid skills based on ongoing training so that they are able to act quickly, appropriately, and confidently in emergencies in a health education environment.

Keywords: Cardiac Arrest, Experience, First Aid, Lay Helper, Security

BACKGROUND

Accidents are events that can occur anytime and anywhere, including on campus. These incidents often result in injuries that always require prompt and appropriate first aid before professional healthcare professionals arrive on the scene. In critical and emergency such as cardiac arrest, a delay in treatment can significantly reduce the victim's chances of survival. According to (AHA, 2020). Every minute of delay in performing Cardiopulmonary Resuscitation (CPR) on victims can reduce the victim's chances of survival by 7–10%. This situation urgently requires our attention, not just healthcare workers; all elements must contribute to reducing the incidence. The public can be provided with health education on providing first aid (Khayudin & Hadi, 2021). Therefore, the ability of the general public, including security officers, to provide first aid is crucial.

Security gets a strategic role as the frontline in maintaining security and order in the educational environment. They are often the first to arrive at the scene of an incident or accident on campus. Although not medical professionals, they are strategically positioned to administer first aid, perform chest compressions or cardiopulmonary resuscitation (CPR) if trained, or quickly coordinate with medical services. This situation demands basic first aid skills for security personnel, particularly in cases of cardiac arrest or serious injuries. Security personnel's knowledge and skills in handling these situations can be a determining factor in the success of lifesaving efforts (Rizky & Widyastuti, 2021).

Several studies have shown that non-medical personnel who provide first aid to accident victims still have limitations in terms of preparedness, knowledge, skills, and confidence when providing first aid. Research by (Setyowati, Sari, & Utami, 2022) found that most lay people are afraid of making mistakes when helping victims, especially during CPR, due to a lack of direct experience and ongoing training. This underscores the importance of improving the competence and training of lay rescuers, such as campus security personnel.

A relevant phenomenological approach was used to explore the meaning of security personnel's experiences as lay rescuers in emergencies. Through this approach, researchers can understand individuals' perceptions, emotions, and thought processes within the real-life contexts they experience (Creswell & Poth, 2018). This in-depth understanding is expected to provide a comprehensive overview of the experiences, obstacles, and training needs of security personnel in providing first aid and cardiac arrest treatment to accident victims on campus.

Thus, this research is important to contribute to the development of emergency preparedness systems in health education institutions. Furthermore, the results can serve as a basis for developing training programs and campus policies that support the improvement of lay rescuers' competency in dealing with medical emergencies.

OBJECTIVE

This study aims to explore and understand in depth the experience of security officers at the Surakarta Ministry of Health Polytechnic Campus as lay helpers in providing first aid and cardiac arrest treatment for accident victims.

METHODS

Study Design is qualitative research with a phenomenological approach. Data collection was conducted through in-depth interviews using a structured interview guide (Afriyanti & Rachmawati, 2014). The researcher also used field notes. After data collection, the researcher analyzed the data using Interpretative Phenomenological Analysis (IPA) (Jeong & Othman, 2016). The research location was at the Poltekkes Kemenkes Surakarta campus. The research was conducted in October 2025. *Research Subject:* Five participants, the campus security of the Ministry of Health Polytechnic of Surakarta participated in this study. *Trustworthiness* After the interview was conducted, the researcher conducted observations with field notes, then transcribed the verbatim data, categorized and created sub-themes to become the main theme, and validated the data. *Ethical Consideration* on October 2025, with No. 18/EC/KEPK-BU/X/2025.

RESULTS

The characteristics of the participants who were interviewed can be explained in the following table:

No	Participant	Gender	Length of working (Years)	Age
1	P1	M	4th	39 y.o
2	P2	M	4th	34 y.o
3	P3	M	4th	30 y.o
4	P4	M	3,5th	28 y.o
5	P5	F	2th	23 y.o

Theme 1: Immediate aid actions for victims.

Tells about security perceptions regarding first aid for victims. Participants were asked how far they understood first aid as lay people in assisting victims.

"*First aid given upon witnessing an accident*" P1

"*First aid is an action to condition an incident*" P2

"*Actions performed with the tools available before the medical team arrives*" P3

"*First aid given and depends on the situation on the ground,*" P4

"*Immediate initial assistance given to a sick victim*" P5

Security acts as a lay helper who perceives first aid as an immediate action to be carried out on the victim before health workers or an ambulance arrive at the scene.

Theme 2: Providing First Aid According to Your Ability

Discusses the perceptions of participants/ security personnel as first responders in providing first aid to victims of cardiac arrest. Participants describe their understanding of their role as lay rescuers providing first aid to victims.

"*All I know is that you shouldn't lift someone; let a professional medical team do it.*" P1

"*Since I'm not a medical professional, I just calm them down and contact the relevant authorities.*" P2

"*As a security guard, I can only help direct traffic. If the victim is in serious condition, we can't help either.*" P3

"*We only know that if someone faints, we should give them resuscitation, but if their heart has stopped, I'm at a loss for what to do.*" P4

"*Take action with artificial respiration or pump the heart and lungs, which is important in the victim's chest.*" P5

Security personnel assist victims of cardiac arrest, using the knowledge they have, as is, and according to their ability to help the victim.

Theme 3: Limited Knowledge and Skills in First Aid

Most participants admitted to not having received formal training in Basic Life Support (BLS) or cardiac arrest management.

"*If there were official training, we would definitely be happy to participate. It's very important for us, who are often in the field.*" P1

"*There was a demonstration from the Health Team once, but it's been a long time, so I've forgotten.*" P2

"*During my time here, there hasn't been any first aid training. So if someone faints or has an accident, we do what we can.*" P3

"*I don't have the personal experience, knowledge, or physical ability to help accident victims. I can only provide information and advice based on my knowledge. If you need emergency assistance, please contact your local emergency services.*" P4

"I'm still not capable of providing first aid due to my lack of knowledge, and it's our duty to help accident victims." P5

Security officers recognize the importance of basic medical first aid knowledge, but have never received formal training. As a result, their actions are often based on intuition, observation, or previous experience.

Theme 4: Helping according to one's conscience as a form of devotion and pride

Depicts the feelings of campus security personnel after helping or assisting victims. For them, helping is not just a profession that is always at the forefront, but a form of self-dedication, humanity, and a source of pride.

"I feel proud and relieved, even though I'm just a security guard, to be able to help victims. That's extraordinary, in my opinion." P1

"It's a conscience-driven response that's ingrained in my profession and daily life." P2

"A calling from my conscience to help others and those experiencing disaster." P3

"Even if it's just helping guard the streets and reassuring those around me, I still feel like I'm playing a role. And it gives me a sense of happiness to be able to contribute to helping victims." P4

"I think our job isn't just guarding the gates or patrolling. If someone is in trouble, we have to help. That's part of our responsibility and dedication." P5

Security believes that helping is not only a physical act, but also a feeling and a social one that fosters feelings of pride, devotion, and a more rewarding professional identity.

Theme 5: The Need for Routine Training and Coaching

Security personnel believe in the importance of ongoing training and coaching as lay rescuers. They recognize that the security team's role extends beyond maintaining order and order, but also to ensuring emergency preparedness. However, most acknowledged that training related to first aid, Basic Life Support (BLS), and cardiac arrest management remains minimal, or even routinely absent.

"I really want to learn CPR and how to help someone who has stopped breathing. We're often the first people on the scene." P1

"I really want to learn CPR and how to help someone who has stopped breathing. We're often the first people on the scene." P2

"We want to have the skills of healthcare workers, at least knowing the first steps before the medical team arrives." P3

"I don't have the personal experience or physical ability to help accident victims." P4

"helping accident victims, for example, if we don't understand medical knowledge about how to help properly and correctly" P5

Training and coaching are considered important so that first aid measures can be carried out correctly, quickly, and safely, while also fostering self-confidence and preparedness in critical

situations.

DISCUSSION

Theme 1: Immediate first aid measures for victims

The above results indicate that the perception of first aid is the immediate action taken for the victim before health workers or an ambulance arrive at the scene. Conceptually, first aid is defined as the immediate effort given to someone who experiences a sudden injury or illness before receiving further medical treatment (Kementerian Kesehatan RI, 2023). According to (Ramdani, Wibowo, & Susanto, 2024), most people understand the importance of first aid, but there are still some limitations in practical skills, especially in cases of bleeding, respiratory arrest, and cardiac arrest. Furthermore, first aid is a very important initial action before the victim receives professional medical assistance. However, perceptions regarding who is entitled and capable of providing first aid are still limited.

The public assumes that first aid should only be administered by medical personnel or trained health workers. This finding aligns with research by (Rahmayanti, Wulandari, & Arifin, 2024), which found that public perception of the competence of lay first responders remains very low due to concerns about the risk of misuse. (Handayani & Yusuf, 2023) stated that empirical experience, such as witnessing or administering first aid, can increase public awareness of the urgency of rapid action in emergencies. Therefore, it can be concluded that public perception of first aid reflects their level of knowledge and experience. The greater the public's understanding and confidence, the greater their participation in providing first aid.

