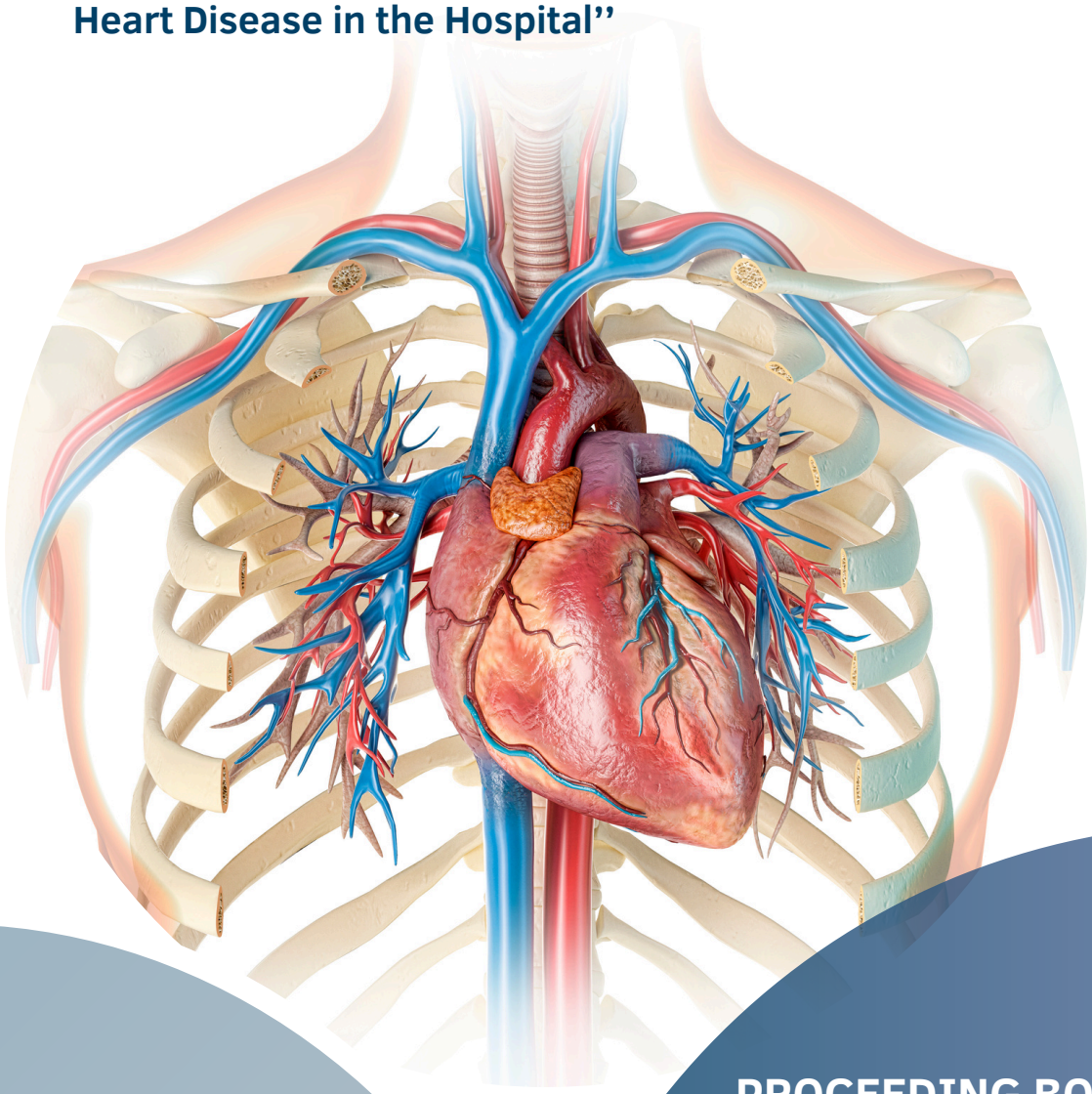
Kemenkes Poltekkes Surakarta

Poltekkes

9TH International Nursing Conference

THE 9TH INTERNATIONAL NURSING CONFERENCE

''Advancements in Cardiovascular Care for Patient with Heart Disease in the Hospital''



PROCEEDING BOOK

ISBN 978-602-52712-9-8

Editor

- Rendi Editya Darmawan, M.Kep
- Alifia Citra Nagari
- Claresta Gamar D.P.B
- Syahnaz Aina Salsabilla
- Rizky Ivan Saputra

Reviewer

- Dr. Dyah Dwi Astuti, S.Kep., Ns., M.Kep,Sp.Kep.An.
- Ratna Wirawati Rosyida, S.Kep., Ns., M. Kep
- Suyanto, S.Kp., M.Kes

TABLE OF CONTENTS

PROGRAM

9th INTERNATIONAL NURSING CONFERENCE (9th INC)

THE SCHOOL OF NURSING OF HEALTH POLYTECHNIC SURAKARTA 2025

"Advancements in Cardiovascular Care for Patient with Heart Disease in the Hospital"

Day and Date : Tuesday, September 16th, 2025

Place : Zoom Cloud Meetings and Balai Krida Husada Health Polytechnic Of Surakarta

Time (UTC+7)	Activities
06.30 am – 07.00 am	REGISTRATION OPEN
07.00 am – 07.05 am	Safety Briefing
07.05 am – 07.10 am	NLC Practical Lab Equipment Demonstration Video Presentation
07.10 am – 07.20 am	Opening Performance
07.20 am – 07.25 am	Opening Master of Ceremony
07.25 am – 07.35 am	Sing the National Anthem Indonesia Raya, Mars of Poltekkes Surakarta and Mars of PPNI
07.35 am – 07.40 am	Report from Head of Committee
07.45 am – 07.50 am	Opening Speech by Director of Health Polytechnic of Surakarta
07.50 am – 07.55 am	Prayer Sessions
07.55 am – 08.00 am	Closing by Master of Ceremony and Introduction of the Moderator
08.00 am – 08.30 am	SESSION 1 Keynote Speaker Yunita Dyah Suminar, SKM, M.Sc, M. Si Head of the Central Java Provincical Health Office
08.30 am – 08.50 am	Speaker 2 Fina Mahardini, S.Kep., Ns., M.Kep. The School of Nursing, Health Polytechnic of Surakarta, Ministry of Health, RI **"Bridging Heart and Hormones: Advancements in Cardiovascular Care for Patients with Diabetes and Metabolic Syndrome**

08.50 am – 09.00 am	Discussion
09.00 am – 09.20 am	Speaker 3 Dr. Sugiyarto, SST.Ns., M.Kes. The School of Nursing, Health Polytechnic of Surakarta, Ministry of Health, RI **"Skili Improvement to save Lives Cardio pulmonary Resuscitation (CPR) and Basic Life Support (BLS)"**
09.20 am – 09.30 am	Discussion
09.30 am – 09.50 am	Speaker 4 Prof. Hsing Mei Chen, PhD.,RN National Cheng Kung University, Taiwan **"Post Resuscitation Care and Rehabilitation for Heart Attack Survivors"**
10.20 am – 10.30 am	Discussion
10.30 am – 10.50 am	Speaker 5 Jiroh Xian Leano, RN. LSSGB.,CLSSYB. SBLC (St. Bernadette Of Lourdes College) Philippines **"Shaping the Future of Cardiovascular Care: Nursing Perspectives on the Latest Advances in Heart Disease Management"**
10.50 am – 11.00 am	Discussion
11.00 pm – 11.50 pm	Speaker 6 Ms. Oon Siow Eng Nurse, Clinican, Cardiothoracic Intensive Care Unit (CTICU) National University Heart Centre, Singapore **"Latest Developments in Technology and Innovation in the Field of Emergency Cardiology"**
11.50 pm – 12.00 pm	Discussion

12.00 am – 12.50 pm	BREAK
12.50 am – 01.00 pm	NLC Practical Lab Equipment Demonstration Video Presentation
01.00 pm – 01.50 pm	SESSION 2 Speaker 7 Sabine Pieter, RN, MSc Zuyd University of Applied Sciences, Netherlands **"The Interprofessional Collaboration in Managing Heart Disease and the Challenges"**
01.50 pm – 02.00 pm	Discussion
02.00 pm – 02.50 pm	Speaker 8 Prof. Maria Isabelita C. Rogado Arellano University - Graduate School of Nursing President, Critical Care Nurses Association of the Philippines, Inc. Secretary, World Federation of Critical Care Nurses **"Improving the Quality of Emergency and Intensive Heart Disease Services"** **(the topic is underconfirmation)**
02.50 pm – 03.00 pm	Discussion
03.00 pm – 03.50 pm	Speaker 9 Ns. Ryan Budianto, S.Kep.,M.Kep. National Cardiovascular Center Harapan Kita **“Advancements in Cardiovaskular Care for Patient with Heart Disease in the Hospital”**
03.50 pm – 04.00 pm	Discussion
04.00 pm – 04.10 pm	Closing Master of Ceremony

Original Research

THE EFFECT OF KEGEL EXERCISE ELDERLY TRAINING (KEET) ON URINARY INCONTINENCE IN THE ELDERLY BASED ON WEBSITE

Ira Alfina Putri Asih 1, Rendi Editya Darmawan 2, Ratna Wirawati Rosyida 3

1,2,3 Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia

ABSTRACT

Background: Urinary incontinence is often experienced by someone due to muscle weakness, making it easy for the bladder to open and close accidentally. **Objective:** To determine the effect of Kegel Exercise Elderly Training (KEET) on urinary incontinence in the elderly based on the Website. **Method**: Quantitative research design, pre-experimental with a one-group pre-test post-test design. Purposive sampling technique, obtained a total of 30 respondents. Data analysis using the Wilcoxon test. This research was conducted at the respondents' homes during 4 meetings.

Results: The results showed that 24 respondents (80%) experienced severe urinary incontinence, while 6 respondents (20%) experienced moderate urinary incontinence. The related factors were age, gender, and comorbidities. These results suggest that Kegel exercises have no effect on reducing urinary incontinence.

Conclusion: The conclusion of the study shows that there is no effect of implementing a website-based KEET programme in reducing urinary incontinence in elderly health centres in the working area of the Gilingan Community Health Centre in Surakarta City.

ARTICLE HISTORY
Received: September, 15 2025
Accepted: September, 19 2025

KEYWORDS
Urinary incontinence, Kegel exercise elderly training (KEET) action, website-based.

CONTACT
Ira Alfina Putri Asih
alfipusih99@gmail.com
Department of Nursing Poltekkes Kemenkes Surakarta, Jln. Letjen Sutoyo, Mojosongo, Surakarta, Indonesia

INTRODUCTION

Urinary incontinence is a major health concern recognized by the World Health Organization (WHO) and the International Continence Society (ICS) as a complex disorder with broad medical, social, economic, and hygienic implications. It is defined as the involuntary loss of urine that is objectively demonstrable and creates a hygienic or social problem for the individual. Although often trivialized or perceived as a normal part of aging, urinary incontinence is in fact a pathological condition that requires medical attention, early detection, and appropriate management. The condition can occur in varying degrees of severity, ranging from occasional leakage during physical exertion to complete inability to control urination, and has profound consequences for individuals and healthcare systems alike. Globally, urinary incontinence is estimated to affect around 200 million people, making it one of the most prevalent health conditions in older populations. Epidemiological data demonstrate that the prevalence increases with age and disproportionately affects women due to hormonal changes, obstetric history, and pelvic floor muscle weakness. Among older women, prevalence rates are reported to range between 25–45%, while men are also affected, particularly those with prostate-related conditions or neurological disorders (Aoki et al., 2018). In Southeast Asia, studies have highlighted that urinary incontinence is underdiagnosed and underreported due to cultural stigma, shame, and lack of awareness. In Indonesia, recent reports show that 5.8% of the elderly population experience

urinary incontinence (Ruli Fatmawati et al., 2024), which, when extrapolated to the growing elderly demographic, represents a significant public health issue. With the rapid demographic transition towards an aging population, these figures are expected to rise, further emphasizing the need for preventive and promotive interventions.

The impact of urinary incontinence extends far beyond the physical symptoms of uncontrolled leakage. It profoundly affects the psychosocial well-being and quality of life of older adults. Many individuals with incontinence experience embarrassment, shame, and loss of self-confidence, often leading to social withdrawal and reduced participation in family and community activities. The condition has been associated with higher rates of depression, anxiety, loneliness, and decreased life satisfaction (Mihaľová et al., 2022). In severe cases, urinary incontinence contributes to functional decline by restricting mobility, increasing the risk of falls, and exacerbating frailty. Moreover, the economic burden is considerable, involving costs for diagnosis, treatment, absorbent pads, and institutional care. At the societal level, the stigma attached to incontinence further marginalizes older adults, creating barriers to help-seeking behaviors and reinforcing feelings of isolation.

The risk factors for urinary incontinence are multifactorial. Aging itself is associated with decreased bladder capacity, reduced urethral sphincter strength, and loss of pelvic floor muscle tone. In women, menopause contributes to hormonal decline and weakening of supportive tissues, while obstetric history, such as vaginal delivery and trauma, increases susceptibility. Other risk factors include obesity, diabetes mellitus, hypertension, chronic respiratory problems, urinary tract infections, dementia, pelvic organ prolapse, and gynecological conditions. In men, prostate surgery, benign prostatic hyperplasia, or neurological conditions such as Parkinson's disease and stroke are common contributors. Lifestyle factors such as physical inactivity, caffeine intake, and use of medications, including diuretics and hormone replacement therapy, also exacerbate the condition. Pathophysiologically, urinary incontinence results from a disruption of the complex coordination between the bladder, urethra, pelvic floor, and nervous system (Aoki et al., 2018). These diverse mechanisms explain why urinary incontinence often requires individualized, multifaceted management strategies.

Management approaches for urinary incontinence range from conservative non-pharmacological methods to pharmacological and surgical interventions. For elderly individuals, especially in community settings, non-pharmacological interventions are often the preferred first-line strategy due to their safety, affordability, and accessibility. Among these, Pelvic Floor Muscle Training (PFMT), commonly referred to as Kegel exercises, has long been recommended as an effective therapy. PFMT works by strengthening the pelvic floor muscles, thereby improving bladder and urethral support, increasing urethral closure pressure, and enhancing continence control. Multiple studies have demonstrated its effectiveness in reducing the frequency of urine leakage, improving muscle tone, and enhancing quality of life (Angelini, 2017; Abu Raddaha & Nasr, 2022; Hagen et al., 2020). However, its success depends heavily on adherence, proper technique, exercise intensity, and program duration. Research findings remain varied: while some studies report significant symptom reductions, others show minimal or no benefit, often due to poor adherence, insufficient supervision, or short intervention durations (Koerniawan et al., 2020).

In recent years, technological innovations have been increasingly applied to support and enhance traditional health interventions, including urinary incontinence management. Digital-based approaches such as mobile applications, wearable sensors, and web-based platforms have emerged as promising strategies to improve adherence and overcome barriers to care. These platforms can provide step-by-step instructional modules, interactive exercise videos, educational resources, reminders, and remote consultation services, making interventions more accessible, especially for individuals in remote or resource-limited areas

(Jaffar et al., 2022). Technology-based interventions also enable healthcare professionals to monitor adherence, provide feedback, and encourage motivation, thus bridging the gap between clinical supervision and self-directed training. However, despite their potential, digital interventions are not without challenges. The extent to which elderly individuals can benefit from these innovations is influenced by digital literacy, physical limitations, motivation levels, and family support. Many older adults face difficulties in using smartphones or navigating websites, which may limit the usability of digital platforms. In this regard, family members and community health workers play a crucial role in providing technical assistance, encouragement, and reinforcement. Research by Le Berre et al. (2023) and Hayati et al. (2024) suggests that digital interventions are more successful when combined with social support systems and hybrid models that integrate digital platforms with face-to-face guidance. This ensures not only better adherence but also greater engagement and sustainability of health outcomes.

With in this context, the Website-Based Kegel Exercise Elderly Training (KEET) program was developed as a digital health innovation designed to deliver structured Kegel exercise training for elderly individuals. KEET integrates instructional videos, educational modules, and remote consultation features, aiming to increase accessibility, encourage consistency, and improve self-care practices. By situating KEET within the community health framework, this study seeks to evaluate its feasibility and potential effectiveness in managing urinary incontinence among elderly populations in Indonesia. Unlike conventional in-person interventions, KEET leverages digital media to reach older adults in their homes, thus reducing barriers related to mobility and healthcare access. Based on the growing prevalence of urinary incontinence and the pressing need for scalable, sustainable interventions, this study aims to determine the effect of KEET on urinary incontinence outcomes among elderly individuals. The findings are expected to make several contributions: first, to expand the evidence base on the feasibility of digital health interventions in geriatric populations; second, to provide practical insights into the role of technology in promotive and preventive healthcare; and third, to serve as a reference for policymakers and healthcare professionals in developing community-based strategies to address urinary incontinence. Ultimately, this research highlights the importance of combining evidence-based exercise programs with innovative digital delivery methods to improve the quality of life, independence, and dignity of elderly populations in Indonesia and beyond.

RESEARCH

This study employed a quantitative research approach using a single-group pre-test post-test pre-experimental design. The choice of this design was based on its suitability for evaluating the preliminary effectiveness of a new intervention within a limited community setting. Specifically, it allowed researchers to assess whether the Website-Based Kegel Exercise Elderly Training (KEET) program could provide measurable benefits for urinary incontinence in elderly individuals. By comparing participants' conditions before and after the intervention, this design offered valuable insight into the feasibility and potential impact of KEET as an innovative digital health tool for managing urinary incontinence among older adults. The research was conducted in 2025 in the working area of the Gilingan Community Health Centre, Surakarta. The study population consisted of 40 elderly individuals residing in the community. Using a purposive sampling technique, a final sample of 30 respondents was selected, as they met predetermined inclusion criteria. These criteria required participants to be aged between 60 and 80 years, to experience urinary incontinence symptoms, to demonstrate willingness and cooperativeness in participating in the program, and to own or have access to a smartphone for navigating the KEET website. To ensure the

appropriateness of the intervention, participants were also required to be free from neurological disorders that could interfere with exercise performance and to provide informed consent prior to involvement. Exclusion criteria were applied to maintain data validity and included terminal illnesses, severe physical disabilities, or unwillingness to comply with the study protocol.

The KEET intervention program was structured around the use of a dedicated website as the primary platform for health education and training. This platform provided instructional exercise videos, educational modules on pelvic floor health, and remote consultation services via WhatsApp to ensure ongoing communication between participants and facilitators. To improve accessibility and accommodate the specific needs of elderly participants, intervention sessions were conducted directly at their homes. Each respondent participated in four sessions, with each session lasting approximately 15 to 30 minutes. During these sessions, participants were guided to perform 4 to 10 pelvic floor contractions per cycle, following standardized procedures outlined in a Standard Operating Procedure (SOP) for Kegel exercises. In addition to instructional content, the KEET website functioned as a motivational and feedback tool, encouraging consistency and accuracy in performing the exercises.