Theme 2: Providing First Aid According to Ability

The results above indicate that security guards provided first aid to victims of cardiac arrest using their existing knowledge, as is, and within their capabilities. This aligns with research conducted by (Wicaksono, Nugraha, & Rahayu, 2022), which found that lay rescuers tended to act based on intuition and everyday experience when facing emergencies. Limited formal knowledge and skills regarding first aid led respondents to choose actions that felt safest and most appropriate to their capabilities. This demonstrates an awareness of their own limitations, which is a crucial aspect of the safety of both victims and rescuers.

According to (Putri & Handayani, 2023), an individual's or a community's ability to provide first aid is greatly influenced by experience, training, and self-confidence. However, it is important to note that actions not based on proper knowledge can pose a risk to the victim's safety. Therefore, first aid training for the general public is essential to ensure more effective

and safe actions (Khayudin, 2020). Strengthening community capacity through education and regular simulations on Basic Life Support is crucial as part of community preparedness in emergencies. This demonstrates that providing first aid according to ability is a significant form of social responsibility.

Theme 3: Limited Knowledge and Skills in First Aid

Research results show that limited knowledge and skills are the main obstacles for lay people in providing first aid to accident victims or in emergencies. The majority of participants admitted to having never received formal first aid training, so the actions taken by first responders tend to be based on general knowledge or personal experience. This situation indicates a gap between practical needs in the field and the community's capabilities. This lack of confidence stems from a lack of knowledge and training in basic first aid skills.

According to Bandura (1997), in (Rahmawati & Nugroho , 2023), an individual's belief in their abilities (self-efficacy) significantly influences the decision to act in an emergency. When someone feels they have sufficient skills, they tend to hesitate or even be passive in taking action. This is also in line with research (Handayani & Sutopo , 2020), which shows that a lack of formal training results in lay rescuers only being able to perform basic actions such as calling for help or calming the victim, without performing simple medical procedures that can actually save lives. This limitation is also exacerbated by a lack of access to information and training. Weak public health literacy in emergencies is a key factor in determining the community's readiness to face emergencies and take appropriate rescue actions.

Theme 4: Helping according to conscience as a form of devotion and pride

The results above indicate that the participants' acts of helping were not solely motivated by work obligations, but rather stemmed from a sense of conscience and individual humanity. The moral values embedded within individuals are the primary drivers of altruistic behavior, namely helping others without expecting anything in return. This aligns with the opinion (Eisenberg, Spinrad, & Morris, 2021), who state that empathy and moral values are internal factors that significantly influence a person's tendency to help. Participants also described the experience of helping as a source of pride, especially when the rescue action was successful in saving or alleviating the victim's suffering. The sense of satisfaction and pride after helping indicates an intrinsic satisfaction stemming from service value. According to intrinsic motivation theory (Ryan & Decy, 2020), a person tends to feel more meaningful when their actions align with positive personal values and beliefs. In this context, helping becomes a form of profound self-actualization. Furthermore, helping victims is seen as a form of devotion to

others and social responsibility. Participants felt that by providing first aid, they were contributing to the safety of others and reflecting a positive image as part of a community.

Research (Prasetyo & Handayani, 2022) states that a sense of social responsibility and solidarity are important factors in fostering helpful behavior in the workplace and in the general public. The meaning of helping based on conscience also shows a connection to spiritual values. According to (Rahman , 2023), spirituality plays a crucial role in shaping prosocial behavior, as individuals with high spiritual awareness tend to have empathy and a strong drive to help others selflessly. Thus, this illustrates that helping is not merely a spontaneous response to emergencies but also a reflection of the moral, spiritual, and social values embedded within individuals. Helping according to the guidance of conscience is a symbol of sincere individual devotion and a source of personal pride, as through such actions, one can experience a deeper meaning in life and make a real contribution to others.

Theme 5: Need for Routine Training and Coaching

The results above indicate that participants felt a high need for routine training and coaching in providing first aid. This is because participants' awareness of their abilities in emergencies is still limited and easily degraded without regular training. Training is often one-off and lacks ongoing coaching, making the acquired knowledge and skills difficult to maintain long-term. According to (Handayani & Sutopo , 2020), the lack of formal training means lay rescuers are limited to performing basic actions such as summoning help or calming victims, without performing simple medical procedures that should be provided to victims. Therefore, repeated training is crucial to increase individual competence and confidence in providing first aid appropriately and safely. Furthermore, regular coaching from authorities or health institutions can provide feedback, correct procedural errors, and strengthen rescuers' discipline and preparedness.

According to Self-Determination Theory (Ryan & Decy, 2020), structured and supportive coaching can fulfill an individual's basic need for competence and relatedness, thus maintaining motivation to continue learning and helping others. Research (Eisenberg, Spinrad, & Morris, 2021) confirms that a person's empathy and concern for others' conditions develop more optimally when they are in a supportive environment that provides opportunities for consistent learning. In this regard, regular coaching plays a crucial role in developing a responsive, empathetic, and professional attitude in providing first aid. The need for regular training and coaching is a crucial aspect to ensure ongoing steps to improve the capabilities of lay rescuers. Continuous training efforts not only strengthen technical skills but also shape the

rescuer's character and prepare them for critical and emergency.

CONCLUSION

The experience of security officers from the Surakarta Health Polytechnic as lay rescuers in providing first aid and treating cardiac arrest in accident victims has yielded five key themes. First, immediate first aid for victims. Second, providing first aid according to ability. Third, limitations in first aid knowledge and skills. Fourth, assisting according to conscience as a form of devotion and pride. Finally, the a need for regular training and coaching. Overall, this study confirms that the security officers' experience as lay rescuers is not only related to the technical aspects of assisting, but also to moral, psychological, and social dimensions. This study suggests the need for enhanced training and certification, regular emergency situation simulations, collaboration with campus medical personnel, and enhanced campus community education.

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CONFLICTS OF INTEREST

There is no conflict of interest.

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OPTIMIZING THE QUALITY OF NURSING CARE DOCUMENTATION THROUGH NURSING SUPERVISION TRAINING IN THE INPATIENT ROOM OF RSIA BUNDA DENPASAR

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ABSTRACT

Background: Hospitals are health service organizations providing integrated care by professional caregivers, including doctors, nurses, nutritionists, and pharmacists. Nursing care documentation is essential for patients, nurses, and the entire health team involved in service delivery. Complete documentation supports continuity of patient care, facilitates coordination among professionals, and contributes positively to patient safety. Therefore, the completeness of nursing documentation plays an important role in improving the overall quality of health services provided by hospitals in daily clinical practice settings.

Subjective: This study aims to determine the optimization of the quality of nursing care documentation through nursing supervision training at RSIA Bunda Denpasar.

Methods: This study uses a pre-experiment method with a one group pre-test post test design. This study included a population of 38 nurses on duty in inpatient and the sample in this study was taken with a total sampling technique of 38 people. This study uses the wilcoxon signed rank test.

Results: The results of the Wilcoxon signed rank test obtained a significance value of < 0.005 for each variable so that supervision training was obtained to be able to optimize the quality of nursing care documentation through nursing supervision training in the Inpatient Room of RSIA Bunda Denpasar.

Conclusion: Based on the research conducted, it can be concluded that the provision of proctor and reflective model supervision training is able to optimize the quality of nursing care documentation through nursing supervision training in the Inpatient Room of RSIA Bunda Denpasar.

Keywords: Documentation, Nursing Care, Supervising Nurses, Training.

BACKGROUND

Nursing documentation is one of the evidence in the form of records which contain important data that is valid and needed by nurses when determining diagnoses, this data is very important for clients (patients), nurses, and for other health workers as the responsibility of nurses. Nursing documentation is one of the recording or documentation activities in the form of images of an event and activities that have been carried out (carried out) by nurses in the form of very important and valuable services (Duhaling et al., 2023).

This documentation is important because the nursing services provided to clients contain records and reports that can be used as responsibilities and liabilities from various possible problems experienced by clients, both satisfaction and dissatisfaction with the services provided (Ginting, 2019).

Because important information related to their treatment and health conditions is neglected. Inefficient and ineffective documentation due to inadequate quality and accuracy causes communication errors between nurses and other professions (Manuhutu, Novita, & Supardi, 2020).

So that to improve the quality of nursing care documentation, nursing supervision is carried out. Supervision is a direct and periodic observation by superiors of the work done by subordinates, if problems are found, immediate assistance is given to overcome them (Tokan, 2020)

The impact of the lack of documentation standards for nursing care can make the quality of nursing care poor, lack of accountability to patients, no information on individual protection, no evidence of nursing practice, lack of communication in nursing care, inconsistency in costs, and lack of planning for nursing health services in the future. The incompleteness of nursing care documentation can be caused by several factors, namely lack of supervision or supervision so that it is difficult for nurses to carry out effective but efficient documentation, the level of education, training related to documentation, and lack of motivation to carry out the documentation process (Rahmayanti, Mahdarsari, Maurissa, Yuswardi, & Yusuf, 2024).

OBJECTIVE

This study aims to determine the optimization of the quality of nursing care documentation through nursing supervision training at RSIA Bunda Denpasar

METHODS

Study Design

This study uses a pre-experiment method with a one-group pre-test post test design

Setting

The population in this study is all inpatient nurses in the Inpatient Room of RSIA Bunda Denpasar as many as 38 nurses.

Research Subject

Sampling selection using simple random sampling technique with inclusion and exclusion criteria

Inclusion criteria:

    a. Nurses who are willing to be responders

    b. Implementing nurse on duty in inpatient

    c. Nurses who have never received supervision training

Exclusion Criteria:

    a. Head of the nursing room

Instruments

The instruments used to evaluate the Optimization of the Quality of Nursing Care Documentation Through Nursing Supervision Training in the Inpatient Room of RSIA Bunda Denpasar are nursing care instruments and supervision instruments in the form of questionnaires.

Intervention (this heading is only for experimental studies)

The intervention provided in this study was in the form of supervision training with a proctor and reflective model for one month.

Data Analysis

The data analysis technique used in this study is a data analysis technique using a multivariate test with a multiple logistic regression test with a significance of <0.05

Ethical Consideration

This research has passed the ethics test with number No.379/EA/KEPK-BUB-2024. Researchers in carrying out research adhere to research ethics which consist of five principles, namely:

    a. Self Determination

    This principle gives autonomy to respondents to determine their participation in the research. Before data collection is carried out, the researcher will provide clear information to prospective respondents.

    b. Anonymity and Confidentiality

    The researcher is responsible for maintaining the anonymity of the respondent by not including the identity of the respondent but using the respondent code. Meanwhile, the implementation of the principle of confidentiality is carried out by the researcher by maintaining all information obtained from the respondents and ensuring the use of the information only for research purposes.

    c. Privacy and Dignity

    The researcher maintains the privacy and dignity of the respondents by respecting every data provided by the respondents and only using the data provided for research purposes.

    d. Fair Treatment

    The application of the principle of fair treatment means respecting the equal right of every individual to engage in research without discrimination.

    e. Protection from Discomfort and Harm

    This principle considers the comfort of respondents both physical, psychological, and social comfort during the study.

RESULTS

Table 1.1 Results of Respondent Characteristics

Category	Frequency	Percentage
Gender		
- Male	16	42,1
- Female	22	57,9
Education		
- DIII Nursing	16	42,1
- S1/ Ners	22	57,9
Working Period		
- < 1 th	4	10,5
- 2-3 th	19	50
- > 3 th	15	39,5
Total	**38**	**100%**

Based on the results of table 1.1, the majority of respondents who have a female gender are 22 people with a percentage of 57.9%. Based on education, the respondents had the majority of S1/Nurse education as many as 22 people with a percentage of 57.9%. Based on the working period, the majority of nurses have a working period of 2-3 years, as many as 19 people with a percentage of 50%.

Table 1.2 Results of Respondent characteristics

Category	*n*	*Mean* ±SD	Min	Max
Age	38	27,84 ± 2,31	24	32

Based on the results of table 1.2, the average age of the respondents in this study was 27 years.

Table 1.3 Results of the Nursing Care Questionnaire

Category	Frequency	Percentage
Pre Test		
- Incomplete	24	63,2
- Complete	14	36,8
Post Test		
- Incomplete	5	13,2
- Complete	33	86,8
- **Total**	**38**	**100%**

Table 1.3 Results of the Nursing Care Questionnaire, the majority of respondents in the pre-test obtained that some respondents carried out incomplete nursing care as many as 24 people with a percentage of 63.2% and after the supervision training and post-test were carried out, the results of the completeness of nursing care were obtained by the majority of 33 people with a percentage of 86.8%.

Table 1.4 Results of the Nursing Supervision Questionnaire

Kategori	Frekuensi	Persentase
Pre Test		
- Not Implemented	21	55,3
- Implemented	17	44,7
Post Test		
- Not Implemented	12	31,6
- Implemented	26	68,4
Total	**38**	**100%**

Based on the results of table 1.3, the majority of respondents in the pre-test obtained the results of not applying supervision as many as 21 people with a percentage of 55.3% and after conducting supervision training and post-test, the results of implementing the majority of supervision were obtained as many as 26 people with a percentage of 68.4%

Tabel 1.5 Results of Wilcoxon Signed Rank

Kategori	n	Mean	±SD	Z_{score}	P_{value}
Pre Test	38	1,44	0,50	-4,146	0,000
Post Ttest	38	1,68	0,47		

Based on the results of the Wilcoxon signed rank test, it was obtained that the significance value of each variable had a significance value of < 0.005 so that supervision

training was obtained to be able to optimize the quality of nursing care documentation through nursing supervision training in the Inpatient Room of RSIA Bunda Denpasar.

DISCUSSION

Based on the results of the Wilcoxon signed rank test, the significance value of each variable was obtained with a significance value of < 0.005 so that supervision training was obtained to be able to optimize the quality of nursing care documentation through nursing supervision training in the Inpatient Room of RSIA Bunda Denpasar. Supervision training is very important to be carried out in hospitals to improve nursing performance. One of the efforts made is to apply a procor and reflective supervision model. Proctor supervision is the most recommended supervision model in supervision training. Supervision of the Proctor model can improve clinical services that have an evidence base, can provide adequate support to clients. The supervision of the Proctor model has several functions in directing the supervised nurses, namely normative, formative and restorative functions that are effectively applied in nursing services. According to the researcher, the application of normative functions is useful for developing patient care related to professional nursing practices, formative functions increase self-awareness through educational roles so that they can carry out service activities by paying attention to patient safety, and through the application of restorative functions carried out by the head of the room through the provision of support and effective communication so that nurses can be motivated to carry out activities to patients who meet clinical standards and develop the professionalism of nursing supervisors (Ponco Nugroho & Sujianto, 2017).

The combination of implementing the Proctor supervision model is highly effective in improving the quality of healthcare services. One of them is by applying a reflective model. In the supervision of the reflective model, there is a reflection process led by a supervisor, where the supervisor will use trigger questions. Through this active reflection process, a supervisor can guide the nurse because the nurse will better understand the nursing practice being carried out. This can happen because in the supervision of the reflective model, the evaluation process must be prioritized to find out what must be improved or improved and there is no culture of judgment (Orenta Sidauruk, 2020).

So that supervision is an important part to help improve good clinical governance by providing support for the provision of safe and effective health services, so it is very important to improve the clinical supervision process (Widiyanto, Hariyati, & Handiyani, 2013).

CONCLUSION

Based on the research conducted, it can be concluded that the provision of proctor and reflective model supervision training is able to optimize the quality of nursing care documentation through nursing supervision training in the Inpatient Room of RSIA Bunda Denpasar.

ACKNOWLEDGMENTS

CONFLICTS OF INTEREST

There is no conflict in the implementation of this research.

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THE APPLICATION OF THE BUERGER ALLEN EXERCISE TO THE MANAGEMENT OF PERIPHERAL PERFUSION DISORDERS IN PATIENTS WITH TYPE II DIABETES MELLITUS IN DR. SOEDARSO HOSPITAL: CASE REPORT

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ABSTRACT

Background: Diabetes Mellitus, a'silent killer', causes hyperglycemia and metabolic problems. Ineffective peripheral tissue perfusion is a nursing concern that must be treated soon to avoid problems. The test measures the Ankle Brachial Index (ABI). Medical and lifestyle-based treatments for type II diabetic mellitus (DM) exist.

Purpose: The Buerger Allen Exercise (BAE) approach improves limb blood flow and is being studied in type II diabetics, Pontianak's Dr. Soedarso Hospital Murai Room

Methods: Descriptive observation is used in this case report. Typhus with Type II Diabetes Mellitus case study of 38-year-old Mrs. D. Writing data was collected through head-to-toe assessment, interviews, diagnostic exams, and BAE therapy (once daily for 3 days, ± 20 minutes).

Results: Mrs. D had frequent thirst, numb feet, tingling, and a fluctuating fever. HBA1C 12.08 (H), Tubex 6 positive, P-LCR: 25.7 (H), ABI value on the first day of the right foot and hand 0.85, left 0.84. Insufficient peripheral perfusion is the main nursing diagnosis. Circulation care is provided. On the third day, the right foot and hand ABI is 0.94 and the left 0.97.

Conclusion: The Buerger Allen Exercise enhances the client's lower extremity hemodynamics, which improves blood circulation in peripheral circulatory problems. Type II DM patients can avoid peripheral artery disease with BAE. BAE prevents type II diabetic peripheral artery disease.

Keywords: Ankle Brachial Index, Buerger's Allen Exercise, Diabetes Mellitus Type Ii

BACKGROUND

Diabetes Mellitus (DM) has emerged as a significant global health challenge, especially in developing countries, due to its many complications. Often referred to as a "silent killer," this disease has symptoms that develop gradually, causing many patients to remain unaware of their condition until serious complications arise (Sukartini et al., 2023). Diabetes Mellitus is a chronic disease characterized by persistently high blood sugar levels, as well as disturbances in the metabolism of carbohydrates, fats, and proteins (Nikmah et al., 2025).

World Health Organization (2023) reported that approximately 422 million individuals worldwide, or 8.5% of the population, have been diagnosed with diabetes mellitus, leading to around 1.5 million deaths each year. According to data from the (International Diabetes Federation, 2021),There were 537 million adults aged 20 to 79 living with diabetes, a number projected to rise to 783 million (12.2%) by 2045.

Metabolic disorders in individuals with diabetes mellitus (DM) are associated with rising blood glucose levels, which continue to increase over time. A common complication in DM patients is insufficient blood flow to peripheral tissues, which needs to be addressed promptly to prevent more serious health issues. Several methods are available for assessing perfusion, including intraprocedural morphological evaluation with digital subtraction angiography (DSA), the ankle-brachial index (ABI), and various non-invasive techniques such as laser speckle contrast imaging (LSCI), laser Doppler imaging (LDI), skin perfusion pressure (SPP) measurement, and transcutaneous oxygen (TcPO2) monitoring (Arkoudis et al., 2021).