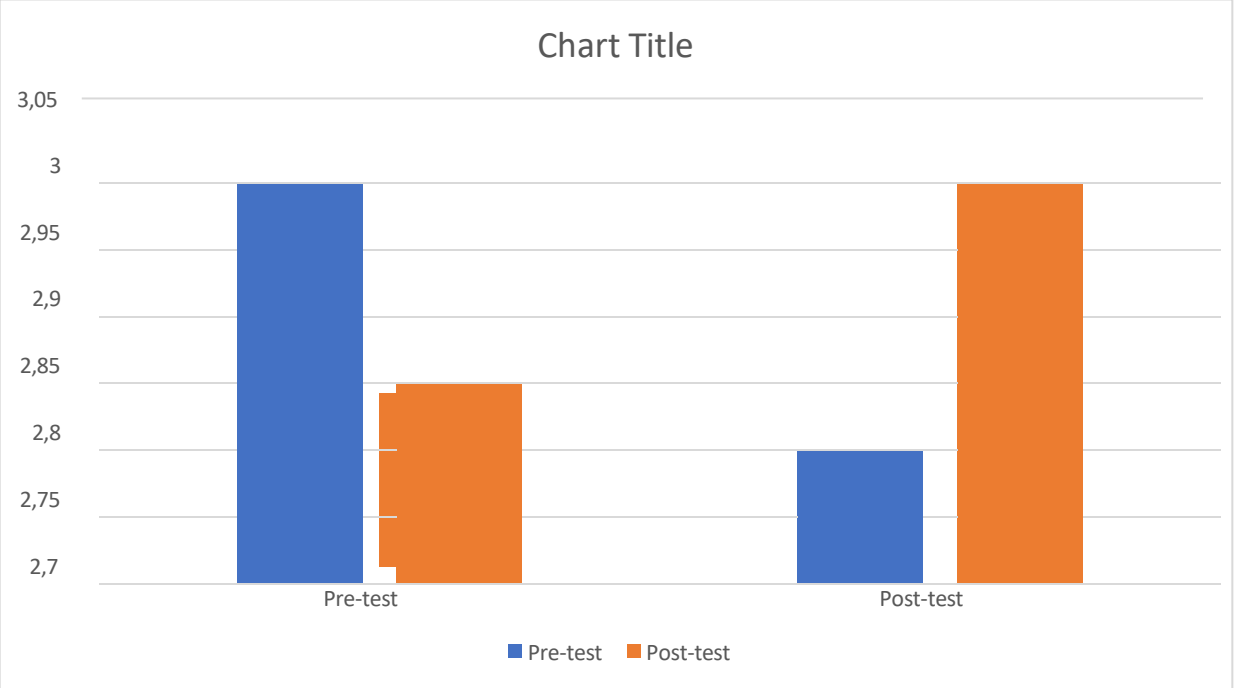
To evaluate intervention outcomes, the International Consultation on Incontinence Questionnaire- Urinary Incontinence Short Form (ICIQ-UI SF) was administered both before and after the intervention. The ICIQ-UI SF is an internationally validated instrument that is widely recognized for its reliability and validity in both clinical and research settings (Newman & Wein, 2013; Lestari et al., 2021). This tool measures multiple aspects of urinary incontinence, including severity of symptoms, frequency of urine leakage episodes, and the impact on quality of life, thus providing a comprehensive assessment of the intervention's effectiveness. Ethical approval for the study was granted by the relevant institutional review board, and all respondents signed informed consent forms. Confidentiality was carefully maintained throughout, and participants were informed of their right to withdraw from the study at any stage without consequences.

Placing this study in a broader clinical context, urinary incontinence can be classified into stress, urge, and mixed types, each with distinct pathophysiological mechanisms. The condition is influenced by several risk factors, such as aging, hormonal changes, obesity, a history of childbirth, and comorbid chronic diseases like diabetes mellitus or hypertension. Physiologically, urinary incontinence often results from weakened pelvic floor muscles, reduced bladder compliance, or impaired neurological control of the urinary system. A number of previous studies, including those by Hagen et al. (2020) and Cacciari et al. (2022), have demonstrated that pelvic floor muscle training (PFMT) can significantly improve muscle strength, reduce the frequency of urine leakage, and enhance patients' overall quality of life. However, these benefits are highly dependent on adherence to the exercise routine, the quality of supervision, the intensity of the training program, and the method of delivery. The introduction of digital platforms such as KEET represents an important innovation in geriatric health promotion, particularly in expanding access to Kegel training. Through digital delivery, older adults can receive structured educational content, guided exercise instructions, and consultation services without the need for frequent clinical visits. This model of care holds potential for increasing motivation, engagement, and adherence, especially in contexts where access to health facilities may be limited. Nevertheless, the degree to which elderly individuals can fully benefit from digital interventions depends on critical factors such as their level of digital literacy, availability of family or caregiver support, and intrinsic motivation to sustain regular practice.

By integrating structured Kegel exercise training with the flexibility of a digital platform, this study aimed to explore both the feasibility and practicality of using KEET in a real-world community setting. While the small sample size and short duration of the intervention remain important limitations, the research nonetheless provides meaningful contributions. It highlights not only the opportunities of adopting digital health interventions for managing urinary incontinence in older adults but also the challenges that must be addressed, particularly related to adherence, digital access, and long-term sustainability. These insights underscore the need for further research with larger sample sizes, longer durations, and hybrid approaches that combine digital support with direct supervision to maximize the potential benefits of KEET.

RESULTS

Variable	Description	Explanation
Pre-test	Min = 2; Max = 3	Mean 2.83; Median 3.00; SD = 0.379
Post-test	Min = 2; Max = 3	Mean 2.80; Median 3.00; SD = 0.407
Wilcoxon	p-value = 0.317	No significant difference between pre-test and post-test (p > 0.05)



Sumber: Data Primer, diolah dengan SPSS (2023)

The findings of this study indicated a slight decrease in the mean urinary incontinence score, from 2.83 at the pre-test stage to 2.80 at the post-test stage. Despite this minor reduction, the median score remained unchanged at 3.00, suggesting that overall symptom severity within the group did not shift in a meaningful way. In addition, the standard deviation showed a slight increase, reflecting greater variation in the outcomes experienced by different respondents. These results suggest that while some individuals may have shown slight improvements, others did not benefit to the same extent, thereby widening the variability of responses. Statistical analysis using the Wilcoxon signed-rank test confirmed that the difference between pre-test and post-test scores was not significant ($p = 0.317$). This finding indicates that the website-based Kegel Exercise Elderly Training (KEET) intervention, as implemented in this study, did not produce a statistically measurable improvement in urinary incontinence among the elderly participants. From a clinical standpoint, this lack of statistical significance does not necessarily negate the potential of the intervention, but rather highlights the limitations of the study design, including the relatively short intervention duration and the small sample size. A closer look at the respondents' characteristics provides further context for these findings. The majority of participants (80%) were categorized as experiencing severe urinary incontinence, while the remaining 20% fell into the moderate category. This distribution suggests that most participants began the study with a high baseline severity, which may have made it more difficult to observe measurable improvements within such a short intervention period. Demographic analysis also revealed that most respondents were aged over 70 years, predominantly female, and living with comorbid conditions such as hypertension and diabetes mellitus. These comorbidities are known to contribute to both the onset and persistence of urinary incontinence, thereby potentially influencing the effectiveness of pelvic floor muscle interventions.

Field observations during the intervention sessions also provided valuable insights beyond the statistical results. Several participants encountered difficulties in independently accessing the KEET website due to limited digital literacy and physical limitations commonly associated with advanced age. Many required the assistance of family members to navigate the platform, view instructional videos, or follow exercise instructions. This reliance on external support may have reduced the frequency and consistency with which exercises were performed outside of supervised sessions, thereby limiting the potential benefits of the program. Interestingly, although the overall statistical test results did not demonstrate significant improvements, qualitative observations suggested otherwise. A small number of participants reported a subjective reduction in urinary leakage, particularly after the third and fourth intervention sessions. These participants described feeling slightly better bladder control and fewer leakage episodes, even though the changes were not sufficient to alter the group's mean or median scores in a statistically significant way. This discrepancy between subjective reports and statistical outcomes suggests that KEET may have the potential to produce benefits if applied over a longer duration or with stronger adherence strategies. The limited effectiveness observed in this study may also be attributed to the short intervention period of only four sessions. Existing literature indicates that pelvic floor muscle training requires at least 8–12 weeks of consistent practice to produce measurable improvements in muscle strength and continence (Nguyen et al., 2024). Therefore, the current study's timeframe was likely insufficient for participants to achieve meaningful physiological adaptations. Moreover, the small sample size restricted statistical power, making it more difficult to detect subtle changes that might have occurred in subgroups of participants.

Overall, the findings highlight both the challenges and opportunities of implementing website-based KEET among elderly populations. On the one hand, the lack of significant results underscores the barriers faced by older adults, including severe baseline symptoms, comorbidities, limited digital literacy, and short intervention duration. On the other hand, the

slight symptom improvements observed in some individuals suggest that the program has potential if adequately supported. This emphasizes the importance of tailoring digital health interventions to the capacities of elderly users, incorporating family involvement, and extending the duration of training to achieve clinically meaningful outcomes.

DISCUSSION

The findings of this study indicated that the Website-Based Kegel Exercise Elderly Training (KEET) did not produce a statistically significant effect on urinary incontinence among the elderly, as reflected in the Wilcoxon test result with a p-value of 0.317. Although the mean urinary incontinence score decreased slightly from 2.83 at the pre-test to 2.80 at the post-test, the change was too small to be considered significant. This suggests that, while KEET exercises may provide potential physiological benefits through the strengthening of pelvic floor muscles, the mode of delivery via a digital platform may not yet be fully adapted to the characteristics, needs, and limitations of the elderly population. Evidence from prior studies consistently demonstrates that Kegel exercises are effective in reducing urinary incontinence symptoms, particularly when they are performed regularly and under proper guidance (Angelini, 2017; Abu Raddaha & Nasr, 2022). However, the success of these exercises is highly dependent on adherence. Among older adults, maintaining consistency is often challenging due to several barriers, including limited digital literacy, reduced motivation, dependence on family members for technical support, and age-related health issues (Jaffar et al., 2022). These barriers may have contributed to the limited improvements observed in this study, as some participants might not have been able to fully engage with the website-based program or consistently practice the exercises as recommended.

The results of this study are in line with those reported by Koerniawan et al. (2020), who also found no significant improvement in urinary incontinence outcomes when adherence levels to pelvic floor muscle training were low. In contrast, Aoki et al. (2018) and Nguyen et al. (2024) documented significant reductions in urinary symptoms when Kegel exercises were implemented over longer durations (8–12 weeks) and within structured, supervised interventions. Similarly, Begić et al. (2023) found that the addition of biofeedback devices such as KegelSmart significantly enhanced outcomes compared to Kegel exercises performed without technological support. These differences highlight that the effectiveness of pelvic floor interventions depends not only on the exercise itself but also on important contextual factors, including the method of delivery, the duration of the program, the presence of supervision, and the use of supportive technology. Another factor that may explain the absence of significant results in this study is the relatively short intervention period, which lasted for only four sessions. The literature emphasizes that Kegel exercises typically require at least 8–12 weeks of consistent practice to achieve measurable improvements in pelvic floor muscle strength and urinary control. Short-term programs may therefore be insufficient to allow for physiological adaptation. In addition, adherence within elderly populations is often hindered by dependency on others for digital access, difficulties in maintaining daily routines, and limited awareness of the importance of managing urinary incontinence. These issues can significantly reduce the consistency and accuracy with which exercises are performed. From a nursing and public health perspective, these findings highlight the need for greater involvement of family members and healthcare providers in supporting elderly individuals to maintain adherence to prescribed exercise programs. Digital platforms like KEET may serve as useful supplementary tools for health promotion, offering flexibility and accessibility, but they cannot yet replace direct, in-person interventions that provide ongoing supervision, motivation, and corrective feedback. To enhance their effectiveness, website-based programs should integrate additional features such as real-time feedback, structured monitoring, and interactive modules. Involving family members and community health workers can also

improve engagement and ensure that elderly participants receive the encouragement and technical assistance they need (Hayati et al., 2024).

Taken together, the absence of statistically significant results in this study underscores both the potential and the limitations of digital health interventions for the elderly. On one hand, KEET offers innovation, accessibility, and scalability. On the other hand, its effectiveness is constrained by factors such as program duration, user adherence, and the digital divide among older adults. Future interventions should therefore adopt a hybrid approach that combines online platforms with face-to-face supervision, incorporates supportive technologies like biofeedback, and tailors content to the digital literacy levels of participants. By addressing these factors, the potential benefits of Kegel exercises in reducing urinary incontinence among the elderly can be optimized in a more effective, inclusive, and sustainable way.

CONCLUSION

This study concluded that the implementation of Website-Based Kegel Exercise Elderly Training (KEET) did not produce a statistically significant effect on urinary incontinence outcomes among the elderly, as indicated by the Wilcoxon test ($p = 0.317$). Although there was a slight reduction in the mean score of urinary incontinence from pre-test to post-test, the difference was too small to be considered significant. These findings suggest that within the limited duration and scope of this study, the intervention was not sufficiently effective in producing measurable clinical improvements. One possible explanation is that elderly participants faced challenges in maintaining adherence to digital interventions due to limited digital literacy, reduced motivation, reliance on family members for technical assistance, and health-related constraints. Without adequate support mechanisms, these barriers may reduce both the consistency and accuracy of exercise performance, thereby limiting the intervention's outcomes.

From a broader perspective, this study highlights both the opportunities and challenges of implementing digital health interventions for older adults. On one hand, website-based programs like KEET offer flexibility, accessibility, and the potential to reach more individuals in community settings without requiring frequent clinical visits. On the other hand, the lack of direct supervision, insufficient engagement strategies, and the short intervention period, only four sessions in this study, restricted the program's ability to generate meaningful clinical changes. Despite the absence of statistically significant improvements, Kegel exercises remain clinically relevant when performed consistently over a longer period. The slight symptom improvements observed in some participants suggest that KEET has potential if delivered with stronger adherence support, longer duration, and additional supportive strategies. Future interventions should therefore integrate biofeedback technology, family engagement, and hybrid approaches that combine online and face-to-face supervision. In conclusion, while this study did not demonstrate significant improvements in urinary incontinence following KEET intervention, it contributes valuable insights into the feasibility and limitations of digital health programs for the elderly. The findings emphasize the importance of designing more comprehensive approaches that align with elderly users' capacities by incorporating structured supervision, family involvement, and tailored strategies adapted to their level of digital literacy. With longer intervention periods and supportive features such as real-time monitoring, programs like KEET have the potential to evolve into effective, sustainable tools for improving urinary incontinence management and enhancing the quality of life among older adults.

RECOMMENDATION

Future research on the implementation of Website-Based Kegel Exercise Elderly Training (KEET) should address the limitations identified in this study by involving larger sample sizes and extending the duration of interventions. A broader sample would improve the generalizability of findings, while a longer intervention period, ideally at least 8–12 weeks, would allow researchers to capture the long-term physiological adaptations of pelvic floor muscles and the behavioral changes associated with consistent practice (Nguyen et al., 2024).

In addition to expanding scale and duration, future studies are encouraged to adopt blended or hybrid approaches that combine the flexibility of digital platforms with the benefits of direct supervision and community-based support. Such strategies can enhance adherence among elderly participants by providing personalized feedback, regular monitoring, and motivational reinforcement, which are often lacking in fully digital interventions. The integration of biofeedback technology, as demonstrated by Begić et al. (2023), could further improve the effectiveness of KEET by offering real-time monitoring and guidance. To address barriers related to digital literacy, structured training on the use of smartphones, websites, and communication applications should be incorporated into future programs. This would help minimize dropout rates and ensure that participants can fully utilize the KEET platform. Support from family members, community health workers, and peer groups is also crucial to strengthen engagement and sustainability (Hayati et al., 2024; Lisdahayati et al., 2025). Additionally, culturally sensitive approaches and motivational strategies should be tailored to align with the values, preferences, and daily routines of elderly populations, thereby increasing both acceptance and effectiveness.

Healthcare professionals also play an important role in integrating technology into geriatric care. Platforms such as KEET should not replace professional supervision but rather complement existing health services by promoting health literacy, self-care practices, and preventive strategies in managing urinary incontinence. With proper guidance and tailored support, digital interventions like KEET could significantly contribute to improving the quality of life and reducing the burden of urinary incontinence among older adults. In conclusion, future research should move toward multidimensional strategies that combine digital innovation with direct human interaction, structured supervision, family involvement, and cultural adaptation. Through these efforts, KEET and similar platforms may evolve into sustainable, effective, and inclusive health promotion tools for elderly populations worldwide.

ACKNOWLEDGMENTS

The authors would like to sincerely express their deepest gratitude to all elderly participants who willingly took part in this study, as well as to their families, whose continuous encouragement and support greatly assisted the intervention process. Their commitment and cooperation were truly essential to the successful completion of this research. The authors also extend heartfelt appreciation to the Gilingan Community Health Center in Surakarta for facilitating the implementation of the study by providing access, assistance, and a supportive environment for both researchers and participants. In addition, the authors are profoundly grateful to their academic supervisors, whose invaluable guidance, constructive feedback, and consistent encouragement played a vital role throughout the entire research process from study design to data collection, analysis, and manuscript preparation. Their expertise and mentorship not only enhanced the quality of this study but also contributed significantly to the authors' academic and professional growth. Finally, the authors would like to acknowledge the contributions of all individuals, colleagues, and institutions, whether directly or indirectly, who provided advice, resources, or moral support along this journey. The successful completion of this study would not have been possible without the collective support of these various parties.

REFERENCES

Abu Raddaha, A. H., & Nasr, N. (2022). Effectiveness of pelvic floor muscle training for urinary incontinence: A systematic review. *International Urogynecology Journal, 33*(5), 1231– 1242.

Amelia, D. (2020). Faktor risiko inkontinensia urin pada lansia perempuan. *Jurnal Keperawatan Indonesia, 23*(2), 112–120.

Angelini, D. J. (2017). Urinary incontinence in women: Pelvic floor muscle training as first-line treatment. *Nursing for Women's Health, 21*(1), 33–40.

Aoki, Y., Brown, H. W., Brubaker, L., Cornu, J. N., Daly, J. O., & Cartwright, R. (2018). Urinary incontinence in women. *Nature Reviews Disease Primers, 4*(1), 37.

Begić, D., Šprem Goldštajn, M., & Jerčić, I. (2023). Comparison of Kegel exercises and a combination of Kegel exercises with the use of the KegelSmart biofeedback device in the treatment of static urinary incontinence. *Acta Clinica Croatica, 62*(1), 55–62. https://doi.org/10.20471/acc.2023.62.01.07

Cacciari, L. P., Dumoulin, C., Bø, K., & et al. (2022). Group-based pelvic floor muscle training is a more cost-effective approach to treat urinary incontinence in older women: Economic analysis of a randomised trial. *Journal of Physiotherapy, 68*(2), 102–110. https://doi.org/10.1016/j.jphys.2022.01.006

Hagen, S., Stark, D., & Glazener, C. (2020). Pelvic floor muscle training for urinary incontinence in women. *Cochrane Database of Systematic Reviews, (7)*, CD009508. https://doi.org/10.1002/14651858.CD009508.pub3.

Hayati, N. M., Rahmawati, N. A., Prasetia, A., & Ronawati, D. D. (2024). *Edukasi Latihan Kegel untuk Mencegah Inkontinensia Urin pada Wanita dengan Riwayat Persalinan Spontan*. Prosiding Seminar Nasional, 2, 419–424.

Jaffar, A., Rahman, R., & Yusuf, S. (2022). The role of mobile health applications in promoting adherence to pelvic floor muscle training. *BMC Geriatrics, 22*, 564.