The ABI is a straightforward, quick, and cost-effective procedure for evaluating peripheral perfusion. Factors that influence ABI results in individuals with diabetes mellitus include gender, age, duration of diabetes, blood pressure, exercise habits, and smoking habits. ABI results are categorized as follows: normal (0.9-1.3), mild narrowing (0.71-0.89), moderate narrowing (0.41-0.69), and severe narrowing (<0.4) (Hasina et al., 2021).

The ABI test demonstrates excellent sensitivity (79%-95%) and specificity (95%-96%) for identifying peripheral circulatory problems. Type II diabetes can be managed in two main ways: through medication and lifestyle changes (Rahmi & Rasyid, 2023). Buerger Allen Exercise (BAE) is an active exercise for leg posture that aims to prevent diseases of the peripheral blood vessels and increase blood flow in the lower extremities (Simarmata et al., 2021).

OBJECTIVE

This study aims to analyse the application of the Buerger Allen Exercise intervention on peripheral blood circulation in patients with type II diabetes mellitus in the Murai Ward of Dr. Soedarso Hospital, Pontianak.

METHODS

This study employed a descriptive observational design in the form of a case report. The study was conducted in the Murai Ward of Dr. Soedarso Hospital, Pontianak, from December 2024 to January 2025. The subject of the study was one patient selected using a purposive sampling technique, who experienced nursing care problems related to the risk of ineffective peripheral perfusion.

The inclusion criteria were adult patients aged 18 years and above, both male and female, with a history of Type II Diabetes Mellitus and classified as having a low risk of developing diabetic foot ulcers. Patients who experienced anxiety or depression, dyspnea, chest pain, or had chronic gangrene were excluded from the study.

The intervention applied in this study was Buerger Allen Exercise (BAE), which aimed to improve peripheral circulation in patients with Type II Diabetes Mellitus, in accordance with medical-surgical nursing practice guidelines. The instruments used in this study included Standard Operating Procedures (SOPs) and an Ankle Brachial Index (ABI) observation sheet. ABI measurements were conducted by the researcher using a sphygmomanometer to assess systolic blood pressure in both the upper and lower extremities.

Data collection was initiated with a baseline assessment through direct observation to obtain ABI values prior to the intervention. The patient had not previously received Buerger Allen Exercise therapy and provided written informed consent before participating in the study. Following the implementation of the Buerger Allen Exercise, systolic blood pressure measurements were repeated and ABI values were reassessed to evaluate changes in peripheral perfusion.

This study was conducted in accordance with ethical principles of research, including respect for autonomy through informed consent, confidentiality, fairness, honesty, and consideration of the balance between potential risks and benefits. The study was also grounded in evidence-based nursing practice to ensure the appropriateness and safety of the intervention

RESULTS

Case Report

The January 7, 2025, assessment results obtained a respondent with the initials Mrs. D, 38 years old, female, living in GG. Pak Kasih, Kubu Raya Regency, has a high school education background and works as a private employee. The client previously came to the Emergency Room of Dr. Soedarso Regional Hospital on January 6, 2025, at 23.00 WIB with complaints of floating dizziness, body feeling hot and cold, the client felt tense or sore in the back of the neck, the client also felt uncertain throughout her body, complaints had been felt for 5 days before coming to the Hospital. Vital signs: Blood Pressure 121/69 mmHg, Pulse 91 x / minute, Respiration 20 x / minute, SPO2 98%. Blood Sugar examination was carried out. The results were 341 mg/dl. The client reported frequently eating and drinking sweet drinks. He also reported drinking a bottle of Pocari Sweat and a sponge cake an hour before coming to the Hospital. He stated that he had never been on any medication or taken any blood sugar control medication.

The client was admitted to the Murai inpatient unit on January 7, 2025, at 12:00 PM WIB. During the assessment at 1:00 PM, she reported itching all over his body and easily felt tired and lethargic. He reported frequent thirst, dizziness, and weakness. She also reported numbness and tingling in his feet. He reported frequent sweating. He reported a history of type II diabetes mellitus for 1 year, but had never been on any medication or treatment. He appeared weak, and his lips appeared dry. A random blood sugar check for Mrs. D was 330 mg/dl. The ABI value for the right foot and hand was 0.86, and the ABI value for the left foot and hand was 0.88. The CRT was <3 Seconds, and his extremities felt cold.

The client reported experiencing a fluctuating fever and feeling chills for six days before admission. Her skin felt warm, and she appeared pale and weak. Upon examination, her vital signs were: blood pressure 116/77, pulse 105 beats/minute, respiratory rate 22 breaths/minute, temperature 38.5°C, and SpO2 99%. She weighed 45 kg and was 156 cm tall.

Diagnostic Assessment Report

The client's priority problem was the risk of ineffective peripheral perfusion, evidenced by hyperglycemia and a sedentary lifestyle (D.0015). Researchers set a target of 3x24-hour hospitalisation days, with the expectation of improving peripheral perfusion, with the following outcome criteria: increased peripheral pulses, moderately improved acral function, moderately improved systolic blood pressure, moderately improved diastolic blood pressure, and moderately improved ankle-brachial index. Planned interventions included maintaining circulation, assessing peripheral blood flow, identifying risk factors for circulation problems, avoiding blood pressure measurements in limbs with inadequate blood flow, encouraging consistent physical activity, and providing instructions on a nutrition plan to improve circulation.

The researchers incorporated strategies based on Evidence-Based Nursing Practice (EBNP), specifically the implementation of Buerger Allen Exercises (BAE), a treatment method that involves an active range of motion in the legs while periodically using gravity. Through BAE, which encourages muscle movement, postural changes, and positional exercises, this therapy can help improve blood flow and oxygen levels in the veins and legs. This treatment was performed for approximately 20 minutes daily for 3 days. At the end of the third day, the Ankle-Brachial Index (ABI) for the right arm and leg reached 0.94, while the left arm and leg reached 0.97, indicating progress.

The second nursing diagnosis identified for Mrs. D, based on the assessment results, was unstable blood glucose levels related to hyperglycemia (D.0027). The researcher set a target of 3 x 24-hour hospitalisation days, expecting to improve blood glucose stability, with the following outcome criteria: decreased dry mouth, decreased lethargy/fatigue, decreased thirst, and improved blood glucose levels. These actions included controlling high blood sugar levels, identifying possible causes of elevated glucose levels, checking blood sugar levels, observing symptoms associated with high blood sugar, encouraging individuals to self-monitor their blood sugar, recommending appropriate meal plans or dietary adherence, providing education on diabetes management, and collaborating on insulin use, if necessary, and collaborating on IV fluid administration. Pharmacological therapy for hyperglycemia management interventions included metformin 3x1 mg and Novorapid 3x7 IU.

The third nursing diagnosis is Hyperthermia related to the disease process (Infection) (D.0130). The researcher sets a target of 3x24 hours of treatment; Thermoregulation is expected to improve with the criteria for improved shivering, improved pallor, improved tachycardia, and improved body temperature (36.5-37.5°C). The planned interventions are hyperthermia management, identifying the causes of Hyperthermia (eg, dehydration, exposure to hot environments, use of incubators), monitoring body temperature, monitoring electrolyte levels, monitoring urine output, providing a calm environment, loosening or removing clothing, providing oxygen if necessary, recommending bed rest, and collaborating

in providing intravenous electrolyte fluids—pharmacological therapy in the third intervention, Mrs. D was given paracetamol and ceftriaxone.

Nursing Intervention And Implementation

The nursing interventions were carried out based on the primary diagnosis, following Evidence-Based Nursing (EBN) guidelines for Buerger-Allen Exercise therapy, which aims to improve the Ankle-Brachial Index (ABI). This intervention lasted three days and was followed by re-measurements. The evaluation results indicated a positive impact on the ABI, including an increase in the index, decreased blood glucose levels, reduced fatigue, diminished thirst, and less numbness and tingling.

The implementation of Evidence-Based Nursing Practice (EBNP) through the Buerger-Allen Exercise showed positive changes in the peripheral circulation of Mrs. D., a patient with diabetes. This improvement was reflected in the increase in her ABI score. Before the intervention, her ABI scores were 0.85 for the right hand and foot and 0.84 for the left hand and foot. After three days of intervention, her scores increased to 0.94 for the right side and 0.97 for the left side. Thus, the Buerger-Allen Exercise intervention has been proven effective in improving the hemodynamic status of patients with lower extremity issues, enhancing blood circulation in the legs affected by peripheral circulatory disorders.

Table 1. The Blood Pressure & Ankle Brachial Index Before and After Intervention

Day & Date	Blood Pressure & ABI Values Before Intervention	Blood Pressure & ABI Values After Intervention
January 7, 2025	Right arm: 135/82 mmHg Right leg: 115/77 mmHg ABI results for right hand & foot: 0.85 Left arm: 137/75 mmHg Left leg: 116/84 mmHg Left arm & foot ABI results: 0.84	Right arm: 137/87 mmHg Right leg: 118/88 mmHg ABI results for right hand & foot: 0.86 Left arm: 139/88 mmHg Left leg: 122/90 mmHg Left arm & foot ABI results: 0.87
January 8, 2025	Right arm: 130/81 mmHg Right leg: 110/77 mmHg ABI results for right hand & foot: 0.84 Left arm: 146/79 mmHg Left leg: 126/82 mmHg Left arm & foot ABI results: 0.86	Right arm: 133/73 mmHg Right leg: 117/81 mmHg ABI results for right hand & foot: 0.87 Left arm: 130//86 mmHg Left leg: 117/81 mmHg Left arm & foot ABI results: 0.88
January 9, 2025	Right arm: 146/82 mmHg Right leg: 126/80 mmHg ABI results for right hand & foot: 0.86 Left arm: 133/89 mmHg Left leg: 118/72 mmHg Left arm & foot ABI results: 0.88	Right arm: 127/82 mmHg Right leg: 120/80 mmHg ABI results for right hand & foot: 0.94 Left hand: 125/84 mmHg Left leg: 122/84 mmHg Left arm & foot ABI result: 0.97

Based on the results of implementing the Evidence-Based Nursing Practice (EBNP) and the Buerger-Allen Exercise intervention, the Ankle-Brachial Index (ABI) measurements were taken. On the first day, the ABI values were recorded as follows: right hand and foot: 0.85, and left hand and foot: 0.86. By the third day, the ABI measurements showed improvement, with values of 0.94 for the right hand and foot and 0.97 for the left hand and foot. The nursing evaluation of patient Mrs. D, after three days of intervention, indicated an increase in the ABI value to 0.94, which is classified as within the normal range.

DISCUSSION

The results of an assessment conducted on January 7, 2025, revealed that a 38-year-old client, Mrs. D, complained of itching all over her body. She also reported feeling tired and lethargic, and rarely engaged in physical activity such as exercise. Furthermore, she frequently felt thirsty, experienced dizziness, and felt weak. She complained of frequent numbness and tingling in her feet and frequently sweated. She had a one-year history of type 2 diabetes mellitus,

However, it was not undergoing treatment or taking any medication. She appeared weak, and her lips appeared dry. All of these complaints were strongly related to type 2 diabetes mellitus, which is accompanied by peripheral perfusion problems.

A frequently emerging issue is the increasing incidence of diabetes mellitus among younger people. The case above shows that the 38-year-old patient is considered young. Previously, the majority of type 2 diabetes mellitus sufferers were in the middle-aged group, or over 40, but now the prevalence is increasing among those under 40 (Nugroho et al., 2023).

Complex and diverse risk factors contribute to the development of type 2 diabetes mellitus in young people, including non-modifiable factors such as gender, age, and family history, as well as modifiable factors such as obesity, hypertension, physical inactivity, and smoking. Those with a family history of diabetes are at higher risk. Furthermore, obesity, high blood pressure, a sedentary lifestyle, and smoking are significant factors that increase the risk of type 2 diabetes among young people (Maharani et al., 2024).

In addition to age, gender can also play a role in the high rate of diabetes mellitus. The client is a woman, and according to research by (Marpaung & Hiko, 2023), the incidence of diabetes mellitus is higher in women than in men. Women face a higher risk of developing diabetes due to their potentially higher body mass index.

A random blood sugar test on Mrs. D revealed a GDS of 330 mg/dL. An unhealthy lifestyle, such as frequent consumption of high-sugar foods and lack of exercise, causes the elevated GDS in Mrs. D. The client's history of type II diabetes is caused by low insulin production from pancreatic beta cells and impaired insulin function, or insulin resistance (Harreiter & Roden, 2023). The HbA1c result showed a significant increase of 12.08%.

This test is an accurate method for measuring long-term blood sugar levels. The elevated HbA1c is caused by high blood sugar levels in Mrs. D's body, where haemoglobin binds to blood glucose more than usual. The principle of the HbA1c test is to distinguish between glycated and unglycated haemoglobin (Harahap et al., 2024). The ABI value for the right

hand and foot was 0.86, while for the left hand and foot it was 0.88. The CRT was <3 Seconds, and the extremities felt cold.

Mrs. D's ABI value was 0.86. A decrease in ABI is caused by hyperglycemia, which affects platelet function in the blood and can lead to blood clots. As a result, diabetic patients are at risk of developing peripheral artery disease, which can lower ABI values (Soelistijo, 2021). Several factors that can affect ABI in people with diabetes include gender, age, duration of diabetes, blood pressure, physical activity, and smoking habits (Rahmi & Rasyid, 2023).

Symptoms such as cold hands and feet, tingling, and numbness in patients with type II diabetes occur due to changes in peripheral circulation. In Mrs. D, peripheral circulation problems were caused by high blood glucose levels, which trigger clotting and affect platelet function (Sayed et al., 2021).

The client reported experiencing fluctuating fever and chills for 6 days before admission. The client's skin felt warm, and she appeared pale and weak. The Tubex 6 test result was positive for Mrs. D, indicating typhoid fever infection caused by the bacteria Salmonella enterica serovar (Ginting & Purba, 2023). Furthermore, the Tubex results, which showed a 25.7% increase in P-LCR, could be related to the onset of inflammation and infection, including those caused by typhus. P-LCR typically increases in response to thrombocytopenia, a condition characterised by a decreased platelet count, which often occurs in typhoid fever (Lorenza et al., 2018).

The hyperthermia experienced by Mrs. D could be caused by the long-standing risk factor of Type II DM, which can suppress the immune system, leading to an increased risk of infection. In this case, typhoid fever is a trigger for increased body temperature caused by the bacteria Salmonella enterica serovar typhi (Harreiter & Roden, 2023).

This study prioritised the diagnosis of ineffective peripheral perfusion risk because it was the primary complaint reported during the assessment. Implementing the nursing diagnosis of risk of ineffective peripheral perfusion is evidenced by hyperglycemia, namely, circulation care, checking peripheral circulation, identifying risk factors for circulatory disorders, avoiding blood pressure measurements in extremities with limited perfusion, recommending regular exercise, and teaching diet programs to improve circulation.

The evaluation results showed that the problem of ineffective peripheral perfusion could be resolved after nursing interventions. The ABI measurement increased from the ABI measurement results for the right hand and foot on the first day: 0.85, the left hand and foot: 0.84, and the ABI measurement results for the hands and feet on the third day: 0.85. Right Arm: 0.94; Left Arm and Leg: 0.97**

The patient underwent Buerger-Allen exercise therapy sessions over three days. Each session lasted for 20 minutes, taking place from 8:30 to 8:50 a.m. The therapy began with baseline systolic blood pressure measurements in the lower and upper limbs to evaluate Ankle-Brachial Index (ABI) values before the exercise commenced. Following the Buerger-Allen exercise therapy, a final measurement of the ABI was taken.

For Mrs. D, the process started with insulin therapy administered before breakfast. Buerger-Allen exercise (BAE) is a practical exercise regimen designed for individuals with

tissue perfusion problems in the legs, particularly those with diabetes. It is easy to implement, cost-effective, and beneficial.

Empowering individuals with diabetes to maintain their health and prevent macrovascular complications is crucial. This is a primary focus for nurses, as the complications faced by diabetics can pose significant burdens to them and their families. Nurses must recognize that diabetes mellitus patients who experience peripheral perfusion disorders in their feet have the potential to become independent in meeting their daily living needs, maintaining their health, and achieving overall well-being

Consistent with research conducted by Marlena, et al., (2020) Buerger Allen exercises demonstrated a normal ABI value ranging from 0.9 to 1.3. After the intervention, the average ABI value for respondents before the intervention was 0.67, while after performing the Buerger Allen exercises, the average value increased to 0.85. A bivariate analysis yielded a p-value of 0.000. This occurs because this technique utilises gravity to help improve blood circulation in the legs and involves simple movements in the leg area to stimulate muscle contractions. Based on the evaluation results conducted for three consecutive days on the first day January 7, 2025, the client complained of frequent numbness and tingling in the legs, his body felt weak, the results of the ABI measurement before the right leg and hand were 0.85 while the left leg and hand were 0.84 to 0.86 in the right leg and hand 0.87 in the left leg and hand in the post-action there was an increase in the ABI value, however, the ABI value obtained was not yet at the normal value, the GDS value was 298 mg/dl, pulse rate 101 x/minute, skin color looked pale, CRT <3 Seconds. BAE action was given along with pharmacological therapy; the client was given Novorapid 3x7 iu sc via SC and metformin 1 mg via PO. The risk of ineffective peripheral perfusion was not resolved on the first day.

On the second day, January 8, 2025, an increase was found in the right leg and hand pre-action 0.84 post-action 0.87, while in the left leg and hand pre-action 0.86 and post-action 0.88, the client's GDS value decreased from the first day, complaints of numbness and tingling in the legs were still felt, the body felt weak, the GDS value was 275 mg/dl. CRT <3 Seconds. BAE action was given along with pharmacological therapy; the client was given Novorapid 3x7 iu sc via SC and metformin 1 mg via PO. The problem of the risk of ineffective peripheral perfusion was partially resolved on the second day.