Koerniawan, D., Sutanto, H., & Wijaya, R. (2020). The effect of Kegel exercise on urinary incontinence among elderly women. *Malaysian Journal of Nursing, 11*(4), 56–62.

Lestari, S., et al. (2021). *Effectiveness of Kegel exercises on reducing urination frequency among the elderly*. Indonesian Journal of Geriatric Nursing.

Lisdahayati, L., Pome, G., Zanzibar, Z., Saprianto, S., & Viona, Z. (2025). *Management of Urinary Incontinence with Kegel Gymnastics in Elderly Patients with Urine Elimination Disorders.* Lentera Perawat, 6(1), 187–196.

Mihaľová, M., Čech, P., & Ondrušová, A. (2022). *Psychosocial consequences of urinary incontinence in the elderly population.* Clinical Interventions in Aging, 17, 345–353.

Nguyen, T. et al. (2024). *The Effect of Pelvic Floor Muscle Training on Health-Related Quality of Life in Postmenopausal Women With Genitourinary Syndrome: A Systematic Review and Meta-Analysis*.

World Health Organization. (2019). *Incontinence: Health topics*. WHO.

Original Research

Web-Based Education and Team Games Tournaments Increase Knowledge, Attitude, and Beliefs towards Acute Coronary Syndrome in the Community

Achmad Saifulloh[1], Ratna Wirawati Rosyida[1*], Rendi Editya Darmawan[1]
[1]School of Nursing, Poltekkes Kemenkes Surakarta, Indonesia

ABSTRACT
Background: Cardiovascular diseases, particularly Acute Coronary Syndrome (ACS), are the leading causes of death worldwide and in Indonesia. Low public awareness in identifying the signs and symptoms of ACS leads to delayed treatment and increases the risk of fatal complications. Innovative health education based on technology and gamification is needed to improve public literacy and response toward ACS. **Objective:** This study aims to determine the effect of combining Web-Based Education and team games on the knowledge, attitudes, and beliefs of the community regarding ACS. **Methods:** A quantitative pretest-posttest design was conducted on 37 respondents. The educational intervention used web-based education and team games, followed by measurements of knowledge, attitudes, and beliefs before and after the intervention. Data were analyzed using the Wilcoxon test. **Results:** There was a significant increase in respondents' knowledge, attitudes, and beliefs about ACS after the intervention. The Wilcoxon test showed a p-value of 0.000 for knowledge and 0.001 for attitudes and beliefs, indicating that the null hypothesis was rejected and the alternative hypothesis accepted. This means that web-based education combined with team games significantly influenced the community's knowledge, attitudes, and beliefs toward ACS. **Conclusion:** Web-based education and team games effectively improve knowledge, attitudes, and beliefs about ACS among the community of the Posyandu RW 12 Jagalan under the Pucangsawit Community Health Center.

ARTICLE HISTORY
Received: September 15, 2025
Accepted: September 19, 2025

KEYWORDS
Acute Coronary Syndrome, Web-Based Education, Team Games Tournament, Knowledge, Attitudes, Beliefs

CONTACT
Ratna Wirawati Rosyida
ratna.rosyida@poltekkes-solo.ac.id
Department of nursing, Poltekkes Kemenkes Surakarta, Jln. Letjen Sutoyo, Mojosongo, Surakarta, Indonesia.

INTRODUCTION

Cardiovascular diseases (CVDs) remain the leading cause of morbidity and mortality worldwide. Acute coronary syndrome (ACS) is one of the most life-threatening conditions. According to the World Health Organization, cardiovascular diseases are the cause of over 32% of all global deaths, with ACS as a major contributor. In Indonesia, cardiovascular diseases rank third in mortality with a rate of 90.4 deaths per 100,000 population. This high incidence demands effective educational strategies to enhance public understanding of ACS signs and symptoms, enabling timely action to reduce fatal complications (World Health Organization, 2025).

Major challenge in managing ACS is the community's low awareness of its early symptoms. Only 40% of ACS patients recognize their symptoms as an emergency, while others perceive them as minor health issues, leading to delayed medical assistance and increased mortality and severe complications (Flynn et al., 2007). Therefore, innovative and effective educational strategies are essential to improve community skills in identifying ACS symptoms.

Game-based learning has gained attention in health education, with Team Games Tournament (TGT) being a widely used cooperative learning model that integrates competition and collaboration to enhance concept comprehension. TGT has been shown to boost motivation, understanding, and social interaction among participants. In health education, studies reveal that game-based approaches improve memory retention and learner engagement, including in recognizing disease symptoms (Horn, 2023).

Digital technology advancements offer opportunities to improve health literacy. Web-based education (WBE) has proven effective in delivering health information to diverse populations, with digital platforms increasing user engagement by over 70% compared to traditional methods. In the context of ACS, research by Neubeck et al. (2015) demonstrated that web-based educational applications improved community awareness of ACS symptoms by 55% post-intervention.

Although both approaches independently show effectiveness, research combining team games and web-based education for health education is limited. Most prior studies focus on the individual effectiveness of each method without exploring its synergistic potential. For instance, Bohm et al. (2023) examined digital education's impact on cardiovascular health literacy but did not address how TGT might enhance understanding when paired with digital tools.

Additionally, previous research has lacked emphasis on interactivity and participant engagement when integrating game-based and digital learning. While TGT can enhance medical concept comprehension, some participants face challenges accessing supplemental learning resources (Horn, 2023). Conversely, web-based education improves health literacy but struggles with participant engagement, especially among those less familiar with technology (Parry et al., 2020).

Based on the identified gaps, this study aims to explore the combined effect of TGT and web-based education on skills in recognizing ACS signs and symptoms. The research intends to assess whether integrating these methods produces more significant educational outcomes than their separate use. This approach has the potential to

develop a more effective learning model by merging interactivity, collaboration, and digital accessibility.

In promotive and preventive health actions such as health education, nurses play a critical role in developing personal skills, providing supportive environments, and strengthening community actions through interactivity and collaboration(Iriarte-Roteta et al., 2020). As stated by Indonesian Law No. 38 of 2014, nurses are responsible for health education, counseling, community empowerment, and advocacy. Thus, nurses hold a strategic role in implementing the integrated TGT and web-based education intervention as a health promotion and disease prevention effort.

By integrating TGT and web-based education, this study could serve as a foundation for innovative teaching methods applicable across various health education contexts. Furthermore, findings are expected to enrich learning theories and health literacy knowledge, providing empirical evidence on the effectiveness of combining educational methods to improve cardiovascular disease symptom recognition.

RW 12 Kelurahan Jagalan is one of the Pucangsawit Health center work areas, predominantly inhabited by middle-aged to elderly adults engaged mostly in trade and local businesses, and was selected as the intervention site. This demographic is vulnerable to cardiovascular health issues, with a recorded 2,695 cardiovascular cases in 2024 and 2,160 cases reported in the first half of 2025 within the Pucangsawit Health Center working area. These data underscore the urgency of addressing cardiovascular disease in this community, making RW 12 a suitable location for this educational intervention aimed at improving awareness, prevention, and control of cardiovascular diseases.

MATERIALS AND METHODS

This is a quantitative study with a pre-experimental pre-test and post-test one-group design to assess the impact of combined web-based education and TGT on recognising ACS symptoms. The design measured changes in knowledge, attitudes, and beliefs before and after the intervention without a control group.

The study was conducted at Posyandu RW 12, Kelurahan Jagalan, Surakarta, from 15–22 June and 6–13 July 2025. The population consisted of 45 Posyandu participants, from which a purposive sample of 40 was selected based on Slovin's formula with a 5% margin of error. Inclusion criteria were age ≥18 years, willingness to participate, and access to a mobile device with internet. Exclusion criteria included cognitive, hearing, or visual impairments and severe medical conditions.

Data collection utilised the ACS Response Index developed by Riegel et al. (2007), comprising subscales measuring knowledge (21 true/false items), attitudes (5 items), and beliefs (7 items) regarding ACS symptoms and response behaviours.

The intervention involved pre-test data collection via Google Forms or printed forms, followed by a seven-day period for participants to access an educational website created with Google Sites about coronary heart disease information. Subsequently,

participants engaged in a TGT to reinforce learning through group discussions and competitive exercises, with rewards for timely, accurate responses. A post-test assessed changes after the combined intervention.

Data were processed through editing, coding, tabulation, and entry. Given the sample size under 50, normality was tested using the Shapiro-Wilk test, revealing non-normal distributions ($p < 0.05$). Consequently, the Wilcoxon Signed-Rank Test was applied to analyze differences in knowledge, attitudes, and beliefs pre- and post-intervention.

RESULTS

This study involved two rounds of data collection to evaluate the use of web-based education and a team games tournament. The first session on June 15th, 2025, included a pre-test and instructions, with 43 participants attending. On June 22th 2025, 33 participants participated in a team-based activity followed by a post-test. Initially, 20 participants completed the study, while 13 dropped out. A second set of data was collected on July 6th, 2025, with 17 participants, who also attended a follow-up session on July 13th, 2025. As a result, the total number of respondents in both data collections was 37 respondents.

Table 3. 1 Respondents' Characteristic

Characteristic	n	%	P-value Knowledge	OR	P-value Attitudes	OR	P-value Beliefs	OR
Age								
Adults (21-45 years old)	22	59%	0.613	1.5	0.784	1.236	0.417	0.563
Elder Adult (46-65 years old)	15	41%						
Education								
Primary-Middle School	10	27%	0.624	1.5	0.624	0.667	0.847	0.857
Highschool-College	27	73%						
Gender								
Male	0	0%	-	-	-	-	-	-
Female	37	100%						
Comorbidities								
Dislipidemia Hipertension Diabetes Mellitus	13	35%	0.351	0.442	0.896	1.111	0.684	1.518
None	24	65%						

Smoking History								
Yes	0	0%%	-	-	-	-	-	-
No	37	100%						

Statistically, the analysis of the relationship between respondent characteristics and the variables of knowledge, attitude, and belief showed varying p-values. For age, the p-values were 0.613 for knowledge, 0.784 for attitude, and 0.417 for belief, all exceeding the alpha level of 0.05, indicating no statistically significant relationship between age and these variables. Similarly, for education, the p-values were 0.624 (knowledge), 0.624 (attitude), and 0.857 (belief), also showing no significant association. Therefore, it can be concluded that there is no statistically meaningful relationship between demographic characteristics and the levels of knowledge, attitude, and belief among respondents.

Table 3. 2 Knowledge Distribution

Pre	Post	Difference	Percentage	Interpretation
17	18	1	6%	Increased
15	16	1	7%	Increased
15	17	2	13%	Increased
16	17	1	6%	Increased
16	18	2	13%	Increased
13	16	3	23%	Increased
15	16	1	7%	Increased
14	16	2	14%	Increased
13	16	3	23%	Increased
13	14	1	8%	Increased
16	19	3	19%	Increased
13	17	4	31%	Increased
15	18	3	20%	Increased
14	17	3	21%	Increased
10	18	8	80%	Increased
18	20	2	11%	Increased
17	19	2	12%	Increased
13	18	5	38%	Increased
6	15	9	150%	Increased
6	14	8	133%	Increased
15	19	4	27%	Increased
15	17	2	13%	Increased
7	15	8	114%	Increased
16	17	1	6%	Increased
6	12	6	100%	Increased
6	14	8	133%	Increased
13	18	5	38%	Increased
9	14	5	56%	Increased
13	19	6	46%	Increased
12	15	3	25%	Increased
7	16	9	129%	Increased
12	17	5	42%	Increased
10	13	3	30%	Increased
11	15	4	36%	Increased

Pre	Post	Difference	Percentage	Interpretation
17	19	2	12%	Increased
15	17	2	13%	Increased
20	21	1	5%	Increased

The measurement results of knowledge scores before (pre-test) and after (post-test) the intervention among respondents showed an increase in knowledge scores following the intervention. Pre-test scores ranged from 6 to 20, while post-test scores improved to between 12 and 21. The difference between pre- and post-test scores varied from 1 to 9 points. The percentage increase in knowledge ranged from a minimum of 5% to a maximum of 150% for some respondents. These results demonstrate that the intervention or educational session had a positive impact on participants' knowledge, as evidenced by the increase in knowledge scores for all respondents. This aligns with findings in similar studies showing significant improvement after educational interventions.

Table 3. 3 Attitude Distribution

Pre	Post	Difference	Percentage	Interpretation
11	13	2	18%	Increased
12	13	1	8%	Increased
13	13	0	0%	Unchanged
10	13	3	30%	Increased
11	12	1	9%	Increased
11	13	2	18%	Increased
10	11	1	10%	Increased
12	13	1	8%	Increased
10	14	4	40%	Increased
13	13	0	0%	Unchanged
11	12	1	9%	Increased
12	14	2	17%	Increased
10	13	3	30%	Increased
11	13	2	18%	Increased
12	13	1	8%	Increased
12	12	0	0%	Unchanged
12	13	1	8%	Increased
12	13	1	8%	Increased
13	15	2	15%	Increased
15	15	0	0%	Unchanged
10	10	0	0%	Unchanged
12	14	2	17%	Increased
14	14	0	0%	Unchanged
6	9	3	50%	Increased
9	11	2	22%	Increased
17	17	0	0%	Unchanged
10	11	1	10%	Increased
10	11	1	10%	Increased
10	11	1	10%	Increased
8	13	5	63%	Increased
10	11	1	10%	Increased

Pre	Post	Difference	Percentage	Interpretation
19	19	0	0%	Unchanged
14	14	0	0%	Unchanged
6	9	3	50%	Increased
11	11	0	0%	Unchanged
11	12	1	9%	Increased
14	14	0	0%	Unchanged

The attitude scores before (pre-test) and after (post-test) the intervention showed changes in the majority of respondents. Most participants experienced an increase in attitude scores, indicated by positive differences between pre-test and post-test scores and described as "Increased" in the interpretation column. Pre-test scores ranged from 9 to 19 on average, while post-test scores improved for some respondents up to 21.

The difference in attitude scores mostly ranged from 1 to 5 points, with percentage increases varying from 8% to 63%. For example, some respondents showed an increase of up to 60%, such as a pre-test score of 10, improving to a post-test score of 16. However, some respondents showed no change in their attitude scores.

These data indicate that the intervention was effective in enhancing respondents' attitudes towards the material presented, although not all participants exhibited change. A small portion of respondents maintained the same attitude before and after intervention, but the majority showed a positive increase in attitude scores, demonstrating the overall success of the intervention in improving attitudes.

Table 3. 4 Belief Distribution

Pre	Post	Difference	Percentage	Interpretation
18	22	4	22%	Increased
18	20	2	11%	Increased
22	22	0	0%	Unchanged
19	22	3	16%	Increased
16	20	4	25%	Increased
17	18	1	6%	Increased
16	18	2	13%	Increased
14	21	7	50%	Increased
18	19	1	6%	Increased
24	24	0	0%	Unchanged
16	20	4	25%	Increased
20	20	0	0%	Unchanged
12	17	5	42%	Increased
17	17	0	0%	Unchanged
20	21	1	5%	Increased

Pre	Post	Difference	Percentage	Interpretation
16	19	3	19%	Increased
18	19	1	6%	Increased
24	24	0	0%	Unchanged
17	20	3	18%	Increased
20	24	4	20%	Increased
20	21	1	5%	Increased
18	20	2	11%	Increased
20	21	1	5%	Increased
18	18	0	0%	Unchanged
23	23	0	0%	Unchanged
18	20	2	11%	Increased
18	19	1	6%	Increased
18	20	2	11%	Increased
18	19	1	6%	Increased
20	20	0	0%	Unchanged
16	18	2	13%	Increased
19	21	2	11%	Increased
20	21	1	5%	Increased
17	17	0	0%	Unchanged
16	18	2	13%	Increased
21	22	1	5%	Increased
20	21	1	5%	Increased

Twenty-eight respondents showed an increase in confidence scores after the intervention. This improvement is evidenced by positive differences between pre-test and post-test scores, both in absolute terms and as percentage increases, ranging from 5% to 50%. Some respondents exhibited significant changes, such as an increase from 14 to 21 (50%) and from 12 to 17 (42%). Meanwhile, nine respondents showed no change in their scores, possibly due to initially high confidence levels, low engagement in the educational sessions, or other personal factors affecting their reception of the material. Overall, these findings indicate that the educational intervention had a positive impact on increasing respondents' confidence.

Table 3. 5 WBE and TGT effect on Knowledge, Attitudes, and Beliefs

Variable	p value
Knowledges	0,000
Attitudes	0,001
Beliefs	0,001

With p-values for knowledge, attitude, and belief variables is less than the alpha value of 0.05. Consequently, the alternative hypothesis (H1) is accepted, indicating that the web-based education combined with team games has a significant effect on improving knowledge, attitude, and belief regarding ACS.

DISCUSSION

The findings show that WBE combined with TGT is helping participants to recognize ACS symptoms and also helps participants distinguish ACS symptoms from other medical symptoms. This educational intervention enhanced knowledge and awareness, thereby supporting better decision-making during health emergencies. These results align with research by Abbasi (2024) and Mahiroh (2024), which showed that WBE improves knowledge, while TGT further reinforces it, consistent with research by Margareta & Manalu (2023) and Prasetyo et al. (.

The increase in participant attitudes can be explained through attitude formation theory by Notoatmodjo (2012), which emphasizes the role of informational stimuli in shaping individual attitudes. Interactive education acted as a stimulus, improving understanding of symptoms and appropriate responses to heart attacks. Receiving the information enabled participants to develop positive attitudes, reflected in their confidence to recognize symptoms either in themselves or others and to seek immediate help.

Upon belief change, it was analyzed using the Health Belief Model (HBM). The intervention increased participants' perceived vulnerability to ACS by making them aware of the risks if symptoms are ignored. Additionally, it enhanced understanding of the severity of ACS, leading participants to appreciate the significant physical and social consequences of delayed treatment, which motivates prompt action when symptoms appear (Abraham & Sheeran, 2014).

The Wilcoxon test results showed significant differences in respondents' knowledge, attitude, and belief before and after receiving the WBE and TGT intervention. The p-values for all three variables were consistently below the alpha threshold of 0.05, indicating a statistically meaningful effect of the intervention. Additionally, the shift in median values towards higher scores across knowledge, attitude, and belief variables further supports the positive impact of the intervention on respondents' understanding of ACS.

Prior research by O'Brien (2014) also reported significant improvements in knowledge, attitude, and belief among ACS patients following motivational interviewing-based educational interventions. Their approach, grounded in Leventhal's Self-Regulatory Model, utilized personalized and reinforced education sessions, which effectively enhanced cognitive, emotional, and social engagement, leading to sustained knowledge retention and readiness to act during ACS symptoms.

Moreover, a descriptive study conducted by Alfasfos et al. (2016) revealed positive correlations between knowledge and attitudes, beliefs, and risk perceptions

about ACS symptoms. Taken together, these results underscore the effectiveness of integrating interactive, web-based, and group learning strategies in educational interventions. Such approaches facilitate active participation, encourage discussion, and enable flexible, accessible knowledge transfer, which is critical for fostering adaptive health behaviors and timely medical response.