On January 9, the BAE procedure had a positive effect on a patient with peripheral perfusion risk issues. This was demonstrated by an increase in the Ankle-Brachial Index (ABI) values, which moved into the normal range. The right leg and hand showed an increase from 0.86 to 0.94, while the left leg and hand increased from 0.88 to 0.97. The patient reported a reduction in numbness and tingling in the legs, as well as decreased weakness, and the skin color was no longer pale. Additionally, the Blood Glucose Level decreased to 165 mg/dL.

The BAE procedure was performed alongside pharmacological therapy, with the patient receiving Novorapid at 3x7 IU subcutaneously and metformin at 1 mg orally. By the third day, the issue of ineffective peripheral perfusion was resolved, and the patient was discharged to their home.

Buerger Allen exercises leverage changes in gravity to positively affect the smooth muscles of the treated blood vessels, leading to beneficial outcomes. This gravitational

influence enhances blood circulation through alternating expansion and contraction (Rahmi & Rasyid, 2023). Demonstrated that Buerger Allen exercises increased peripheral blood flow, as evidenced by a rise in the ankle-brachial ABI value. This value is calculated by dividing the systolic blood pressure in the foot (dorsalis pedis) by that in the arm (brachialis) using a sphygmomanometer and Doppler (Salam A & Laili N, 2020).

The three-day Buerger Allen exercise program was specifically designed to improve blood flow in patients with lower limb problems due to poor peripheral circulation. In addition to the exercises, medical treatments to manage blood sugar levels and promote a healthy diet, specifically one low in sugar and fat, further enhance the effectiveness of the Buerger Allen exercises.

CONCLUSION

Diabetes Mellitus with nursing problems of ineffective peripheral perfusion risk, it has been proven effective, this is evidenced by an increase in the ABI score, namely before the intervention, the ABI results for the right hand and foot were 0.85 while the ABI for the left hand and foot were 0.84 after 3 days of intervention, there was an increase in the ABI results for the right hand and foot of 0.94 while the left hand and foot were 0.97. The success of the BAE intervention aligns with pharmacological therapy, including 3x7iu Novorapid insulin and 3x1 mg metformin, as well as a diet low in sugar, fat, and oily foods. BAE in Type 2 DM patients can be given to improve peripheral circulation and reduce neuropathy complaints.

SUGGESTIONS

The results of this study are expected to provide input for the Inpatient Ward at the Murai Room of Dr. Soedarso Regional General Hospital in providing services to patients with Type II Diabetes Mellitus through the application of the Buerger Allen Exercise intervention to improve peripheral blood circulation and reduce numbness and tingling in the feet.

For patients the results of this study are expected to be a source of knowledge and reference for patients regarding the application of the Buerger Allen Exercise so that it can be practiced regularly at home to improve blood circulation in the legs, reduce tingling and numbness, and assist patients in undergoing treatment, maintaining a healthy lifestyle, and undergoing frequent health checkups at health facilities.

CONFLICTS OF INTEREST

None

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THE EFFECT OF PREMARITAL SEXUAL HEALTH EDUCATION ON ADOLESCENTS' KNOWLEDGE AND ATTITUDES AT MADRASAH ALIYAH PUTRI AL-KHOIROT MALANG

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ABSTRACT

Background: Adolescents are a vulnerable group to sexual problems, which can lead to an increase in unwanted pregnancies and early marriages due to a lack of knowledge and appropriate attitudes. Premarital sexual health education serves as an important preventive effort to improve healthy knowledge and attitudes related to sexuality**.**

Purpose: This study aims to examine the effect of premarital sexual health education on the knowledge and attitudes of adolescents at Madrasah Aliyah Putri AL-Khoirot Malang.

Methods: This study used a pre-experimental design with a one-group pretest-posttest approach. A total of 67 students were selected using stratified random sampling. The instruments used were knowledge and attitude questionnaires, and the data were analyzed using the Wilcoxon test.

Results: The findings revealed a significant increase in knowledge and attitude scores after the educational intervention ($p < 0.05$).

Conclusion: Premarital sexual health education significantly improves adolescents' knowledge and attitudes toward healthy sexual behavior. Educational institutions are encouraged to integrate comprehensive sexual health education programs to prevent risky sexual behavior among youth.

Keywords: Adolescent, Health Education, Premarital Sexual.

BACKGROUND

Premarital pregnancy is a major issue that is increasingly attracting public attention. The rising number of early marriages is largely attributed to premarital pregnancies. Numerous researchers and media reports have highlighted the complexity of this problem. Premarital sexual behavior continues to increase despite adolescents being aware of the consequences of engaging in sexual relations with the opposite sex (Syafitriani et al., 2022). The number of adolescents in Indonesia engaging in premarital sexual activity continues to rise, even though the government has implemented various efforts to reduce it (Shakti et al., 2022).

According to UNICEF, 1,078 adolescents who are still in school have given birth, with 976 of those births being unintended (Hasibuan, 2022). Currently, there are approximately 1.2 billion adolescents worldwide, accounting for one-sixth of the global population. This number is projected to continue increasing until 2050, particularly in low- and middle-income countries, where nearly 90% of the population aged 10–19 resides.

In Indonesia, there are 45.351 million individuals, or 16.92% of the total population, aged 10–19 years, according to data from the Central Statistics Agency (BSP). In East Java Province, the number of marriage dispensation requests (Diksa) in 2022 reached 15,212 cases. The three religious courts with the highest number of cases were the Religious Court of Jember with 1,388 decisions, followed by the Religious Courts of Malang and Kraksaan, each with 1,384 decisions. According to Maria Ernawati, Head of the East Java Provincial Representative Office of BKKBN, the viral case involving hundreds of pregnant students in Ponorogo before marriage is just the tip of the iceberg. This is supported by the 15,121 marriage dispensation decisions issued by the Surabaya High Religious Court in 2022 (Kominfo, 2023).

A case that occurred in Malang Regency is a real example of the importance of sexual health education for adolescents. A 17-year-old student from Kromengan District was found to be pregnant after undergoing a random pregnancy test at her school (Radar Malang, 2024). She admitted to having had sexual relations with her partner, who was also underage. Although the couple had undergone a religious (unregistered) marriage, the relationship ended in abandonment, eventually leading to a report being filed with law enforcement. This case highlights the urgent need for preventive efforts through early sexual health education, particularly in formal education settings.

Another recent case emerged at an Islamic boarding school (pesantren) in Gondanglegi District, Malang Regency, East Java, where a caretaker with the initials BT (45) was named a suspect for allegedly molesting a female student ten times (Detikcom, 2024). The victim experienced trauma and was forced to leave the pesantren. This incident reveals the lack of supervision and inadequate sexual health education in religious-based institutions. In fact, appropriate sexual education can prevent abuse and protect children from manipulation (Siregar, 2021). The Indonesian Child Protection Commission (KPAI, 2022) also reported a rise in child abuse cases in educational institutions, including pesantrens.

The 2020 Indonesian Adolescent Reproductive Health Survey (SKRRI) showed that approximately 6.1% of male adolescents and 1.5% of female adolescents aged 15–19 years in Indonesia had engaged in touching or stimulating their partners; 53.8% of male adolescents

and 36.7% of female adolescents had experienced kissing on the lips; and 85.4% of male adolescents and 78.1% of female adolescents had held hands with their partners (BKKBN Public Relations and General Affairs Bureau, 2021). Educators must consistently provide health promotion information on sexual health issues such as premarital sex, HIV/AIDS, abortion, unwanted pregnancy, and other sexually transmitted diseases to prevent students from encountering sexual and mental health problems (Syam, 2020). Unmarried pregnancy can occur due to promiscuity, lack of self-control, lack of parental attention and supervision, and limited sexual knowledge (Alifah et al., 2022).

Based on a preliminary study conducted by the researcher on November 12, 2024, at Madrasah Aliyah Putri AL-Khoirot Malang, interviews with 5 female students revealed that three of them understood the examples and consequences of premarital sexual behavior, while two students had limited understanding regarding such behaviors and their potential consequences.

Based on the phenomenon of premarital sexual behavior frequently experienced by adolescents today and the results of preliminary surveys indicating a lack of previous research on this specific topic, the researcher was motivated to conduct a study entitled "The Effect of Premarital Sexual Health Education on Adolescents' Knowledge and Attitudes at Madrasah Aliyah Putri AL-Khoirot Malang.

OBJECTIVE

This study aims to examine the effect of premarital sexual health education on the knowledge and attitudes of adolescents at Madrasah Aliyah Putri AL-Khoirot Malang

METHODS

This study employed a pre-experimental design using a one-group pretest–posttest approach to evaluate the effectiveness of a premarital sexual health education intervention. The study was conducted at Madrasah Aliyah Putri Al-Khoirot, Malang, East Java, Indonesia, from March to June 2025.

The study population consisted of 203 female students enrolled at Madrasah Aliyah Putri Al-Khoirot. A stratified random sampling technique was applied, resulting in a total of 67 respondents. The inclusion criteria were active female students who were willing to participate and provided informed consent. Exclusion criteria included students who had received a similar educational program within the previous 12 months, those who did not complete the study until the final stage, and those with diagnosed mental or cognitive disorders.

Data were collected using a structured questionnaire comprising 20 items designed to assess participants' knowledge and attitudes related to premarital sexual health. The intervention consisted of premarital sexual health education delivered through oral presentations supported by PowerPoint media. The program was conducted in four sessions over four consecutive weeks, with one session per week. Each session included group discussions to facilitate participant engagement, experience sharing, and clarification of questions. The intervention was delivered by the research team.

Data analysis was performed using the Wilcoxon Signed-Rank Test to compare pretest and posttest scores, as the data were non-parametric. Statistical significance was determined at an appropriate level.

Ethical approval for this study was obtained from an authorized ethics committee. Additional permissions were secured in accordance with local research governance requirements. All participants were informed about the study objectives and procedures, and written informed consent was obtained prior to data collection. Participant confidentiality and anonymity were strictly maintained. The full name of the approving institution and the ethics approval number are provided on the title page.

RESULTS

Tabel 1. Classification of Respondent Characteristics Based on Age of Female Students at Madrasah Aliyah Putri AL-Khoirot Malang (n = 67)

Respondent Characteristics	Frequency	Presentation
15-16 years old	33	49,3%
17-19 years old	34	50,7%
Total	67	100%
Class X	32	47,8%
Class XI	35	52,2%
Total	67	100%

(Source data: 2025)

Based on the data presented in Table.1, the distribution of respondent characteristics in this study shows that the majority were in the 17–19 age group, with 34 respondents (50.7%). In terms of class level, the majority were from Grade XI, totaling 35 respondents (52.2%).

The data on students' knowledge and attitude levels before receiving premarital sexual health education were obtained from the results of questionnaire distribution by the researcher. The detailed distribution of knowledge and attitude levels among all respondents can be seen in the following table:

Table. 2 Distribution of Knowledge and Attitude Levels Before Receiving Premarital Sexual Health Education (N = 67)

Variable	criteria	Frequency	Presentation
Knowledge	Poor	2	3,0%
	Fair	65	97,0%
	Good	-	-
Total		67	100%
Attitude	Poor	3	4,5%
	Fair	64	95,5%
	Good	-	
Total		67	100%

Based on the results in Table.2, the data show the knowledge and attitude levels of female students before receiving premarital sexual health education. Of the total 67 students, the majority had a fair level of knowledge, with 65 students (97.0%). Meanwhile, for the attitude variable, 64 students (95.5%) demonstrated a fair level of attitude.

Table. 3 Distribution of Knowledge and Attitude Levels Among Female Students After Receiving Premarital Sexual Health Education (n = 67)

Variable	Criteria	Frequency	Presentation
Knowledge	Poor	-	-
	Fair	4	6,0%
	Good	63	94,0%
Total		67	100%
Attitude	Poor	-	-
	Moderate	40	59,7%
	Good	27	40,3%
Total		67	100%

Based on Table 3, it can be seen that the distribution of knowledge and attitude levels among female students after receiving premarital sexual health education showed a significant improvement in knowledge, with 63 students (94.0%) categorized as having good knowledge. In terms of attitude, 40 students (59.7%) were still categorized as having a fair attitude.

Tabel 4. results of the Wilcoxon Signed-Rank Test Analysis on Knowledge and Attitude Levels Before and After Premarital Sexual Health Education (n = 67)

Knowledge	*p*-value
Pre test	**0,000**
Post test	
Attitude	
Pre test	0,000
Post test	

Based on table 4, the knowledge and attitude levels of female adolescents before (pre-test) and after (post-test) receiving premarital sexual health education both showed a p-value of 0.000. It can be concluded that $0.000 < 0.05$, which indicates a significant effect of premarital sexual health education on the knowledge and attitudes of adolescents at Madrasah Aliyah Putri AL-Khoirot Malang.

DISCUSSION

This study found that premarital sexual health education has a significant influence on adolescents' knowledge and attitudes. The findings support the notion that educational interventions are effective in improving students' understanding of reproductive health issues and shaping their perspectives toward responsible behavior. The relationship between knowledge and attitude is closely interconnected as adolescents gain more accurate and structured information, their attitudes tend to become more positive and preventive in nature.

These results align with previous studies such as those by Syam (2020), which emphasize the importance of continuous health promotion regarding issues such as premarital sex, sexually transmitted infections, and unwanted pregnancy. Education that is structured, culturally sensitive, and age-appropriate is proven to be effective in reducing risky behaviors among adolescents. Moreover, Siregar (2021) noted that a lack of sexual education contributes to increased vulnerability to manipulation and violence, especially among adolescents in environments with limited access to formal health education.

In the context of this study, female students who initially had limited knowledge and moderate attitudes showed notable improvement after receiving targeted education. This suggests that sexual health education is not only informative but transformative, particularly when delivered in environments where such topics are often taboo or under-discussed, such as religious-based schools.

Furthermore, the findings reflect the iceberg phenomenon described by BKKBN (2023), where visible cases of adolescent pregnancy represent only a fraction of the broader issue. Providing early education could play a crucial role in equipping students with the awareness and critical thinking needed to make safe, informed decisions

CONCLUSION

Premarital sexual health education had a positive impact on the respondents' knowledge and attitudes. There was an improvement in knowledge from the moderate to good category, and an improvement in attitude from the poor to moderate category.

Premarital sexual health education plays a pivotal role in shaping adolescents' knowledge and attitudes, making it a key preventive measure in addressing reproductive health challenges among youth.

Future studies should be added control group to examine comparison with intervention group and using larger sample. Involving other Madrasah Aliyah in Malang or other districts to see if the results are consistent in different cultural contexts. Adding a long-term follow up to ensure if the knowledge and attitude persist.

ACKNOWLEDGMENTS:

CONFLICTS OF INTEREST

There is no conflict of interest in this study

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THE EFFECT OF QUARTED CARD SNAKES AND LADDER THERAPY ON PATIENTS WITH SOCIAL ISOLATION PROBLEMS IN SCHIZOPHRENIA AT THE BINA LARAS SOCIAL REHABILITATION UNIT IN PASURUAN

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ABSTRACT

Background: Social isolation is a common nursing problem experienced by patients with schizophrenia, characterized by decreased ability to interact, withdrawal, and minimal communication with others. Effective nursing therapy is needed to improve patients' social skills, one example of which is group activity therapy using the Snakes and Ladders Quartered Card Game.

Purpose: To determine the effect of providing Quarted Card Snakes and Ladders therapy on the socialization skills of Mr. Y with social isolation nursing problems at the Bina Laras Pasuruan Social Rehabilitation Unit.

Methods: This research method used a case study approach on one patient with social isolation issues. The intervention, in the form of Quartered Card Snakes and Ladders therapy, was carried out for two days, once per day for approximately 45 minutes. Data were collected through interviews, observation, and documentation. Evaluation of social skills was conducted before and after the intervention using observation sheets in accordance with the Indonesian Nursing Diagnosis Standards (IDHS) and the Indonesian Nursing Outcome Standards (SLHS).

Results: Evaluation results showed an improvement in Mr. Y's social skills after therapy. The patient began to make eye contact, introduce himself, participate in games, answer questions, and interact with group members. The patient appeared more confident and active in two-way communication compared to before the intervention. This study was limited by a single-patient case study, a short intervention duration, and the absence of a control group, which restrict the generalizability of the findings.

Conclusion: The Snakes and Ladders Quartered Card Therapy has impact social skills in socially isolated patients. This intervention can be used as an alternative to group activity-based psychiatric nursing therapy to enhance social interaction in patients in social rehabilitation facilities.

Keywords: Group Activity Therapy, Schizophrenia, Social Isolation, Snakes And Ladders, Quartered Cards.

BACKGROUND

Schizophrenia is a mental disorder characterized by serious disturbances in thought patterns, emotional responses, and behavior. Individuals with schizophrenia often exhibit disorganized thinking patterns, difficulty maintaining focus and attention, and inappropriate or flat emotional responses. Motor function disorders are also common. This condition can lead sufferers to become immersed in a fantasy world filled with delusions and hallucinations. These symptoms can significantly impact the quality of life of those with schizophrenia (Kustiawan et al., 2023).

According to the World Health Organization (2022), 300 million people worldwide suffer from mental disorders such as depression, bipolar disorder, and dementia, including 24 million people with schizophrenia. This is lower than the prevalence data for mental disorders. Based on the 2018 Basic Health Research (Riskesdas) in Indonesia, the prevalence of mental disorders reached 7% per 1,000 people, while the prevalence for mental disorders in people over 15 years of age averaged 9.8%. According to Riskesdas (2020), 9% of the Indonesian population faces mental health problems. In East Java, the Health Office profile noted that 0.79% of 47,561,817 people experienced similar mental disorders. According to Health Office data, the number of people with mental disorders in Malang Regency in 2021 was 4,970 people.

One of the nursing problems that frequently arises in patients with schizophrenia is social isolation. Social isolation is a condition in which an individual experiences a decreased ability to interact with others, withdraws from social environments, and avoids communication due to feelings of unacceptance, distrust, or anxiety in relationships (Keliat, 2020). Patients with social isolation tend to exhibit quiet behavior, lack eye contact, not participate in activities, and have difficulty communicating. This, if left untreated, can worsen the patient's social functioning and quality of life.

Nursing efforts to address social isolation require effective interventions that can gradually facilitate patients' socialization skills. One recommended intervention in psychiatric nursing is Group Activity Therapy (GAT). GAT is a nursing intervention that aims to improve social interaction skills through structured, directed, and tiered group activities tailored to the patient's abilities (PPNI, 2019). The GACT model is designed to help patients develop interpersonal, communication, and collaboration skills, as well as increase self-confidence through involvement in social activities.