CONCLUSION

Respondents in this study vary from middle-aged and late adult females with various education levels. This study showed no influence of demographic characteristics on knowledge, attitudes, or beliefs about ACS. Before intervention, knowledge of typical ACS symptoms was sufficient, but awareness of atypical symptoms was low, with uncertainty and reluctance to seek medical aid. Post-intervention with combined WBE and TGT, significant improvements were observed across knowledge, attitudes, and beliefs. Statistical analysis confirmed the effectiveness of digital education and interactive team activities in enhancing ACS symptom recognition.

RECOMMENDATIONS

For future research need to use more advance website that can monitor the duration of visits and users accessing the site in real time.

ACKNOWLEDGEMENT

The authors would like to thank all participants for their participation in this research.

REFERENCES

Abbasi, N., Jebraeily, M., Gheibi, S., & Mohammadpoor, Y. (2024). Designing and evaluating a web-based training program for medical record documentation: Insights from a developing country experience. *Informatics in Medicine Unlocked*, *51*, 101599. https://doi.org/10.1016/j.imu.2024.101599

Abraham, C., & Sheeran, P. (2014). The health belief model. *Cambridge Handbook of Psychology, Health and Medicine, Second Edition*, *June 2015*, 97–102. https://doi.org/10.1017/CBO9780511543579.022

Alfasfos, N., Darawad, M. W., Nofal, B., Samarkandi, O. A., & Abdulqader, B. (2016). Knowledge, Attitudes, Beliefs and Perceived Risk of Acute Coronary Syndrome among Jordanian Patients. *Health*, *08*(15), 1830–1844. https://doi.org/10.4236/health.2016.815175

Bohm, P., Meyer, T., Narayanan, K., Schindler, M., Weizman, O., Beganton, F., Schmied, C., Bougouin, W., Barra, S., Dumas, F., Varenne, O., Cariou, A., Karam, N., Jouven, X., & Marijon, E. (2023). Sports-related sudden cardiac arrest

in young adults. *EP Europace*, *25*(2), 627–633. https://doi.org/10.1093/europace/euac172

Flynn, F. M., Cafarelli, M., Petrakos, K., & Christophersen, P. (2007). Improving Outcomes for Acute Coronary Syndrome Patients in the Hospital Setting. *Journal of Cardiovascular Nursing*, *22*(3), 166–176. https://doi.org/10.1097/01.JCN.0000267824.27449.65

Horn, M. A. (2023). Design and evaluation of a new consolidation exercise for students studying cardiac physiology: a digital escape room. *Advances in Physiology Education*, *47*(1), 82–92. https://doi.org/10.1152/advan.00176.2022

Iriarte-Roteta, A., Lopez-Dicastillo, O., Mujika, A., Ruiz-Zaldibar, C., Hernantes, N., Bermejo-Martins, E., & Pumar-Méndez, M. J. (2020). Nurses' role in health promotion and prevention: A critical interpretive synthesis. In *Journal of Clinical Nursing* (Vol. 29, Issues 21–22). https://doi.org/10.1111/jocn.15441

Mahiroh, F. F., Suryanti, & Azizah, U. (2024). Website-Based Learning Media to Improve Elementary School Students' Reproductive Health Literacy. *International Journal of Elementary Education*, *8*(1), 167–177. https://doi.org/10.23887/ijee.v8i1.63786

Margareta, E., & Manalu, S. I. Y. (2023). Pengaruh Model Pembelajaran Team Games Tournament (Tgt) Terhadap Hasil Belajar Ips Siswa Kelas VII SMP Negeri 1 Lawe Sigala-Gala. *Jurnal Pendidikan Ekonomi Dan Entrpreneurship*, *1*(3), 24–33. https://ejournal.uhn.ac.id/index.php/entrepreneurship

Neubeck, L., Lowres, N., Benjamin, E. J., Freedman, S. Ben, Coorey, G., & Redfern, J. (2015). The mobile revolution—using smartphone apps to prevent cardiovascular disease. *Nature Reviews Cardiology*, *12*(6), 350–360. https://doi.org/10.1038/nrcardio.2015.34

Notoatmodjo, S. (2012). Promosi Kesehatan & Ilmu Perilaku. In *Jakarta: Rineka Cipta*.

O'Brien, F., McKee, G., Mooney, M., O'Donnell, S., & Moser, D. (2014). Improving knowledge, attitudes and beliefs about acute coronary syndrome through an individualized educational intervention: A randomized controlled trial. *Patient Education and Counseling*, *96*(2), 179–187. https://doi.org/10.1016/j.pec.2014.05.022

Parry, M., Dhukai, A., Clarke, H., Bjørnnes, A. K., Cafazzo, J. A., Cooper, L., Harvey, P., Katz, J., Lalloo, C., Leegaard, M., Légaré, F., Lovas, M., McFetridge-Durdle, J., McGillion, M., Norris, C., Parente, L., Patterson, R., Pilote, L., Pink, L., … DeBonis, V. S. (2020). Development and usability testing of HEARTPA♀N: protocol for a mixed methods strategy to develop an integrated smartphone and web-based intervention for women with cardiac pain. *BMJ Open*, *10*(3), e033092. https://doi.org/10.1136/bmjopen-2019-033092

Prasetyo, S. I., Wulanningrum, D. N., & Kanita, M. W. (2023). *Pertolongan Pertama Luka Ringan Dengan Metode Teams Games Tournament (TGT)*. *1*(1), 43–47.

World Health Organitation. (2025). *WHO Mortality Database*. https://www.who.int/data/data-collection-tools/who-mortality-database

Original Research

The Experience of PSC (Public Safety Center) SIAGA BRO 119 When Helping Traffic Accident Victims

Bayu Akbar khayudin[1], Mei Fitria K[2],

[1] Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia
[2] Department of Nursing Poltekkes Kemenkes Semarang, Indonesia

ABSTRACT

Background: *Prehospital care is a service provided by ambulance nurses outside the hospital in emergency situations, both trauma and non-trauma. The aim is to explore the experiences of the PSC (Public Safety Center) in handling accident victims*

Methods: *The research design used a qualitative, interpretive phenomenological approach. The researcher employed a purposive sampling method; data collection in this study was conducted using an in-depth interview approach with a semi-structured interview guide involving four participants.*

Results: *The results of this study obtained 3 themes: 1) Help immediately to save lives and prevent disability of victims, 2) Providing first aid accordingly SOP First aid, 3) feel the need for community participation to contact the health team if there are traffic accident victims.*

Conclusion: *PSC 119 hopes that the community has the will and ability to help accident victims properly so that the team can help save lives and prevent disability of victims quickly and accurately*

ARTICLE HISTORY
Received: September 15, 2025
Accepted: September 19, 2025

KEYWORDS
Experience, PSC, Traffic Accident Victims; Helping

CONTACT
Bayu akbar khayudin
bayuakbarbojonegoro@gmail.com
Department if nursing, Poltekkes Kemenkes Surakarta, Jln. Letjen Sutoyo, Mojosongo, Surakarta, Indonesia.

INTRODUCTION

Emergency events can occur anytime and anywhere and require immediate treatment, as they can be life-threatening or cause permanent disability. Emergency events can be caused by, among other things, traffic accidents, illness, fire, or natural disasters (Byrne, et al., 2019). Emergency Medical Services (EMS) is established as a comprehensive out-of-hospital service system that provides effective personnel, facilities, and equipment, coordination, and transportation of patients experiencing sudden, life-threatening illnesses or injuries, provided within the specified time. EMS provides emergency services with attention to accuracy and speed in handling (Maguire,, Meara, , O'Neill, , & Brightwell, 2018). The World Health Organization (WHO) considers EMS to be an integral part of healthcare services, providing the first point of contact for healthcare workers with patients in emergencies and life-threatening injuries. In the United States, EMS workers must complete four training programs: first responder, EMT-basic, EMT-intermediate, and EMT-paramedic. After completing these trainings, they are called Emergency Medical Responders (EMR), Emergency Medical Technicians (EMT), Advanced Emergency Medical Technicians (AEMT), and Paramedics (Moore,, Shah, Owusu-Ansah, Gross,, & Flores , 2020).

Traffic accidents are the third most common cause of death in Indonesia. Globally, 1.25 million people die from traffic accidents each year, with the number of fatalities remaining unchanged since 2007 (WHO, 2015). Limitations in EMS services will result in less than optimal treatment. Delays in EMS treatment can lead to secondary injuries in traffic accident victims. Early treatment can prevent complications and death in traffic accident victims (Mehmood, Rowther, Kobusingye, & Hyder, 2018). Every EMS officer has received prior training to improve EMS services, so they are expected to be able to handle emergencies such as traffic accident victims. Nurses must provide appropriate and uninterrupted care to traffic accident victims, as well as handle them quickly. Interruptions in the care of traffic accident victims can lead to doubts in the assessment of the patient's clinical status. The time required for treatment can affect the incidence of death in traffic accident victims (Lawn, et al., 2020). EMS nurses also state that in treating victims with trauma, treatment must be focused on what will cause death first in the victim to increase the victim's safety (Yusvirazi, Ramlan, & Hou, 2019). Traffic accident victims must be treated immediately, considering the golden hour for traffic accident victims resulting in trauma is a maximum of 60 minutes after the incident. (Brice, et al., 2022). This study aims to delve deeper into the experiences of officers and the challenges they face in handling traffic accident victims. It is hoped that the research findings will support the development of traffic accident victim management.

MATERIALS AND METHODS

The research method used in this study was a qualitative one with a phenomenological approach. Four participants participated in the study. Data collection was conducted through in-depth interviews using a semi-structured interview guide (Afiyanti, Y., and Rachmawati, N.I. 2014). During the interviews, the researchers also used field notes. After data collection, the researchers used Interpretative Phenomenological Analysis (IPA) data analysis (Jeong, H., and Othman, J., 2016). The research location was the PSC 119 Siaga Bro office in Bojonegoro.

RESULTS & DISCUSSION

Table 1. Participant characteristics

Participant	Gender	Education	Length Of Working
P1	Male	Bachelor	4 Years
P2	Male	Bachelor	4 Years
P3	Male	Bachelor	4 Years
P4	Male	Bachelor	3 Years

Table 2. Matrix Theme

No	Themes	Sub themes
1	Help immediately to save lives and prevent disability of victims	Prioritize helping victims in the right way
		Understand that accident victims need immediate assistance (golden time)
		First aid aims to free the victim from disability and save their life.
2	**Performing first aid according to SOP First Aid**	Realizing how to assist traffic accident victims with SOP

		There are operational standards as a reference for first aid
3	**feel the need for community participation to contact the health team if there are traffic accident victims**	Increasing the number of helpers is very important.
		Hoping for a community that is capable and understands PSC 119
		the public must be aware of the existence of PSC 119

Thema 1: *Help immediately to save lives and prevent disability of victims,*
Explain participants' understanding of first aid knowledge for accident victims.
"*The first aid that must be done is to check for any disturbances in AB and C. This is important for rescue " P1*
"We must understand and implement the golden time when providing first aid; we must not waste time on it." P2
"An example of first aid priority is when there is an accident and the victim is unconscious, and there is a snoring sound... automatically, there is an airway obstruction we have to free it," P3
"*We must prevent disability as a helper in accordance with the objectives of first aid*," P4
First aiders must understand rescue priorities. According to field triage, the primary goal is to identify the most trauma victims at risk of life-threatening injuries (Ihsan, Airlangga, & Djuari, 2021). Furthermore, the basic principle of first aid is to preserve the victim's life, prevent the victim's condition from worsening, and prevent untoward death. This action aims to provide first aid when the victim experiences an accident or illness before reaching medical personnel. Other goals of first aid include saving lives by preventing death, preventing disability or preventing disability, providing comfort to the victim, and reducing pain and anxiety. First aid requires skill and composure, as well as a calm approach, so that the victim can be helped. This is especially useful for laypeople, people working anywhere, and especially when faced with sudden illnesses or accidents that occur suddenly in front of us (Khayudin, Hariastuti , & Wicaksana, 2022)

Theme 2: Performing first aid according to SOP First Aid
This second theme describes the actions of the PSC when providing first aid to traffic accident victims. The PSC assists in accordance with established standard operating procedures**.**
" The action taken depends on the case, sir... for example, the most common is a broken bone, so our team has prepared materials and tools for splinting. We splint according to standard operating procedures, passing through 2 joints, and after completion, we evacuate with a scope to the ambulance, according to standard operating procedures.**"** P1
"*The trauma cases that we often help with, whether open or closed fractures with decreased consciousness, what I do is apply a splint with oxygen mask stabilization at 7 lpm, as well as installing a neck collar for suspected cervical trauma cases...with standard first aid."* P2
"*Can CKR with low consciousness give oxygen, cervical control, and stop bleeding if there is any with deep gauze...complete equipment and materials in our ambulance?*" P3

"*The first aid SOP already exists, sir... so we just need to develop it according to the case, whether it's CKR, CKB, cardiac arrest, or others*." P4

Emergency Medical Services (EMS) refers to the treatment and transportation of individuals in potentially life-threatening emergencies. EMS care is provided to individuals in a variety of situations, from accidents to heart attacks. EMS should be available in areas with a high risk of accidents or health risks (Horwitz, et al., 2021). EMS is an emergency response service system that provides on-site medical treatment and transportation to the nearest healthcare facility. The primary goal of EMS is to provide emergency care to patients in need of immediate treatment and transport them to the appropriate healthcare facility **(**Gawlowski & Biskup, 2019).
EMS and ambulance services exist to provide first aid and emergency care to patients in need outside of hospitals, aiming to prevent further injury and ensure a speedy recovery. Prompt treatment of traffic accident victims can reduce mortality. A reduction of even ten minutes in treatment time can further increase the mortality rate for accident victims (Da Silva, et al., 2020). According to Guan et al (2022), EMS actions refer to several things: early detection, early reporting, early response, good on-scene care, care in transit, and transfer to definitive care. Early detection can be defined as a healthcare professional or community identifying a problem or emergency that has occurred. Early reporting, by identifying the emergency by the first person on the scene, immediately requests EMS. The speed and accuracy of notification to EMS contribute to reducing the time spent treating traffic accident victims (Guan, Lee, Begg, Crombie, & Mnatzaganian, 2022).

Theme 3: feel the need for community participation to contact the health team if there are traffic accident victims

The next hope is to collaborate with the community to ensure the safety of accident victims. According to participants, the community always contacts the police when a traffic accident occurs. The reason they always contact the police is that they don't know how to contact health workers.
"*This is also the case, sir... the public doesn't know how to contact our officers... that's why they usually call the police first, then the police call us...* " (P1)
"... That's also true, sir... we hope the public knows about our presence... I don't think a phone number app is enough, so they know how to contact PSC (P4)
"The public is the first person to contact us... so we will continue to educate them so they can contact us if there's an accident..." (P2)
*"The public's important role in the first aid process is to contact us...(*P3)

O'connor, P., et al. (2021) stated that prehospital care services are influenced by a complex system with varying conditions in each country. These systems include communication, healthcare worker education, equipment response configuration, human resources, and urbanization (O'connor, O'malley, Lambe, Byrne, & Lydon, 2021). Another crucial aspect of prehospital care is the golden time. Researchers observed that patients who survived emergencies had a greater chance of survival than those who arrived at the hospital late (Putra, Masfuri , & Massie, 2019**).** Prehospital emergency services in Indonesia were actually established in the 1990s with the 118 Emergency Ambulance Service. This service is available in major cities such as Jakarta, Medan, Makassar, Yogyakarta, Palembang, and Surabaya. However, this prehospital emergency service is not widely known by the public (Nugroho, Asih, & Widyaatmadja, 2022). This

contrasts sharply with the situation in European and American countries, where emergency services are handled by a specialized unit called the Emergency Management Service (EMS). EMS is responsible for providing first aid and evacuation to health care facilities to prevent death, reduce pain, and reduce disability. These countries also maintain a dedicated call center for emergencies to request an ambulance (Boutilier & Chan, 2020). Public knowledge of how to contact health workers is crucial. When the public knows how to contact health workers, accident victims have a greater chance of improving their condition and even reducing the death rate. A good communication system needs to be established to facilitate the public's contact with an ambulance. Therefore, cooperation between the police, health workers, and the community is crucial for the safety of accident victims.

CONCLUSION

PSC 119 hopes that the community has the will and ability to help accident victims properly, so that the team can help save lives and prevent disability of victims quickly and accurately

.

ACKNOWLEDGEMENT

The author expresses his deepest gratitude to all parties who provided support, assistance, and contributions to the implementation of this research. In particular, he would like to thank the Bojonegoro PSC 119 Team for providing extraordinary opportunities, support, and cooperation throughout the research process. The entire team's contributions and dedication in providing data, information, and field access significantly contributed to the smooth running of this research. All participants who took the time and provided valuable information ensured the completion of this research.

REFERENCES

Afiyanti, Y. dan Rachmawati, N.I. 2014. Metodologi Penelitian Kualitatif Dalam Riset Keperawatan, Edisi 1. Rajawali Pers, Jakarta

Boutilier, J. J., & Chan, T. C. (2020). Ambulance emergency response optimization in developing countries. *Operations Research*, 1315-1334.

Brice, S. N., Boutilier, J. J., Gartner, D., Harper, P., Knight, V., Lloyd, J., & Tuson, M. (2022). Emergency services utilization in Jakarta (Indonesia): a cross-sectional study of patients attending hospital emergency departments. *BMC Health Services Research*, 639.

Byrne, J., Mann, N., Dai, M., Mason, S. A., Karanicolas, P., Rizol, S., & Nathens, A. B. (2019). Association between emergency medical service response time and motor vehicle crash mortality in the United States. *JAMA Surgery*, 286-293.

Da Silva, F. M., de Matos, M. H., Barbosa, D. N., Soares, D. R., de Aquino Oliveira, E. T., & Rodrigues, J. A. (2020). Golden time: Analysis of the response time of the Mobile Urgency Care Service (Samu). *Revista de Epidemiologia e Controle de Infecção*, 270-275.

Gawlowski, P., & Biskup, A. (2019). Victim evacuation techniques in emergency conditions. *Disaster and Emergency Medicine Journal*, 116-123.

Guan, G., Lee, C. M., Begg, S., Crombie, A., & Mnatzaganian, G. (2022). The use of early warning system scores in prehospital and emergency department settings to predict clinical deterioration: A systematic review and meta-analysis. *PLoS One*.

Horwitz, A. G., Grupp-Phelan, J., Brent, D., Barney, B., Casper, T. P., & Berona, J. (2021). Risk and protective factors for suicide among sexual minority youth seeking emergency medical services. *Journal of Affective Disorders*, 274-281.

Ihsan, M., Airlangga, P., & Djuari, L. (2021). Effect of employee labor expenses on the response time in the Emergency Department of Sampang Hospital, Indonesia. *Majalah Biomorfologi*, 57.

Khayudin, B. A., Hariastuti , F., & Wicaksana, D. P. (2022). *Pertolongan Pertama Kondisi Kegawatdaruratan Prehospital.* Bogor: Guepedia.

Lawn, S., Roberts, L., Willis, E., Couzner, L., Mohammadi, L., & Goble, E. (2020). The effects of emergency medical service work on the psychological, physical, and social well-being of ambulance personnel: a systematic review of qualitative research. *BMC Psychiatry*, 348.

Maguire, B. J., Meara, P., O'Neill, B. J., & Brightwell, R. (2018). Violence against emergency medical services personnel: A systematic review of the literature. *American journal of industrial medicine*, 167-180.