Group-based educational games are an effective approach in TAK because they can increase motivation, engagement, and interaction among group members. The Snakes and Ladders Quartet Card Game is an innovation in TAK that combines elements of educational card games and board game activities to enhance communication, cooperation, and socialization. This game provides learning experiences through interaction, discussion, and turn-taking and decision-making within the group, helping patients gradually build social connections.

Although numerous studies have demonstrated the effectiveness of Group Activity Therapy in improving socialization, the use of the Snakes and Ladders Quartet card game is still rarely implemented in mental health care facilities, particularly in social rehabilitation units. Thus, there is a gap in nursing practice regarding innovative Group Activity Therapy media for improving the social skills of patients with social isolation.

OBJECTIVE

The purpose of this case study is to analyze the application of Group Activity Therapy through the Snakes and Ladders Quartet Card game to improve the socialization skills of patients with social isolation.

METHODS

Study Design

The design of this research is a case study. With one subject at the Pasuruan Regional Public Health Service Unit (UPT RSBL) in Pasuruan. The subjects were selected using a non-probability sampling method with typical purposive sampling. Purposive sampling is a non-random sampling method in which researchers select subjects based on specific criteria relevant to the research objectives (Suriani et al., 2023).

Setting

This research was conducted from October 20 to November 1, 2025, at the Bina Laras Social Rehabilitation Unit (UPT)..

Research Subject

The design that the researcher compiled used a case study where the research subjects were 1 managed patient and 7 people with social isolation patients to carry out group activity therapy at the UPT RSBL Pasuruan. The researcher will select the research subjects using a non-probability sampling method with typical purposive sampling. Purposive sampling is a non-random sampling method in which the researcher selects subjects based on specific criteria relevant to the research objectives (Suriani et al., 2023). The criteria for selecting research subjects are as follows:

 A. Inclusion Criteria :
   1. Patiens with social isolation : with drawal (mild to moderate).
   2. Able to follow simple instructions.
   3. Able to communicate in two directions,
   4. Desire to interact.
 B. Exclusion Criteria :
   1. Patients with aggressive behavior.
   2. Refusal to participate.
   3. In the acute phase of psychotic disorder (severe hallucinations, delusions).

Instruments

This study collected data in three ways: interviews, observation, and documentation. In addition to collecting data from patients, there were further steps in this study, namely the preparation stage and the implementation stage.

Data Analysis

Case study research involves several steps in data collection:
 1. Conducting anamnesis and direct observation of respondents.

2. Prioritizing nursing problems based on the data obtained, then developing a nursing care management plan for patients with schizophrenia, focusing on social isolation.
3. Implementing the planned nursing actions, including how to interact with other using strategy for implementing nursing actions and snakes and ladders card game therapy.
4. Evaluating the actions taken based on the outcome criteria: the patient is able to interact with other.

Ethical Consideration

According to Yumesri et al. (2024), research must be conducted with a focus on professionalism and honesty. Efforts made in research aim to gain respect and trust, both from the general public and from the research participants themselves.

RESULTS

A client identified as Mr. Y, a 39-year-old male diagnosed with schizophrenia, presented with social isolation issues prior to intervention. He appeared withdrawn, rarely made eye contact, did not engage in conversation, and preferred to remain alone and not participate in group activities.

The intervention was provided in the form of Group Activity Therapy, Socialization Stimulation using the Snakes and Ladders Quartet Card Game, for two sessions on two consecutive days, each lasting approximately 45 minutes. The first session focused on self-introduction, game rules, and basic interaction exercises, while the second session focused on increasing active participation, two-way communication, and cooperation within the group.

Figure 1 Socialization Stimulation

After the two intervention sessions, the client demonstrated positive changes in socialization. By the end of the second session, he began to initiate greetings with group members, made eye contact, communicated effectively, and actively participated during the game. He also appeared more confident and displayed positive emotional expressions, such as smiling and laughing when interacting with group members.

Figure 2 Socialization Stimulation

DISCUSSION

Mr. Y, a 39-year-old patient, diagnosed with social isolation, was treated at the Pasuruan Social Rehabilitation Unit (RSBL). The main objective of the intervention was to help the patient interact better with others without fear through a combination of psychiatric nursing strategies and group activity therapy playing snakes and ladders. On the first day, October 20, 2025, at 11:00 a.m. during the assessment, the patient appeared restless and tended to isolate himself from his surroundings. During the observation, the patient did not show any social interaction with peers. In addition, during the therapeutic interaction session, the patient appeared to have difficulty maintaining focus in the conversation. The patient was willing to communicate but only spoke in short sentences. At this stage, the researcher was still unable to successfully implement the conversational strategy.

The researcher assumed that on the first day, the participant was still in the process of building trust, therefore it took more time to build a therapeutic relationship. On the second day, the researcher conducted an assessment with a focus on building a relationship of mutual trust and identifying the causes of social isolation and asking about the advantages and disadvantages of interacting, but at this meeting the researcher had not yet obtained data on the causes of social isolation and the patient had not been able to get to know the researcher, only mentioning his nickname. On the third day, the patient was able to build trust with the researcher, the patient was able to communicate with the researcher about what caused him to isolate himself.

On the fourth day, the researcher taught the patient how to get acquainted with one nurse, Nurse A. At this meeting, the patient was not yet able to demonstrate how to get acquainted properly, still afraid, but the patient was able to state his name, hobbies, and where he was from. Thus, the researcher included conversation activities in the patient's daily schedule. On the fifth and sixth days, the focus was on practicing getting acquainted and talking with others. At this meeting, the patient was able to get acquainted and talk well, with a clear voice but still lacked eye contact. On the seventh day, the intervention continued with getting acquainted and talking with others. At this meeting, the patient was able to get acquainted well, and communicated beyond just asking for names. The patient was able to communicate broadly with his peers.

On the seventh and eighth days, the intervention continued with group activity therapy using the Snakes and Ladders Quartet Card Game. The activity was carried out for two consecutive days, with a duration of 45 minutes per session. The therapy was carried out through a Snakes and Ladders game with pictures on some boxes. If the participant stopped on a box with a picture of a card, they were asked to draw a quartet card containing simple instructions, such as introducing themselves, getting to know the person next to them, and other social activities aimed at practicing socialization skills. The results of the activity initially at the first meeting, the patient appeared tense and inactive, then at the second meeting the patient experienced changes and was able to socialize with other patients.

At the nursing evaluation stage, based on the observation results, social isolation behavior after snakes and ladders therapy and card games (quartet) was found that the patient experienced changes in social behavior indicating a decrease in social isolation behavior in the patient's non-verbal aspects. Nonverbal aspects observed in group activity therapy activities

such as eye contact, sitting position, body language, participating in activities and being able to practice, the patient initially still had less interaction but on the 2nd day there were social changes in terms of non-verbal aspects.

The results of observations conducted by the group where on the first day of the game the patients still showed social isolation behavior where some patients refused to answer some questions, interact with other patients and only focused on themselves. While on the second day the patients had started to interact to play snakes and ladders and asked for cards from other patients, answered questions on the cards and patients thanked other patients when given cards. This shows that as the days go by the patients feel comfortable with each other and there is socialization with each other. The results of another study by Hastuti & Hardyana (2019) with the title The Effect of Implementing TAK: Quartet Game on Socialization Skills in Social Isolation Patients showed that the ability to interact socially in patients before the intervention was 6 people (46.2%) moderate and 7 people (53.8%) poor socialization skills then the ability to interact socially in respondents after the intervention increased where 10 people (76.9%) had good socialization skills, 2 people (15.4%) had moderate socialization skills, and a decrease in poor socialization skills to 1 person (7.7%).

Group activity therapy has an impact on social interactions in socially isolated patients, as found in this study. Regularly playing snakes and ladders and card games (quartets) can improve interactions with others without fear. Snakes and ladders and card games (quartets) focus on improving patients' social skills and reducing signs and symptoms. Improved social skills can occur because patients have practiced and trained in ways to improve their social skills.

Based on observations, when given therapy playing snakes and ladders and card games (quartet), patients communicate more with their environment. Because during the procedure of therapy playing snakes and ladders and card games (quartet), patients must be polite, say thank you when given a card, and read the contents of the card they have to the group. Therapy playing snakes and ladders and card games (quartet) is also done in groups to facilitate patients in socializing, so that group activity therapy, guessing picture therapy and card games (quartet) given in groups can improve socialization skills in socially isolated patients.

CONCLUSION

Group activity therapy using the Snakes and Ladders card game Quartet has been shown to have a positive impact on improving social skills in patients with social isolation. After two sessions of intervention, patients demonstrated improvements in eye contact, initiative in interactions, two-way communication, and active participation in group activities. Furthermore, patients appeared more confident and were able to express positive emotions, such as smiling and laughing, when interacting with group members.

These findings support the theory that Group Activity Therapy is an effective intervention for improving interpersonal skills and social functioning in patients with schizophrenia and social isolation. The applied group activity therapy model serves as an adequate conceptual guide for helping patients develop social skills through structured and interactive activities. The data obtained in this study also confirms that the educational play approach can facilitate gradual social adaptation while enhancing the therapeutic relationship between nurses and patients.

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CONFLICTS OF INTEREST

The authors declared that they have no conflict of interest.

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