Mehmood, A., Rowther, A., Kobusingye, O., & Hyder, A. (2018). Assessment of pre-hospital emergency medical services in low-income settings using a health systems approach. *International journal of emergency medicine*, 53.

Moore, B., Shah, M. I., Owusu-Ansah, S., Gross, & Flores, G. (2020). Pediatric readiness in emergency medical services systems. *Pediatric*, 145.

Nugroho, K. D., Asih, S. H., & Widyaatmadja, S. T. (2022). Phenomenological Study: Overview of Palliative Management in The Pre-Hospital Area of Semarang City: Bahasa Indonesia. *Jurnal Keperawatan Malang*, 79-189.

O'connor, P., O'malley, R., Lambe, K., Byrne, D., & Lydon, S. (2021). How safe is prehospital care? A systematic review. *International journal for quality in health care*, 138.

Putra, K. A., Masfuri, M., & Massie, J. G. (2019). Peran Perawat Ambulans dalam Pelayanan Pre Hospital di Indonesia: Kajian Literatur. *urnal Penelitian Kesehatan" SUARA FORIKES"(Journal of Health Research" Forikes Voice"*, 310-316.

Yusvirazi, L., Ramlan, A. W., & Hou, P. C. (2019). State of emergency medicine in Indonesia. *Emergency Medicine Australasia*, 820-826.

Original Research/Systematic Review

The Effect Of Butterfly Hug Therapy On Anxiety Levels Of New Nursing Students

Suyanto[1], Dwi Ariani Sulistyowati [2]

[1,2] Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia

ABSTRACT

Background: New students often face challenges such as adapting to the campus environment, managing time and study load, building networks and communities, and finding friends, mentors, and a supportive community to help them succeed. Consequently, they often experience anxiety. Therefore, if anxiety is not addressed promptly, it will negatively impact, necessitating appropriate education and interventions. One such intervention is the Butterfly Hug method. **Objective:** This study aims to determine the effect of the Butterfly Hug method on reducing anxiety levels in new students in the Nursing Department of the Surakarta Health Polytechnic.

Research Method: This study used a quasi-experimental design. The sampling technique used was total sampling, resulting in 141 respondents. The instrument used was the Spence Children's Anxiety Scales (CAS).

Results: Treatment to reduce anxiety included the use of techniques. The Butterfly Hug method was administered as a self-healing technique to calm the mind using suggestions that provide comfort and calm. Data analysis using the Chi-Square Test in the experimental group showed a p-value of 0.000.

Conclusion: The butterfly hug method significantly reduced anxiety levels in new students in the Nursing Department of the Surakarta Health Polytechnic.

ARTICLE HISTORY
Received: September 15, 2025
Accepted: September 19, 2025

KEYWORDS
Butterfly Hug Method, Anxiety, New Students

CONTACT
Suyanto
Suyanto.mkes@gmail.com
Department of Nursing Poltekkes Kemenkes Surakarta, Jln. Letjen Sutoyo, Mojosongo, Surakarta, Indonesia.

INTRODUCTION

A new student is a student in their first year of college. Entering college represents a major change in one's life (Santrock, 2006; Greenberg, 1999). Individuals typically experience numerous changes during their first year of college. This is related to adjustment, a significant challenge individuals must face upon entering college (Dyson & Renk, 2006). Adjustment is necessary due to the changes in an individual's life. The following describes the changes that occur in first-year students.

Generally, individuals enter college at the age of 18.

According to Levinson (in Turner & Helms, 1995), the ages of 17-22 represent the first stage of young adulthood, marked by the transition from adolescence (pre-adulthood) to adulthood. This age also marks the beginning of college, a crucial pathway to adulthood (Montgomery & Cote in Papalia, Feldman, & Olds, 2007). This condition brings a person to two transitions that must be carried out at one time, namely from adolescence to adulthood and from a senior in high school to a new student in college.

According to the World Health Organization (WHO, 2017), the prevalence of anxiety in the global population in 2015 was 3.6%, with a total of 264 million individuals living with anxiety, a 14.9% increase from 2005 (Khoirunnisa & Dian Kurniati, 2022). According to the 2018 Basic Health Research (Riskesdas), the number of anxiety disorders in Indonesia increased from 6% in 2013 to 9.8% in 2018, with depression and anxiety predominating among adolescents. The prevalence of anxiety disorders in Central Java among adolescents was recorded at 7.71%.

Treatment to reduce anxiety includes self-healing techniques that can control emotions and anger. The Butterfly Hug method is offered as a self-healing method to calm the mind by using suggestions that provide comfort and calm (Suara & Retnaningsih, 2023).

The Butterfly Hug is a relaxation technique involving hugging oneself crosswise and placing one's hands on one's shoulders or chest while patting to relieve anxiety and calm oneself immediately (Kadri & Ridfah, 2023).

Based on a preliminary study in the Nursing Department at the Surakarta Health Polytechnic, almost all students experience anxiety due to adjustment issues and academic pressure.

MATERIALS AND METHODS

This research used in this study was a quasi-experimental study with a pre-post study without a control group design, which was conducted from August to September 2025, and the research location was at the Nursing Department of the Surakarta Health Polytechnic. The population in this study was 141 new students of the Applied Nursing Bachelor's Program at the Surakarta Health Polytechnic, and the entire population was used as a research sample.

In the data collection stages, the researcher conducted an anxiety measurement (pre-test) on the respondents before the intervention for approximately 15 minutes. The researcher was assisted by an enumerator who had previously been briefed by the researcher to ensure a shared understanding. After the pre-test implementation, is carried out starting from August 15 to September 3, 2025, the researcher began the butterfly hug method intervention with the respondents.

The intervention was administered three times over two weeks, with each session lasting approximately 10 minutes. After the intervention was completed, the researcher conducted a post-test to measure the respondents' anxiety levels using a questionnaire. Furthermore, the data was collected, data processing and analysis were carried out used Chi-Square. The research ethical feasibility permit was obtained from the Health Research Ethics Commission of Moewardi Hospital Surakarta on April 20, 2025, Number: 759/IV/HREC/2025.

RESULTS

The results of the study, which included 141 respondents, revealed characteristics of each respondent, including age, gender, and anxiety level. The results are presented in the table below.

Table 1. Frequency Distribution of Respondents' Anxiety Levels (n = 141)

Karakteristik	Frekuensi	%	Anxiety Level Mean
Age (Year)			
17	3	0,02 %	0,75
18	122	0,86 %	30.5
19	15	0,11 %	3.75
20	1	0,01 %	0.25
Gender			
Male	16	0,113%	8
Female	125	0,887%	62.5

The results of the study indicate that respondents aged 17-20 years had the highest average anxiety level at age 18 (86%). Respondents were both male and female, with the average anxiety level being higher in females (88%).

The following is the anxiety level experienced by new students before receiving Butterfly Hug therapy, as shown in Table 2.

Table 2. Respondents' Anxiety Levels before Butterfly Hug Therapy

	Frequency	Percent	Valid Percent	Cumulative Percent
Mild anxiety	3	2,1	2,1	2,1
Moderate anxiety	32	22,7	22,7	24,8
Very worried	106	75,2	75,2	100,0
Total	141	100,0	100,0	

The anxiety levels of respondents before receiving treatment in the experimental group were within the anxiety level range, with the largest proportion at the Severe Anxiety level (75.2%).

The post-test results of respondents in the experimental group (n = 141) showed that their anxiety levels after treatment are presented in Table 3.

Table 3. Respondents' Anxiety Levels after Butterfly Hug Therapy

	Frequency	Percent	Valid Percent	Cumulative Percent
Mild anxiety	6	4,3	3,3	4,3
Moderate anxiety	31	22,0	22,0	26,2
Very worried	104	73,8	73,8	100
Total	141	100	100	

The anxiety levels of respondents after treatment in the experimental group were within the anxiety range, with the largest proportion at the severe anxiety level (73.8%).

To determine the effect of butterfly hug on anxiety levels in this study, a paired-sample t-test was conducted. This test was conducted to determine differences in anxiety levels before and after the butterfly hug combination therapy treatment using the Chi Square test. The results of this test can be seen in Table 4.4 below.

Table 4. Test of differences in anxiety levels before and after butterfly therapy

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	69,480[a]	4	,000
Likelihood Ratio	22,350	4	,000
N of Valid Cases	141		

The results of the difference test show that the p value is 0.000, which means there is a significant difference in the level of anxiety of new students before and after being given butterfly hug therapy.

DISCUSSION

Before receiving the Butterfly Hug method, respondents' anxiety levels ranged from mild to severe. The highest level of anxiety was severe (73.8%). The high level of anxiety experienced by respondents is due to their being late adolescents and young adults, who are starting college life. According to Fadilah et al. (2023), the most common anxiety experienced by new students is due to adjustment to a new environment, adapting to a new campus environment, academic pressure, namely expectations for good academic performance, lack of experience in managing time and assignments, social changes, adapting to new friends, and self-expectations from others.

After receiving the Butterfly Hug method, many respondents experienced a decrease in anxiety levels, although not significantly.

These results align with research by Astuti (2024), which found that anxiety levels in late adolescents and young adults changed after receiving the Butterfly Hug method. Respondents who had experienced mild to severe anxiety levels decreased to mild and moderate levels. Research conducted by Girianto et al. (2021) demonstrated a decrease in anxiety in respondents after being given the Butterfly Hug method. According to Pristianto et al. (2022), the Butterfly Hug method can help someone feel calmer by providing self-suggestions or suggestions to help them feel better.

Before and after treatment with the Butterfly Hug method, respondents found a significant reduction in anxiety levels. The analysis of this study found an effect of the Butterfly Hug method on anxiety reduction with a p-value of 0.000 (<0.05).

These results align with research conducted by Simanjuntak et al. (2024), which demonstrated the effect of the Butterfly Hug method on anxiety reduction. Research conducted by Lazzaroni et al. (2021) demonstrated that the Butterfly Hug method has a positive effect in helping to reduce anxiety levels and alleviate traumatic symptoms.

The Butterfly Hug method can reduce anxiety levels by influencing the amygdala, which contains catecholamines, through two chemical reactions: adrenaline and noradrenaline.

The Butterfly Hug method helps provide a relaxing effect on the body because it focuses on the application of positive affirmation techniques. Individuals focus on the

affirmations created to increase their positive outlook. This improves brain functions such as the medial prefrontal cortex and posterior cingulate cortex, ventral striatum, and ventral medial prefrontal cortex, which act as parts of the brain for viewing, perception, and emotional regulation (Astuti et al., 2024).

CONCLUSION

Respondents were aged 17-20 years with an average level of severe anxiety. Before treatment, respondents' anxiety levels ranged from mild to severe. The largest proportion was at the severe level. After treatment, there was a significant decrease in anxiety levels ranging from mild to severe.

The largest proportion at the severe level was only slightly less significant. Respondents are expected to utilize the butterfly hug method as an adaptive coping strategy for dealing with anxiety. It is expected that the butterfly hug method can be implemented independently, as it is an anxiety intervention.

ACKNOWLEDGEMENT

Thanks are expressed to the leadership of the Surakarta Health Polytechnic for allowing researchers to carry out this research. Especially to the Head of the Applied Nursing Bachelor's Program at the Surakarta Health Polytechnic.

REFERENCES

Adriyansyah, M., & Rahayu, D. (2018). The influence of hug therapy on children's emotional intelligence improvement. *Advances in Social Science, Education and Humanities Research, 173*(Icei 2017), 234–237. https://doi.org/10.2991/icei-17.2018.61

Akmalia, R., & Ulfah, S. (2021). Kecemasan siswa SMP berdasarkan gender di masa pandemi covid-19. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *5*(3), 2285–2293. https://doi.org/10.31004/cendekia.v5i3.846

Ali, S. A.-Z., & Loona, M. I. (2019). Effectiveness of tapping therapy for the treatment of anxiety among university students. *Pakistan Journal of Physiology*, *15*(2), 80–83.

Annisa, D. F., & Ifdil, I. (2016). Konsep kecemasan (anxiety) pada lanjut usia (lansia). *Konselor*, *5*(2), 93. https://doi.org/10.24036/02016526480-0-00

Arviani, H., Subardja, N. C., & Perdana, J. C. (2021). Mental Healing in Korean drama "It's okay not to be okay." *Josar*, *7*(1). https://ejournal.unisbablitar.ac.id/index.php/josar/article/view/1532/1026

Asril, C. M., Suburan, M. H., Renaldy, R. (2021). Dampak Covid-19 pada pembelajaran daring terhadap motivasi belajar siswa SMPN 1 Anggeraja. *Pengalihan meto*. *X*, 312–319.

Audhia, V., Mulia, M., & Damayanti, D. (2021). Gambaran teknik hipnosis lima jari dalam mengatasi kecemasan pada pasien hipertensi. *Jurnal Ilmu Kesehatan Indonesia, 2*(1)11–15. http://jurnal.umitra.ac.id/index.php/JIKSI/article/view/538

Awalia, S., Nisa, K., & Hendriani, W. wiwit widya. (2018). Sekolah Menengah Atas Berasrama. In *Direktorat Jenderal Pendidikan Dasar dan Menengah*. https://psma.kemdikbud.go.id/index/lib/files/buku/Asrama RPH.pdf

Azizah, L. M., Zainuri, I., & Akbar, A. (2016). *Buku Ajar Keperawatan Kesehatan Jiwa*. Sidoarjo: Indomedia Pustaka.

Charles, A. (2012). Penerapan stabilisasi psikologis dengan teknik resource development and installation (RDI) pada anak dengan trauma pada masa perkembangan.

Chrisnawati, (2021). Aplikasi pengukuran tingkat kecemasan berdasarkan skala hars berbasis android. *Jurnal Teknik Komputer AMIK BSI*, *5*(2), 277–282. http://ejournal.bsi.ac.id/ejurnal/index.php/jtk

Dani, J. A., & Mediantara, Y. (2020). Covid-19 dan perubahan komunikasi sosial. *Persepsi: Communication Journal*, *3*(1), 94–102. https://doi.org/10.30596/persepsi.v3i1.4510

Dashraath, P., Wong, J. L. J., Lim, M. X. K., Lim, L. M., Li, S., Biswas, A., et al. (2020). Coronavirus disease 2019 (covid-19) pandemic and pregnancy. *American Journal of Obstetrics and Gynecology*, *222*(6), 521–531. https://doi.org/10.1016/j.ajog.2020.03.021

Erlin, F., Putra, I. D., & Hendra, D. (2020). Peningkatan pengetahuan siswa dalam pencegahan penularan covid-19. *JMM (Jurnal Masyarakat Mandiri)*, *4*(4), 7–9. http://journal.ummat.ac.id/index.php/jmm/article/view/2652

Fahrianti, F., & Nurmina. (2021). Perbedaan kecemasan mahasiswa baru ditinjau dari jenis kelamin pada masa pandemi covid-19. *Jurnal Pendidikan Tambusai*, *5*(1), 1297–1302. https://jptam.org/index.php/jptam/article/view/1101/984

Fasoro, A. A., Oluwadare, T., Ojo, T. F., & Oni, I. O. (2019). Perceived stress and stressors among first-year undergraduate students at a private medical school in Nigeria. *Journal of Taibah University Medical Sciences*, *14*(5), 425–430. https://doi.org/10.1016/j.jtumed.2019.08.003

Febriyanti, E. dan, & Mellu, A. (2020). Tingkat kecemasan mahasiswa keperawatan dalam menghadapi pandemi covid-19 di kota kupang. *Nursing Update: Jurnal Ilmiah Ilmu Keperawatan P-ISSN: 2085-5931 e-ISSN: 2623-2871*, *11*(3), 1–6. https://stikes-nhm.e-journal.id/NU/index

Fitria, L. I. (2020). Kecemasan remaja pada masa pandemi covid-19. *Jurnal Pendidikan Indonesia*, *6*(1), 1–4. https://doi.org/10.29210/120202592

Fitriasari, A., Septianingrum, Y., Budury, S., & Khamida. (2020). Stres pembelajaran online berhubungan dengan strategi koping mahasiswa selama pandemi covid-19. *Jurnal Keperawatan*, *12*(4), 985–992.

Girianto, P. W. R., Widayati, D., & Agusti, S. S. (2021). Butterfly hug reduce anxiety on elderly. *Jurnal Ners Dan Kebidanan (Journal of Ners and Midwifery)*, *8*(3), 295–300. https://doi.org/10.26699/jnk.v8i3.art.p295-300.

Handayani. (2020). Corona virus disease 2019. *Jurnal Respirologi Indonesia*, *40*(2),119–129. https://www.jurnalrespirologi.org/index.php/jri/article/view/101

Husnul Ikhsan, M., Widya Murni, A., & Rustam, E. R. (2020). Hubungan depresi, ansietas, dan stres dengan kejadian sindrom dispepsia pada mahasiswa tahun pertama di fakultas kedokteran universitas andalas sebelum dan sesudah ujian blok. *Jurnal Kesehatan Andalas*, *9*(1S), 74–81. https://doi.org/10.25077/jka.v9i1s.1158

Jarero, I. N., & Lucina, A. (2021). The EMDR Therapy butterfly hug method for self-administer bilateral. *Iberoamerican Journal of Psychotrauma and Dissociation*, *11*(May), 1–7.

Kementerian Pendidikan dan Kebudayaan No. 4. (2020). Surat Edaran Mendikbud No 4 Tahun 2020 Tentang Pelaksanaan Kebijakan Pendidikan Dalam Masa Darurat Penyebaran Corona Virus Disease (Covid- 19).

Lazzaroni, E., Invernizzi, R., Fogliato, E., Pagani, M., & Maslovaric, G. (2021). Coronavirus disease 2019 emergency and remote eye movement desensitization and reprocessing group therapy with adolescents and young adults: overcoming lockdown with the butterfly hug. *Frontiers in Psychology*, *12*(August), 1–9 https://doi.org/10.3389/fpsyg.2021.701381

Mawarti, I. (2021). Hipnosis lima jari pada klien ansietas. *Jambi Medical Journal*, *9*(3), 282–304.

Mirza & Claudia, C. (2021). Pelatihan regulasi emosi untuk meningkatkan subjective well-being pada penyandang tunarungu di Kota Binjai. *Jurnal Ilmiah Bimbingan Konseling Undiksha*, *12*(1), 21–30. https://ejournal.undiksha.ac.id/index.php/JIBK/article/view/32009

Monica, A. A. (2021). Efikasi diri dan strategi koping pada penyesuaian diri dokter muda. *9*(2), 187–204. https://doi.org/10.18592/jsi.v9i2.3839

Natalya, W. (warga terdampak covid 19 di Kecamatan Comal Kabupaten Pemalang. *University Research Colloqium*, 458–463. http://repository.urecol.org/index.php/proceeding/article/view/1230/1198

Niman, S. (2019). Effect of Expressive writing therapy towards the level of. *Jurnal Keperawatan Jiwa*, *7*(November), 179–184. https://www.researchgate.net/publication/337448929_effect_of_expressive_writing_therapy_towards_the_level_of_anxiety_analysis_of_victims_of_bull ying

Pardede, J. A. (2019). Optimalization of coping nurses to overcoming anxiety in the pandemic of covid-19 in era new normal. *Jurnal Peduli Masyarakat*, *2*(3), 105–112. https://doi.org/10.37287/jpm.v2i3

Original Research

The Application Of Intravenous Hydration Therapy In Patients Exposed To Contrast Agents For Prevention Of Contrast-Induced Nephropathy

Fitria Nurrohmawati[1], Rendi Editya D[2], Insiyah[3]

[1,2,3] Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia

ABSTRACT

Background: Contrast-Induced Nephropathy (CIN) is acute kidney injury caused by exposure to contrast media. Medical management involves pharmacological therapy. One approach to preventing CIN is intravenous hydration therapy, which rapidly expands renal volume to reduce renal vasoconstriction and accelerate contrast medium elimination.

Objective: This study aims to determine the application of intravenous hydration therapy in patients exposed to contrast agents for the prevention of CIN.

Methods: This study used a case study approach on patients exposed to contrast agents. The sample consisted of 2 respondents. Intravenous hydration therapy intervention was administered for 12 hours after exposure to contrast agents.

Results: After implementation for over 3 days, there was no increase in serum creatinine defined as CIN. The first respondent experienced a decrease in serum creatinine from 1.03 mg/dL to 0.7 mg/dL, while the second respondent experienced an increase in serum creatinine of 0.03 mg/dL from 0.78 mg/dL to 0.81 mg/dL.

Conclusion: Intravenous hydration therapy can prevent the occurrence of CIN

ARTICLE HISTORY
Received: September 15, 2025
Accepted: September 19, 2025

KEYWORDS
CIN, Contrast Medium, Intravenous Therapy

CONTACT
Fitria Nurrohmawati
nurrohmawatifitria859@gmail.com
Departement of Nursing Poltekkes Kemenkes Surakarta, Jln. Letjen Sutoyo, Mojosongo, Surakarta, Indonesia.

INTRODUCTION

According to Oglat (2024), contrast media play an important role in radiology by improving the visualization of internal body structures, thereby enabling more accurate diagnoses. The use of contrast media clarifies the differences between normal and pathological tissues, which is very helpful in identifying lesions, blood vessels, and delicate organs. This enables more precise diagnoses and more effective treatment planning, particularly in cardiovascular, oncology, and neurology cases. In addition, the use of contrast media has also been shown to increase sensitivity and specificity in detecting various medical conditions, such as tumors and vascular diseases, thereby contributing to more effective treatment planning (Almakhalas et al., 2023).

The use of contrast media in medical imaging procedures can cause various side effects in patients, ranging from mild reactions to serious complications. Common mild reactions include nausea, vomiting, and a sensation of heat, while severe reactions such as anaphylaxis and acute kidney injury (AKI) can also occur, especially in patients with certain risk factors. Repeated doses of contrast media increase the risk of contrast-induced nephropathy (CIN) in patients treated in cardiology departments (Cichon et al., 2023).

Contrast-Induced Nephropathy (CIN) is an acute decline in kidney function that occurs within 48 to 72 hours after intravenous contrast media administration, characterized by an increase in serum creatinine levels of ≥0.3 mg/dL or an increase of ≥1.5 times the baseline value. This condition is a serious complication that can cause significant morbidity and mortality, especially in patients with risk factors such as chronic kidney disease, diabetes, and advanced age. Although often temporary, CIN can cause permanent kidney damage in certain cases. The pathophysiological mechanisms of CIN involve the direct nephrotoxic effects of contrast media, hemodynamic changes, oxidative stress, and inflammatory responses (Fars et al., 2023).

A meta-analysis included 120 studies with more than 974,000 patients reported that the average incidence of CIN after angiography was approximately 9.06%, with a dialysis requirement of 0.52% (Wu et al., 2022). However, in certain patient groups, such as those undergoing high-risk interventional procedures, the incidence of CIN can reach 18% (Sambyal et al., 2024). These data indicate that CIN remains a significant complication in hospitals.

CIN prevention strategies vary widely across different sources. According to Suva et al (2022), prevention of CIN includes intravenous hydration, the use of iso-osmolar contrast agents, and the administration of pharmacological agents such as statins and N-acetylcysteine. The use of doses not exceeding 140 ml is one strategy for preventing the incidence of CIN (Liao et al., 2025). Other strategies, such as the role of biomarkers in early detection and risk stratification of CIN, including hydration protocols, pharmacological interventions, and procedural modifications, aim to reduce the incidence of CIN (Lee et al., 2025).

Intravenous hydration therapy is a key strategy in preventing Contrast-Induced Nephropathy (CIN) because it helps maintain renal perfusion and reduces contrast media toxicity. The mechanism involves increasing intravascular volume, which prevents renal vasoconstriction and accelerates contrast agent elimination through increased urine flow. Hydration also reduces the concentration of contrast media in the renal tubules, thereby decreasing oxidative stress and damage to tubular epithelial cells (Suva et al., 2022).

Another study evaluating the effectiveness of intravenous fluids, particularly isotonic saline, on the incidence of CIN was conducted by Zaki et al (2022), comparing it with other hydration therapy methods. The methods compared were oral hydration, isotonic hydration plus NAC or sodium bicarbonate, and half-isotonic fluids. The results of this comparison varied. However, it can be concluded that intravenous hydration with isotonic saline solution is effective in reducing the incidence of CIN.

This is in line with the meta-analysis study by Michel et al (2021) on intravascular volume expansion strategies to prevent CIN. This study explains that intravascular volume expansion or intravascular hydration compared to no

hydration shows a reduced risk of CIN in patients undergoing invasive angiography. The hydration methods used were also compared between intensive and standard hydration, with the intensive hydration method showing more significant results in reducing the incidence of CIN. In terms of duration, there were no significant differences, and it did not cause complications such as pulmonary edema.

MATERIALS AND METHODS

This research design is a case study of nursing care. The sample of this case study is two patients with Acute Coronary Syndrome (ACS) who have undergone Coronary Angiography examination up to Percutaneous Coronary Intervention. Where the procedure involves contrast agents. The research location in this case study was Soeradji Tirtonegoro Hospital in Klaten. This case study was conducted in June 2025 using observation and intervention methods. Prior to the study, the researchers submitted an Ethical Clearance application to the STIKES Nasional Surakarta health research ethics committee with the number 262/EC/KEPK/VI/2025.

Respondents were given fluid therapy for maintenance before exposure to contrast agents. After exposure to contrast agents, fluid intervention of 1-3 mL/kgBW/hour was administered for a minimum of 12 hours. After that, the fluid therapy rate was adjusted as at the start of maintenance. In the case study Application of Intravenous Hydration Therapy in patients exposed to contrast agents to prevent Contrast Induced Nephropathy (CIN), the author provided care using a nursing process approach, including stages such as assessment, diagnosis, intervention, implementation, and evaluation. The evaluation of this therapy is based on the amount of serum creatinine before CAG + PCI and after hydration. The evaluation is taken 48 hours after exposure to the contrast agent.

RESULTS

1. Assessment

Table 1 Assessment

	Mr. A	Mr. P
Age	38	65
Risk Factor	Smoker	Smoker and dyslipidemia
Screatinin Pre	1.03 mg/dL	0.78 mg/dL
Amount and type of contrast media	100 mL of Iohexol	100 mL of Iohexol

2. Diagnosis of Nursing Care

Both of the samples had the same nursing diagnosis according to PPNI (2017), first nursing diagnosis was D.0014 Risk of Ineffective Myocardial Perfusion. The second nursing diagnosis was D.0016 Risk of Ineffective Renal Perfusion. The nursing focus in this study was on the second diagnosis.

3. Intervention Of Nursing Care

The first nursing intervention or nursing diagnosis plan for Risk of Ineffective Myocardial Perfusion is Cardiac Care (I.02075). The second nursing intervention or nursing diagnosis plan for Risk of Ineffective Renal Perfusion is Shock Prevention (I.02068). This intervention is according to PPNI (2018a). The focus of nursing intervention in this case study was on the second

diagnosis, with shock management in the form of intravenous hydration therapy for at least 12 hours after exposure to the contrast agent at a rate of 1 – 3mL/kgBB/hour.

4. Implementation Of Nursing Care

In the actual implementation of hydration therapy, Mr. A received 77 mL/hour for 15 hours, and Mr. P received 55 mL/hour for 14 hours.

5. Evaluation Of Nursing Care

Table 2: Evaluation Of Serum Creatinine

Time	Serum Creatinin	
	Mr. A	**Mr. P**
Pre	1.03 mg/dL	0.78 mg/dL
Post	0.7 mg/dL	0.81 mg/dL

DISCUSSION

1. Assessment

a. Age

A recent study on CIN risk estimation followed 1,200 participants with various conditions. The results showed that each additional year of age was significantly associated with a 32% higher chance of developing CIN (OR = 1.32, $p<0.001$). However, after comparing and adjusting for other risk factors (DM, kidney disorders, hypotension, dialysis requirements, mortality, and even gender), age cannot be categorized as a significant predictor of CIN incidence (Shankar, 2024).

This is in line with the assessment conducted on Mr. A, aged 38, and Mr. P, aged 65. The onset of CIN cannot be predicted solely based on the patient's age. Additional supportive examinations or early detection of risk factors for CIN are necessary. Thus, the importance of early identification and risk management of CIN in patients undergoing procedures with contrast agents is emphasized (Shankar, 2024).

b. Risk Of Factor

Other supporting tests to detect risk factors in patients with significant CIN incidence are important. In both cases (Mr. A and Mr. P), risk factor tests such as coagulation, lipid profile, and immunology were performed. The results obtained during the assessment showed that Mr. A had above-normal coagulation values due to the effects of UFH as a treatment for DPJP, while the other results for lipid profile and immunology were within normal limits. The same examination on Mr. P showed coagulation values similar to those of Mr. A, with immunology within normal limits, while the total cholesterol level in the patient's lipid profile was above normal (226 mg/dL).

This supporting examination was used to detect risk factors for CIN, in line with a study conducted by Masoomi et al (2024), which emphasized the importance of understanding CIN predictors in emergency coronary angioplasty, given the observed increase in daily hospitalizations, related comorbidities, and AKI-related mortality. The findings indicate that heart failure, radial access, leukocytosis, hypercholesterolemia, and elevated BUN at admission are the primary risk factors for the CIN phenomenon. Additionally, metabolic syndrome, characterized by a cluster of conditions

including insulin resistance, hypertension, dyslipidemia, and obesity, has been reported in several studies as a stronger predictor of CIN (Chang et al., 2023).

c. SCr Pre

Serum creatinine level assessment is an initial factor that determines patient safety before exposure to contrast agents. This is related to determining whether there is pre-existing renal impairment and serves as a baseline for defining CIN (Ying et al., 2023). This measurement of serum creatinine levels aligns with research conducted by Olariu et al (2025), which estimated that serum creatinine levels before the procedure were significantly higher in the CIN group (1.41 mg/dL) compared to the non-CIN group (0.96 mg/dL), with a significance of $p<0.001$. In the second serum creatinine test, both patients, Mr. A (1.03 mg/dL) and Mr. P (0.78 mg/dL), were still within normal limits.

d. Amount and Type Of Contrast Media

The use of low-osmolality and iso-osmolality contrast media is recommended over high-osmolality contrast media. Consideration of the lowest dose and volume of contrast media during imaging procedures (PERNEFRI, 2023). During coronary angiography and percutaneous coronary intervention procedures on both patients (Mr. A and Mr. P), each was exposed to 100cc of iohexol contrast agent. The iohexol contrast media used during CAG and PCI procedures is low osmolality, ranging from 600 to 900 mOsm/kg H_2O, which is lower than previous contrast media, which ranged from 1,500 to 2,000 mOsm/kg H_2O.

A study on the amount and type of contrast agent used, conducted by Ying et al. (2023), explains that increasing the dose or amount of contrast agent during imaging can increase the incidence of CIN. Similar to other studies that emphasize the need to reevaluate current dose thresholds and develop tailored dose protocols to effectively minimize CIN incidence (Liao et al., 2025). The amount of contrast agent used in the examinations of Mr. A and Mr. P was 100 cc, which contributes to a score of 1 in the CIN risk calculation developed by Mehran (PERNEFRI, 2023).

2. Diagnose Of Nursing Care

The initial nursing diagnosis D.0014 Risk of Ineffective Myocardial Perfusion was confirmed by coronary artery spasm, as evidenced by an ECG showing anteroseptal STEMI and CAG showing a blockage in the LAD. This diagnosis was made based on the supporting data. According to SDKI PPNI (2017), the definition of Risk of Ineffective Myocardial Perfusion is the risk of decreased coronary artery circulation that can interfere with myocardial metabolism. STEMI originates from plaque rupture or thrombus formation that blocks the lumen of the coronary artery, either totally or partially, or becomes a microembolism that blocks the more distal coronary artery. Reduced coronary blood flow causes myocardial ischemia, which triggers the onset of characteristic chest pain (PERKI, 2024).

In both cases, there were similarities in the data, namely the ECG results upon admission to the hospital showing STEMI, which was then treated with fibrinolysis. When a CAG examination was performed, the results showed blockages in the LAD coronary artery with differences in the description of

proximal stenosis of 90% (Mr. A) and ostial mid stenosis of 30–85% haziness (Mr. P). Additionally, echocardiography results showed left ventricular remodeling (LV Concentric Remodeling). These symptoms led the author to establish a diagnosis of Risk of Ineffective Myocardial Perfusion.

The second diagnosis, D.0014 Risk of Ineffective Myocardial Perfusion, was confirmed by coronary artery spasm, as the ECG examination showed Anteroseptal STEMI and the CAG results showed a blockage in the LAD. Risk of Ineffective Renal Perfusion is defined as the risk of decreased blood circulation to the kidneys (PPNI, 2017). The selection of this second diagnosis is based on supporting data that appeared in both patients.

This diagnosis serves as a warning or effect of medical management of STEMI or other ACS in the form of coronary imaging with contrast agents. Patients exposed to contrast agents are at risk of Acute Kidney Injury due to the contrast media. This can occur due to renal vasoconstriction after contrast media administration, followed by increased release of endothelin (a potent vasoconstrictor) and decreased synthesis of prostaglandins and NO (nitric oxide), leading to reduced renal blood flow. Consequently, renal perfusion decreases (Cho & Ko, 2022).

3. Intervention of Nursing Care

The first nursing intervention or nursing diagnosis plan for Risk of Ineffective Myocardial Perfusion is Cardiac Care (I.02075). The definition of cardiac care, according to PPNI (2018a), is to identify, treat, and limit complications resulting from an imbalance between myocardial oxygen supply and consumption. Cardiac care interventions include observation, therapeutic, educational, and collaborative actions. The objectives and outcome criteria for this diagnosis are improved myocardial perfusion (L.02011) with decreased chest pain, decreased nausea and vomiting, improved blood pressure, and improved pulse rate.

The second nursing intervention or nursing diagnosis plan for Risk of Ineffective Renal Perfusion is Shock Prevention (I.02068). The definition of shock prevention, according to PPNI (2018a), is identifying and reducing the risk of the body's inability to provide oxygen and nutrients to meet tissue needs. Shock prevention interventions include observation, therapeutic, educational, and collaborative actions. The goals and outcome criteria for this diagnosis are improved Renal Perfusion (L.02013) with increased urine output and improved plasma creatinine levels.

4. Implementation Of Nursing Care

This intravenous hydration therapy is performed when the patient has completed a CAG procedure, which uses contrast media for imaging the coronary arteries. This measure is implemented for at least 12 hours immediately after the patient is exposed to contrast agents, with the aim of expanding the kidneys and helping to eliminate the contrast agents that entered during the CAG procedure. This also helps reduce the contact time of contrast agents on the renal tubules, thereby preventing CIN.

This implementation is in accordance with a study conducted by Chen et al (2023) entitled “Different Hydration Methods For The Prevention Of Contrast-Induced Nephropathy In Patients With Elective Percutaneous Coronary Intervention,” which compared the differences in pre- and post-

procedure hydration. Post-PCI hydration with 0.9% saline for 6-12 hours, while pre-PCI hydration with 0.9% saline for 6-12 hours, with a hydration rate of 1mL/kgBW/hour for both groups. The results of this study showed that the incidence of CIN in the post-PCI hydration group was 3.54%, while in the pre-PCI group it was 4.8%, with no statistically significant difference (p value = 0.478).

A similar study by Hu et al (2021) titled "Meta-Analysis Of The Effects Of Furosemide Combined With Hydration Therapy On Contrast-Induced Acute Kidney Injury After Coronary Intervention" also compared two different methods. The methods compared were standard hydration (1 mL/kgBW/hour) and standard hydration supplemented with furosemide injection. The results showed no significant difference in CIN incidence between the intervention and control groups (p-value = 0.62).

5. Evaluation Of Nursing Care

Based on the results of Evidence-Based Nursing (EBN) and PICOT journals, intravenous hydration after exposure to contrast agents helps expand blood volume and accelerates the elimination of contrast agents in the renal tubules, preventing the kidneys from experiencing vasoconstriction that can result in damage to the renal tubules (Chen et al., 2023). The contrast media used in the CAG procedure in both patients were low-osmolar, meaning they had a viscosity 2–3 times higher than blood. Another purpose of intravenous hydration is to dilute blood exposed to contrast media with higher viscosity, thereby reducing the workload on the kidneys (L. Liu et al., 2023).

The selection of a 12-hour implementation duration was based on a study titled "Waiting Times Between Examinations With Intravascularly Administered Contrast Media" on the half-life of contrast media under various conditions. This study concluded that the half-life of iodine-based contrast media in patients with normal kidney function (eGFR > 60 mL/min) is maximal at 12 hours (Molen et al., 2024). This recommendation aligns with the conditions of both patients, who have eGFR values of 105 (Mr. A) and 73 (Mr. P). Both patients' eGFR values are above normal, so intravenous hydration therapy at the rate recommended by PERNEFRI (2023) of 1–3 mL/kgBW/hour is administered for 12 hours.

Based on the above description, the administration of shock prevention intervention (I.02068), which consists of observation, therapy, education, and collaboration, involves intravenous administration at a rate of 1–3 mL/kgBW/hour for 12 hours in STEMI patients post-CAG + PCI with a nursing diagnosis (D.0016). The risk of ineffective renal perfusion, evidenced by hypoxemia, can be decreased by increasing renal perfusion. The researcher assumes that intravenous administration at a rate of 1–3 mL/kgBW/hour for 12 hours can prevent acute kidney injury caused by contrast or contrast-induced nephropathy (CIN).

CONCLUSSION

Based on the results of a case study on the application of intravenous hydration therapy in patients exposed to contrast agents for the prevention of contrast-induced nephropathy (CIN), the following conclusions can be drawn:

1. In the assessment, both patients had risk factors for CIN; Mr. P had hypercholesterolemia upon admission to the hospital. Both patients experienced anteroseptal ST-segment elevation myocardial infarction (STEMI) and underwent coronary angiography (CAG) + percutaneous coronary intervention (PCI) with exposure to 100 cc of the contrast agent iohexol.
2. Both patients received the same nursing diagnosis, referring to the Indonesian Nursing Association's Standard Diagnosis Classification (SDKI PPNI, 2017), namely (D.0014) risk of ineffective myocardial perfusion, evidenced by coronary artery spasm, and (D.0016) risk of ineffective renal perfusion, evidenced by hypoxemia.
3. Both patients received intervention (I.02068) for shock prevention, consisting of observation, therapeutic measures, education, and collaboration in the form of intravenous administration.
4. Implementation for both patients was carried out according to the nursing interventions that had been formulated. EBN intravenous hydration therapy was administered for 12 hours at a rate of 1–3 mL/kgBW/hour, and patients received nursing care for 3 x 7 hours.
5. Evidence-based nursing with intravenous hydration therapy in patients exposed to contrast agents can prevent CIN. Further research on similar topics is needed to add to the references on the prevention of CIN.

ACKNOWLEGDEMENT

Thanks you very much RS Soeradji Tirtonegoro Klaten especially Intensive Coronary Care Unit Room, which has supported this case study.

REFERENCES

Almakhalas, K. A., Almakhalas, M. A., Almalki, T. J., & Alqahtani, M. A. (2023). The Impact of Contrast Media on Image Quality in MRI: Simple Review Article. *Journal of Advance Zoology*, *44*(5), 1770–1780.

Chang, W. T., Liu, C. C., Huang, Y. T., Wu, J. Y., Tsai, W. W., Hung, K. C., Chen, I. W., & Feng, P. H. (2023). Diagnostic Efficacy of The Triglyceride–Glucose Index in The Prediction of Contrast-Induced Nephropathy Following Percutaneous Coronary Intervention. *Frontiers in Endocrinology*, *14*(November), 1–11. https://doi.org/10.3389/fendo.2023.1282675

Chen, F., Lu, J., Yang, X., Liu, D., Wang, Q., Geng, X., Xiao, B., Zhang, J., Liu, F., Gu, G., & Cui, W. (2023). Different Hydration Methods For The Prevention Of Contrast-Induced Nephropathy In Patients With Elective Percutaneous Coronary Intervention: A Retrospective Study. *BMC Cardiovascular Disorders*, *23*(1), 1–8. https://doi.org/10.1186/s12872-023-03358-w

Cho, E., & Ko, G. J. (2022). The Pathophysiology and the Management of Radiocontrast-Induced Nephropathy. *Diagnostics*, *12*(1), 180. https://doi.org/10.3390/DIAGNOSTICS12010180

Cichoń, M., Wybraniec, M. T., Okoń, O., Zielonka, M., Antoniuk, S., Szatan, T.,

& Mizia-Stec, K. (2023). Repeated Dose of Contrast Media and the Risk of Contrast-Induced Acute Kidney Injury in a Broad Population of Patients Hospitalized in Cardiology Department. *Journal of Clinical Medicine*, *12*(6). https://doi.org/10.3390/jcm12062166

Fars, Y. Y., Moghadasi, R., & Shayanpour, S. (2023). Contrast-Induced Nephropathy; An Update on Pathophysiology. *Journal of Renal Endocrinology*, *9*(April), e25099. https://doi.org/10.34172/jre.2023.25099

Hu, M. J., Luo, E. F., Tang, C. C., Wang, L., Zhang, Q. G., & Gong, J. B. (2021). Meta Analysis Of The Effects Of Furosemide Combined With Hydration Therapy On Contrast-Induced Acute Kidney Injury After Coronary Intervention. *European Review for Medical and Pharmacological Sciences*, *25*(14), 4729–4737. https://doi.org/10.26355/eurrev_202107_26383

Lee, P. H., Huang, S. M., Tsai, Y. C., Wang, Y. T., & Chew, F. Y. (2025). Biomarkers in Contrast-Induced Nephropathy: Advances in Early Detection, Risk Assessment, and Prevention Strategies. *International Journal of Molecular Sciences*, *26*(7), 1–42. https://doi.org/10.3390/ijms26072869

Liao, M., Yang, Y., Chen, Y., Zhou, Y., Zhou, W., Zhou, G., Wei, B., Xu, W., Li, Z., Lu, J., Zhang, B., & Guo, S. (2025). Personalized Contrast Agent Dosing to Prevent Contrast Induced Nephropathy in High Risk Populations in Guangdong, China. *Scientific Reports*, *15*(1), 1–11. https://doi.org/10.1038/s41598-025-91986-x

Liu, L., Li, W., Chen, H., & Li, H. (2023). Role Of Modified Hydration For Preventing Contrast-Associated Acute Kidney Injury In Patients With ST-Segment Elevation Myocardial Infarction. *Internal and Emergency Medicine*, *18*(1), 67–76. https://doi.org/10.1007/s11739-022-03109-3

Masoomi, Z., Nasirian, A. M., Namazi, M., Zangiabadian, M., Dayani, A., Shahidi, M., Saghafi, H., & Jolfayi, A. G. (2024). Prevalence of Contrast-Induced Nephropathy After Primary Percutaneous Coronary Intervention at A Tertiary Referral Hospital. *Journal Heliyon*, *10*(4), e25926. https://doi.org/10.1016/j.heliyon.2024.e25926

Michel, P., Amione-Guerra, J., Sheikh, O., Jameson, L. C., Bansal, S., & Prasad, A. (2021). Meta Analysis Of Intravascular Volume Expansion Strategies To Prevent Contrast Associated Acute Kidney Injury Following Invasive Angiography. *Wiley*, *98*(6), 1120–1132. https://doi.org/10.1002/ccd.29387

Molen, A. J. Van Der, Dekkers, I. A., Geenen, R. W. F., Bellin, M. F., Bertolotto, M., Brismar, T. B., Correas, J. M., Heinz-Peer, G., Mahnken, A. H., Quattrocchi, C. C., Radbruch, A., Reimer, P., Roditi, G., Romanini, L., Sebastià, C., Stacul, F., & Clement, O. (2024). Waiting Times Between Examinations With Intravascularly Administered Contrast Media: A Review Of Contrast Media Pharmacokinetics And Updated ESUR Contrast Media Safety Committee Guidelines. *European Radiology*, *34*(4), 2512–2523. https://doi.org/10.1007/s00330-023-10085-5

Oglat, A. A. (2024). A Review of Ultrasound Contrast Media. *F1000Research*, *12*,

1–13. https://doi.org/10.12688/f1000research.140131.3

Olariu, N., Maralescu, F. M., Bob, F., Grosu, I. D., Dragota-Pascota, R., Marc, L., Chisavu, L., Albai, O., Ratiu, I. A., Barac, S., Rață, A. L., Mzi, A., & Mihaescu, A. (2025). Contrast-Induced Nephropathy in Endovascular Patients: A Retrospective Cohort Study from a Vascular Surgery Clinic in Eastern Europe. *Journal of Clinical Medicine*, *14*(4), 1–12. https://doi.org/10.3390/jcm14041172

PERKI. (2024). *Pedoman Tata Laksana Sindrom Koroner Akut* (Edisi Ke-). PERKI.

PERNEFRI. (2023). Konsensus Gangguan Ginjal Akut. In *Perhimpunan Nefrologi Indonesia*. PERNEFRI. http://www.nber.org/papers/w16019

PPNI, T. P. S. D. (2017). *Standar Diagnosis Keperawatan Indonesia : Definisi dan Indikator Diagnostik* (Edisi 1. C). DPP PPNI.

PPNI, T. P. S. D. (2018a). *Standar Intervensi Keperawatan Indonesia : Definisi dan Tindakan Keperawatan* (Edisi 1, C). DPP PPNI.

Sambyal, B. S., Kansal, V., Nayak, A. K., Chauhan, P., & Jeldi, K. (2024). Contrast-induced Nephropathy: Incidence and Reversibility in Patients Undergoing High-risk Percutaneous Coronary Intervention. *Journal of Marine Medical Society*, 89–93. https://doi.org/10.4103/jmms.jmms_15_24

Shankar, H. (2024). Estimating Contrast-Induced Nephropathy Risk With A Simplified Score: A Cohort Study. *Student's Journal of Health Research Africa*, *5*(6), 6–11. https://sjhresearchafrica.org/index.php/public-html/article/view/1261

Suva, M., Kala, P., Poloczek, M., Kaňovský, J., Štípal, R., Radvan, M., Hlasensky, J., Hudec, M., Brázdil, V., & Řehořová, J. (2022). Contrast Induced Acute Kidney Injury and Its Contemporary Prevention. *Frontiers in Cardiovascular Medicine*, *9*(December), 1–24. https://doi.org/10.3389/fcvm.2022.1073072

Wu, M. Y., Lo, W. C., Wu, Y. C., Lin, T. C., Lin, C. H., Wu, M. S., & Tu, Y. K. (2022). The Incidence of Contrast-Induced Nephropathy and the Need of Dialysis in Patients Receiving Angiography: A Systematic Review and Meta-Analysis. *Frontiers in Medicine*, *9*(April), 1–9. https://doi.org/10.3389/fmed.2022.862534

Ying, J., Wang, J., Ying, Z., Ran, X., Zeng, X., Chen, D., Gao, Y., & Zhong, L. (2023). Exploring The Relationship Between Post-Contrast Acute Kidney Injury And Different Baseline Creatinine Standards: A Retrospective Cohort Study. *Frontiers in Endocrinology*, *13*(January), 1–9. https://doi.org/10.3389/fendo.2022.1042312

Zaki, H. A., Bashir, K., Iftikhar, H., Alhatemi, M., & Elmoheen, A. (2022). Evaluating the Effectiveness of Pretreatment With Intravenous Fluid in Reducing the Risk of Developing Contrast-Induced Nephropathy: A Systematic Review and Meta-Analysis. *Cureus*, *14*(5). https://doi.org/10.7759/cureus.24825

Original Research

Team Games Tournament Method for Increasing PMR Members' Skill of Fracture First Aid

Jelita Puriningsih[1], Maria Wisnu Kanita[1], Novita Kurnia Wulandari[1]

[1] Department of Nursing, Polytechnic of Health of Ministry of Health Surakarta, Indonesia

ABSTRACT

Background: *A fracture is a condition where the bone is broken and produces symptoms such as swelling, deformity and pain, which requires fast, precise and accurate treatment. Fractures are a type of accident that often occurs at school so proper first aid is needed, one of the first aid measures for fractures is a splint. Splinting has several goals, such as preventing movement, reducing the possibility of new injuries, reducing pain, and speeding up healing. However, before carrying out first aid you must understand the skills of proper splint dressing. So it is necessary to provide interesting education regarding splint dressing skills through the team games tournament method and the leaflet media lecture method. To determine the effect of the team games tournament method on splint dressing skills for fracture first aid in PMR members.*

Methods: *Used a quasi-experiment with a two-group pretest posttest design with control. The total sample was 67 respondents consisting of 34 intervention group respondents and 33 control group respondents.*

Results: *It showed that there is an influence of the team games tournament method on splint dressing skills for first aid for fractures with the mean value obtained being 17,500. The results of the Paired-t test obtained a significant figure of p = 0.000 because the p value was ≤ 0.05.*

Conclusion: *There is an influence of the team games tournament method on skills for fracture first aid in PMR members*

ARTICLE HISTORY
Received : September 15, 2025
Accepted: September 19, 2025

KEYWORDS
Team Games Tournament; Skill of Fracture First Aid; PRM

CONTACT
Maria Wisnu Kanita
Email of Corresponding Author
mwkanita@gmail.com
Department of Nursing Poltekkes of the Ministry of Health of Surakarta, Jln. Letjen Sutoyo, Mojosongo, Surakarta, Indonesia.

INTRODUCTION

Injuries are an emergency problem and cause very serious problems if not addressed in the right way. Readiness of knowledge and first aid skills in emergencies is a very important point to avoid worsening the patient's condition. Proper first aid for emergency problems in schools must be supported by sufficient knowledge. One of the problems of emergencies in schools is an accident (Fadilah et al., 2023).

Accidents that occur at school have various types, such as slips that cause tears or bruises, dislocations to fractures often occur at the age of 18 to 46 years. Accidents that occur at school usually cause injuries to the muscles and spine (Ayunda Febria Sari et al., 2024). Based on WHO data in 2017 and 2018, the prevalence of fracture incidence was

2.7% and 4.2% or around 18 million people and increased in 2019 to 4.5% or around 21 million people with fractures. Data from the Ministry of Health in 2020 shows that the incidence of fractures in Indonesia is 5.8 or 8 million, including closed fractures (Septiani et al., 2023).

An injury is originally defined as a violent event that hits the body (tissue) suddenly, hard and intensively. In school, injuries often occur during sports, the types of sports injuries are (1) bone injuries or fractures e.g. fractures of the shin or sole of the foot in long-distance runners, (2) muscle injuries e.g. muscle tears that often occur in the front thigh muscles (often in football), or calf muscles (often in tennis), (3) joint injuries e.g.: ligaments that are overstretched or even broken which causes the affected joint to become unstable (Widiastuti & Adiputra, 2022).

Fractures are included in musculoskeletal injuries. Fracture is one of the emergency conditions that requires immediate help to eliminate the threat to the victim's life (Apriyani, 2023). Fractures are when tissue is severed and produces symptoms such as swelling, deformities, and pain, which require fast, precise, and accurate treatment (Najihah & Ramli, 2019). The World Health Organization (WHO) cases of fractures occur in the world with a prevalence rate of 4.5%. There were approximately 10 million people with fractures in 2016. In 2017, it increased to 14 million people with a prevalence rate of 5.3%. The occurrence of these fractures includes sports injuries (Azaria Rebekah et al., 2023).

Providing first aid is one of the techniques given before getting help from doctors and medics with the aim of reducing more severe injuries. There are several types of first aid that can be performed by a variety of people, including Cardiopulmonary Resuscitation (RJP), heimlich maneuvers, and blindfolds (Ayunda Febria Sari et al., 2024).

Wrapping blinds is one of the rescue techniques by using objects that are flexible and rigid. With this blinding technique, it is given to the injured victim who will later perform a fixator and immobilizer on the injured area (Ayunda Febria Sari et al., 2024). Blindfold wraps are used to provide first aid to parts of the body that have broken bones or injuries to keep them stable and comfortable (Dewiyanti et al., 2023). This camouflage is used to reduce pain and prevent bone movement, which can damage surrounding soft tissue (Talibo et al., 2023). Secondary complications caused by the movement of bone fragments can be reduced with the first treatment with a blindfold (Dewiyanti et al., 2023). Important bidding is done to stabilize and rest the injured part. Bidding has several purposes, such as preventing movement, reducing the possibility of new injuries, reducing pain, and accelerating healing (Repsigama Psychology UGM, 2023).

To carry out proper bidding, it is necessary to provide health education and training regarding blindfolds. Health education and training on blindfolds need to be carried out to prevent injuries to the musculoskeletal system (Hariyadi & Setyawati, 2022). This is because the majority of fracture injuries at school come from sports. The community and high school students do not know how to provide first aid to fracture injuries, which cause more severe casualties (Hariyadi & Setyawati, 2022).

Several studies show that students' knowledge related to P3K is still lacking. One study showed that 43.3% of students had less knowledge about blindfolds. Another study showed that 27.7% of students still had poor knowledge of first aid measures (Ernasari et al., 2021).

Bidding Health Education can be done by all trained people. One of the ordinary people trained at the school is a student who has received basic emergency education. Emergency basic education is provided through extracurricular activities. Therefore, it is very important for PMR members to have knowledge about P3K, especially related to fracture management. With the knowledge they have, it is hoped that PMR members will be able to know how to perform P3K on fracture victims before being sent to the hospital so that more severe fracture complications can be avoided (Listia Rohmahna, Devi, 2019).

The education provided must be with a different method from the previous one so that it is easy to understand, one of which is using the Team Games Tournament (TGT) method. Team Games Tournament (TGT) is one way to provide education to students because it allows students to be actively involved in the learning process and have elements of play that appeal to students. One of the advantages of TGT is that students and their groups compete, which encourages them to improve their skills acquired from health education (Prasetyo et al., 2023). In a study conducted by Prasetyo (2023), it was found that Team Games Tournament (TGT) can increase school children's knowledge of first aid for minor injuries.

The purpose of this study was to determine the influence of the team games tournament method on the skill of blindfolding for first aid of fractures in PMR members.

MATERIALS AND METHOD

This study uses a quantitative approach. This study uses a pre-experimental design with a two-group pretest-posttest with control group design. The population in this study were PMR members at SMAN 1 Mojolaban which consists of grades 10-12 totaling 70 members. The sampling technique applied in the sampling of this study was the total sampling method. In this study, randomization was used to divide 2 groups, namely all respondents were collected and each mentioned numbers 1 and 2 sequentially, odd numbers for the intervention group and even numbers for the control group so that 34 respondents were obtained for the intervention group and 33 respondents for the control group. In this study, the number of samples was 67 respondents because 3 respondents were unable to attend and dropped out. Blindfold learning was given with the TGT method in the intervention group and blindfold learning leaflet media lecture method in the control group. For TGT in the intervention group, SOP for the implementation of Teams Games Tournament (Anika et al, 2018). The first aid skills of blindfolding a fracture use an observation sheet taken from the BTCLS Module of the Ministry of Health of the Republic of Indonesia (Ministry of Health, 2022). One group of research subjects was given an intervention with the team games tournament learning method and one group with the lecture learning method. Before the intervention is given, a pre-test is carried out to see the level of fracture' first aid skills, after the intervention is given, a post-test was carried out to see the level of fracture' first aid skills. Then it was seen if there was a change in fracture' first aid skills before and after the intervention.

The bivariate test used the paired-t test for the paired test, while the paired difference test used the Independent-T test. The Health Research Ethics Commission of Dr. Moewardi Surakarta Hospital has stated that this research has been declared feasible to be carried out with ethical clearance number 2.184/IX/HREC/2024.

RESULTS

Data collection was carried out on November 4 and November 8, 2024 on 67 PMR members at SMAN 1 Mojolaban. The researcher used 70 samples and experienced a dropout of 3 people because 1 student was sick and 2 were unable to attend.

Table 1. Distribution of the frequency of fracture' first aid skills before being given an intervention using the Team Games Tournament method in the intervention group

No.	Level Skills	Frequency	Percentage (%)
1	Highly skilled	0	0
2	Skilled	0	0
3	Quite skilled	0	0
4	Less skilled	18	52,9
5	Unskilled	16	47,1
	Total	34	100,0

The results showed that the skill level of blindfolding before being given the intervention with the team games tournament method, the majority of respondents had a less skilled skill level as many as 18 respondents (52.9%).

Table 2. Distribution of the frequency of the fracture's first aid skill after being given an intervention using the Team Games Tournament method in the intervention group

No.	Level Skills	Frequency	Percentage (%)
1	Highly skilled	17	50,0
2	Skilled	16	47,1
3	Quite skilled	1	2,9
4	Less skilled	0	0
5	Unskilled	0	0
	Total	32	100,0

The results showed that after being given the intervention with the team games tournament method, the majority of respondents had a very skilled skill level of 17 respondents (50.0%).

Table 3. Distribution of the frequency of fracture' first aid skills before being given the intervention by the lecture method in the control group.

No.	Level Skills	Frequency	Percentage (%)
1	Highly skilled	0	0
2	Skilled	0	0
3	Quite skilled	0	0
4	Less skilled	14	42,4
5	Unskilled	19	57,6
	Total	33	100,0

The results showed that the level of fracture' first aid skills before being given an intervention with the lecture method in the control group had an unskilled skill level of 19 respondents (57.6%).

Table 4. Distribution of the frequency of fracture' first aid skills after being given an intervention with the lecture method in the group

No.	Level Skills	Frequency	Percentage (%)
1	Highly skilled	10	30,3
2	Skilled	13	39,4
3	Quite skilled	10	30,3
4	Less skilled	0	0
5	Unskilled	0	0
	Total	33	100,0

The results showed that after being given an intervention with the lecture method, the majority of respondents in the control group had a skill level of 13 (39.4%).4%).

Table 5. Paired hypothesis test using the Paired-T Test

Variable	n	Mean	Std.Deviation	Asymp sig (2-tailed)
Skill level pre TGT of intervention group	34	5,41	2,883	,000
Skill level post TGT of intervention group	34	22,91	3,414	
Skill level Pre lecturing of control group	33	4,61	3,162	
Skill level Post lecturing of control group	33	20,67	3, 974	

The paired t-test on the level of Bidai wrapping skills before being given an intervention with the Team Games Tournament method and after being given an intervention with the Team Games method and the leaflet media lecture method above showed a significant p-value of < 0.05. Both intervention and control groups obtained a p-value of 0.000, showing that both interventions were influential in improving the skills of blindfolding for first aid for fractures in PMR members of SMAN 1 Mojolaban.

Table 6. Paired hypothesis test using the Paired-T Test

Variable	n	Mean	Std.Deviation	Asymp sig (2-tailed)
Skill level TGT of intervention group	34	22,91	3,414	.016
Skill level lecturing of control group	33	20,67	3, 974	.016

The results of the paired difference test using the Independent-T Test obtained a p-value or Asymp sig (2-tailed) value of 0.016, where the p-value < 0.05 so that it can be concluded that there is a difference between the learning method of the team games tournament method and the leaflet media lecture method on the skill of wrapping blinds for first aid of fractures in PMR members.

DISCUSSION

Based on the paired-t test on the level of blindfold skills after being given an intervention with the Team Games method, it showed a significant value of 0.000 < 0.05, meaning that TGT had an effect on improving blindfold skills for first aid for fractures in PMR members of SMAN 1 Mojolaban. The team games tournament method has several advantages, one of which can improve cognition and improve skills as well. This is in line with research conducted by Nuari (2019) which showed that there was a difference in cognitive abilities in disaster management preparedness before and after the test, with p = 0.000 and p = 0.000 respectively. The Team Game Tournament (TGT) method has an impact on the cognitive abilities and skills of high school students in preparing themselves to face disasters. Because it is simple and engaging, TGT can be an alternative method for improving cognitive abilities and skills.

Team games tournament is an interesting method because students are not only watching but also participating. In research from Al Maulidah (2023), the results of the study showed that using the action research method with the TGT model was more effective than using image media. In line with the results of a literature review from Rachman (2021), which concluded that the TGT learning model requires students to actively participate in the learning process, it can be concluded that the application of this model can increase the completeness of basketball learning. This conclusion is based on the results of a literature review from various sources. The learning model makes students responsible and can work together to achieve predetermined goals. Indirectly, games require students to master the material given. As a result, learning is carried out in a fun atmosphere, so that students can more easily understand what is being taught.

The team games tournament method can improve student learning outcomes. In addition, research from Akhmad Aji Pradana (2019) concluded that the TGT type cooperative learning model and the learning model through audiovisual media can improve the learning outcomes of volleyball bottom passing skills, as shown in the discussion of the research results. Research from Fauzi (2024) obtained results that the TGT cooperative learning model uses four components in the first and second meetings; The award component is only used at the third meeting, but the score of the first meeting is used to determine it. Learning outcomes in the experimental class and the average control class were not the same. The learning outcomes in the experimental class before and after the TGT method changed more than in the control class using the direct learning method. Thus, the learning outcomes of students in grade IV about mathematical flat building materials are influenced by the TGT learning method.

Research from Sabila (2021) shows that there is a significant difference between learning outcomes before the implementation of the TGT-type cooperative learning model and learning outcomes after the application of this model, as shown by the t-calculation value of 22.911 greater than the t-table value (2.042); 2) the TGT type cooperative learning model is quite effective in improving learning outcomes.

Through team games, tournaments, respondents not only understand but also practice tolerance in the group. In line with the research from Kamila (2024), this study shows that after the implementation of learning with the TGT model, students' tolerance attitudes have increased. This can be seen from the average score of students who continue to increase from cycle I to cycle III and the score is better in classes that do learning with TGT than in conventional classes. Because by forming heterogeneous groups, TGT encourages interaction, discussion, and problem-solving among students. So that the application of learning through TGT can increase mutual respect, respect, and acceptance of differences between students. It can be concluded that the TGT type cooperative learning model can be used as a strategy to increase students' tolerance, of course, with various innovations to make learning more diverse.

The team games tournament method has the advantage of increasing activeness in the learning process. In line with research from Tournament (2024), the TGT learning model is seen as able to cause the classroom atmosphere to be more active and interactive as a whole so that student learning outcomes are achieved in accordance with learning objectives. Learning using the TGT model received a positive response as evidenced by the successful implementation of the TGT model in learning that took place smoothly, active participation from students in participating in learning and working on news text worksheets.

CONCLUSION

Based on the results of the analysis test using the paired-t test, a p value of 0.000 < 0.05 was obtained and an independent-t test on the level of first aid skills of the blindfold after and before being given an intervention using the team games tournament and lecture learning method, both of them got a p-value or Asymp sig (2-tailed) value of 0.016, where the p-value < 0.05 which means that this method has an effect on increasing the skill level the provision of first aid with fracture' first aidto members of PMR SMAN 1 Mojolaban. This research is expected to be a contribution of new knowledge for all nurses, especially the nursing sector used in the process of providing health education using the TGT method to the community.

REFERENCES

Akhmad Aji Pradana. (2019). Pengaruh Model Pembelajaran Kooperatif TGT dan Pembelajaran Berbasis Audiovisual Terhadap Passing Bawah Bolavoli. Tadris: Jurnal Penelitian Dan Pemikiran Pendidikan Islam, 11(1), 71–85. https://doi.org/10.51675/jt.v11i1.16

Al Maulidah, N., Dhari, F. S. W., Widodo, S. T., & Aristiyowati, H. (2023). Pengaruh Model Teams Games Tournament (TGT) dalam Mengembangkan Sikap Taat Peraturan pada Siswa Sekolah Dasar. Jurnal Basicedu, 7(6), 3781–3792. https://doi.org/10.31004/basicedu.v7i6.6390

Apriyani, A. (2023). Pertolongan Pertama Pada Fraktur. Khidmah, 5(1), 131–137. https://doi.org/10.52523/khidmah.v5i1.450

Ayunda Febria Sari, Aliva Rena Putri Rokhiyah, & Didik Iman Margatot. (2024). Edukasi Dini Dan Simulasi Pertolongan Pertama Manajemen Fraktur. Empowerment Journal, 4(1), 36–42. https://doi.org/10.30787/empowerment.v4i1.1441

Ayunda Febria Sari, Aliva Rena Putri Rokhiyah, & Didik Iman Margatot. (2024). Edukasi Dini Dan Simulasi Pertolongan Pertama Manajemen Fraktur. Empowerment Journal, 4(1), 36–42. https://doi.org/10.30787/empowerment.v4i1.1441

Azaria Ribka, H., Zenitha Victoria, A., & Heri Yono, N. (2023). Gambaran Penerimaan Diri pada Pasien Fraktur An Overview of Self Acceptance on Fracture Patients. Jurnal Keperawatan Sumba, 2(1), 11–20. https://jurnal.poltekkeskupang.ac.id/index.php/jks

Dewiyanti, Kamriana, Zainuddin, Alwi, & Rahmadani, F. (2023). Pengaruh Edukasi Berbasis Video Terhadap Pengetahuan Balut Bidai Pertolongan Pertama Fraktur Tulang Pada Masyarakat Di Wilayah Kerja Puskesmas Polongbangkeng Selatan. Jurnal Ilmiah Keperawatan (Scientific Journal of Nursing), 9(1), 149–155. https://doi.org/10.33023/jikep.v9i1.1374

Ernasari, E., Kaelan, C., & Nurdin, A. A. (2021). The Effect of Splint Dressing Training on Knowledge of Fracture Management in PMR Members at Vocational Schools in Makassar City. An Idea Health Journal ISSN, 1(01), 36–42.

Fadilah, R., Fradianto, I., Fauzan, S., Mita, M., & Fahdi, F. K. (2023). Gambaran Pengetahuan Penanganan Cedera Sprain & Strain pada Siswa/I di Sekolah Menengah Pertama Pondok Pesantren Hidayatul Muslimin 2. MAHESA : Malahayati Health Student Journal, 3(4), 1010–1022. https://doi.org/10.33024/mahesa.v3i4.10122

Fauzi, A., & Masrupah, S. (2024). Pengaruh Model Pembelajaran Kooperatif Tipe Team Games Tournament (TGT) Terhadap Hasil Belajar Siswa. Ngaos: Jurnal Pendidikan Dan Pembelajaran, 2(1), 10–20. https://doi.org/10.59373/ngaos.v2i1.7

Hariyadi, H., & Setyawati, A. (2022). Pengaruh Metode Demonstrasi Teknik Pembidaian pada Anggota PMR Terhadap Pertolongan Pertama Fraktur. JPKM: Jurnal Profesi Kesehatan Masyarakat, 3(1), 59–67. https://doi.org/10.47575/jpkm.v3i1.295

Kamila, N., Hanim, W., & Hasanah, U. (2024). Model Pembelajaran Kooperatif Tipe Team Games Tournament (TGT) dalam Meningkatkan Sikap Toleransi Peserta Didik. Jurnal Basicedu, 8(2), 1545–1553. https://doi.org/10.31004/basicedu.v8i2.7391

Listia Rohmahna, Devi, E. dan A. R. O. (2019). Pengaruh Pelatihan Balut Bidai Terhadap Pengetahuan Dan Keterampilan Siswa Di SMA N 4 Kota Bengkulu. Chmk Nursing Scientific Journal, 3(Balut Bidai, Pelatihan, Pengetahuan dan Keterampilan).

Najihah, & Ramli, R. (2019). Pendidikan Kesehatan Pertolongan Pertama pada Kecelakaan Meningkatkan Pengetahuan Anggota PMR tentang Penanganan Fraktur. Jurnal Penelitian Kesehatan Suara Forikes, 10(2), 151–154. http://forikes-ejournal.com/index.php/SF

Nuari, N. A., & Syndrome, D. B. (2019). Kemampuan Kognitif Dan Skill Dalam Kesiapsiagaan. August. https://doi.org/10.32831/jik.v7i2.207

Prasetyo, S. I., Wulanningrum, D. N., & Kanita, M. W. (2023). Pertolongan Pertama Luka Ringan Dengan Metode Teams Games Tournament (TGT). 1(1), 43–47.

Rachman, A. W. N. A., & Kartiko, D. C. (2021). Pengaruh Model Pembelajaran Kooperatif TGT (Teams Games Tournament) Terhadap Ketuntasan Belajar Shooting Bola Basket. Jurnal Pendidikan Jasmani Olahraga Dan Kesehatan, 9(1), 193–203. https://ejournal.unesa.ac.id/index.php/jurnal pendidikanjasmani/article/view/38113/33699

Repsigama Psikologi UGM. (2023). Kelas Medis Internal Repsigama: Get to Know about First Aid (Bidai & Mitela). Universitas Gadjah Mada, 3–7. https://repsigama.psikologi.ugm.ac.id/2023/07/07/kelas-medis-internalrepsigama-get-to-know-about-first-aid-bidai-mitela/

Sabila, R. F., & Isroah. (2021). Pengaruh Model Pembelajaran Kooperatif Tipe Team Game Tournament (TGT) terhadap Hasil Belajar Akuntansi Dasar Kompetensi Jurnal Penyesuaian Siswa Kelas X Akuntansi. Kajian Pendidikan Akuntansi Indonesia, 10(1), 1–13. https://journal.student.uny.ac.id/index.php/kpai/article/view/17645%0A

Septiani, T. A., Olivia, N., & Sayfrinanda, V. (2023). Studi Kasus: Asuhan Keperawatan Pada Pasien Fraktur Tertutup Dengan Gangguan Rasa Aman Nyaman Nyeri Melalui Tindakan Pemberian Kompres Dingin Di Rumah Sakit Tk Ii Putri Hijau Medan. SENTRI: Jurnal Riset Ilmiah, 2(5), 1401–1405. https://doi.org/10.55681/sentri.v2i5.820

Talibo, N. A., Katuuk, H. M., Riu, S. D. M., & Pattinasarani, N. S. (2023). Pengaruh Edukasi Pembidaian Terhadap Pengetahuan Mahasiswa Dalam Memberikan Pertolongan Pertama Pada Fraktur Tulang Panjang Norman. Jurnal Keperawatan, 15(1), 381–388.

Widiastuti, N. K. P., & Adiputra, I. M. S. (2022). Gambaran Tingkat Pengetahuan Siswa tentang Pertolongan Pertama pada Kecelakaan di Sekolah Menengah Atas. Jurnal Akademika Baiturrahim Jambi, 11(1), 23.

9TH International Nursing Conference

Original Research

The Effect of Positive Affirmation Therapy on Anxiety in Patients with Chronic Kidney Failure Undergoing Hemodialysis at Dr. Moewardi Surakarta Hospital

Vian Surya Pratama[1], Febriana Sartika Sari[2], Insiyah[3]

[1] Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia
[2] Unit Medical of Dr Moewardi Hospital, Indonesia

ABSTRACT

Chronic Kidney Failure is a condition in the endocrine system characterized by gradual and irreversible damage to the nephrons, leading to a decrease in the regulatory and aesthetic function of the kidneys, resulting in an imbalance of body fluids and electrolytes (Nurfatin *et al.*, 2023). Kidney failure is one of the top ten causes of death at a global level. According to the World Health Organization (WHO), in 2019, there were more than 1.3 million cases of kidney failure, with 198,735 cases in Indonesia reported by the *Indonesian Renal Registry* (IRR) in 2018. In addition, the number of cases of kidney failure in Central Java in 2018 reached 96,794 people. Based on the history of kidney failure patients at Dr. Moewardi Surakarta Hospital in 2024 from June to August, with hemodialysis procedures totaling 717, of which 429 were in men and 288 in women, in the Flamboyan 4.

Background: Hemodialysis is a treatment for patients with chronic kidney failure, but the procedure often causes psychological problems, particularly anxiety, due to pain, nausea, weakness, vomiting, blood vessel infections, bleeding, and fear of death. Positive affirmation therapy is an independent intervention that helps reduce anxiety by allowing patients to write, express, and listen to positive statements, stimulating the release of happiness-related hormones.

Methods: Quantitative with *a quasi-experimental one-group pre- test and post-test design.* Interventions were given over a period of 2 weeks with 4 sessions as mentoring and 3 sessions conducted independently. The selection of samples with *purposive sampling* of 5 respondents was calculated using *the lameshow* formula.

Result: The results of *the paired analysis of t-test samples* showed a decrease in anxiety levels with *a p value* of 0.000 and a mean before intervention of 50.84 to 23.96 which means that there is a positive affirmation therapy effect on anxiety in patients with chronic kidney failure undergoing hemodialysis ***Conclusion:*** Positive affirmation therapy has an effect on reducing anxiety in hemodialysis patients at Dr. Moewardi Surakarta Hospital, so that positive affirmation therapy can be done by patients to reduce anxiety.

ARTICLE HISTORY
Received: September 15, 2025
Accepted: September 19, 2025
KEYWORDS
Positive Affirmation[1]; A Anxiety; C Chronicy F Failure; HeHemodialysis 4
CONTACT
Vian Surya Pratama
viansuryapratama04@gmail.com
Departemen of Nursing Poltekkes Kemenkes Surakarta, Jln. Letjend Sutoyo Mojosongo Surakarta, Indonesia

INTRODUCTION

Chronic Kidney Failure is a condition in the endocrine system characterized by gradual and irreversible damage to the nephrons leading to a decrease in the regulatory and aesthetic function of the kidneys, resulting in an imbalance of body fluids and electrolytes (Nurfatin *et al.*, 2023). This disease causes kidney function to slow down so that the kidneys cannot function optimally in excreting metabolic waste (Wachidah & Febina, 2022). Kidney failure is one of the top ten causes of death at a global level. By *World Health Organization* (WHO) Kidney failure in 2019 was more than 1.3 million people, with 198,735 cases in Indonesia reported by *Indonesian Renal Registry* (IRR) in 2018. In addition, the number of cases of kidney failure in Central Java in 2018 reached 96,794 people. Based on the history of kidney failure patients at Dr. Moewardi Surakarta Hospital in 2024 from June to August with hemodialysis procedures totaling 717 of which 429 were in men and 288 in women. In the Flamboyan 4 inpatient room from June to August 2024, there were 176 patients with 4 women undergoing hospitalization, 93 men and 66 women who had gone home and 7 men and 6 women who had died.

Healing kidney function requires hemodialysis which is carried out two to three times a week with intervals of four to five hours to extend life expectancy (Yuniartika & Febina, 2022). Treatment of patients with kidney failure by undergoing hemodialysis to improve kidney function by converting solutes in the blood into dialysate fluid or vice versa with a device *Dyalizer* thus helping the production of metabolic waste (Malinda *et al.*, 2022). Kidney failure disease cannot be completely cured with hemodialysis, but only helps restore kidney function. The action of hemodialysis can result in nausea, vomiting, headache, chest pain, *diffusion, osmosis,* hypotension, muscle cramps, itching, fatigue and fever (Zees & Lapradja, 2021). In addition, complex problems can have an impact on psychiatric conditions, such as anxiety before, during, and after the procedure, thereby interfering with the patient's compliance in carrying out hemodialysis(Wahida *et al.*, 2023). Hemodialysis also causes physiological decline that causes psychological disorders such as anxiety due to experiencing pain, changes in roles in the family, job loss, and even fear of death (Nurfatin *et al.*, 2023).

According to research (Squirting, 2018), there were 5 (62.5%) out of 8 clients with hemodialysis treatment experiencing anxiety. Supported by research, Orchids et al (2023) 95% of kidney failure patients experienced anxiety due to the first hemodialysis procedure. To reduce anxiety, pharmacological actions can be taken with drugs such as *alprazolam, triazolobenzodiazepine, and non-pharmacological measures such as positive affirmation therapy (Joel et al*., 2021). Positive affirmation is therapy that is carried out by instilling positive sentences that the patient has so that it affects the thoughts, feelings, and actions taken; in addition to that, the positive sentences expressed are able to give confidence to the patient (Harisa *et al*., 2023). Positive affirmations affect physical and psychological well-being by creating a feeling of comfort and calm due to the presence of anti-stress hormones so that it gives rise to a feeling of relaxation and forms a positive emotional response (Zainiyah *et al.*, 2018). Positive sentences encourage a person to have confidence in themselves because of the stimulus of the parasympathetic nervous system and the sympathetic nerve, which causes the secretion of endorphin hormones so that blood pressure and tension in the body decrease (Harisa *et al.*, 2023). Several similar studies conducted by KK & Akbar (2023), Kusumastuti et al. (2017), and Wijaya & Rahayu (2019) regarding positive affirmation therapy prove that the therapy Affirmation Positive can help reduce anxiety about hemodialysis.

MATERIALS AND METHODS

Quantitative research with a *quasi-experimental one-group pretest-posttest.* The research was carried out in the Flambotan 4 hemodialysis room of Dr. Moewardi Surakarta Hospital from September 9, 2024, to October 3, 2024. The subjects of this study consisted of a group with the same treatment, positive affirmation therapy, as many as 25 respondents based on Purposive sampling inclusion criteria, including kidney failure patients aged 20-70 years, undergoing hemodialysis at Dr. Moewardi Surakarta Hospital, and experiencing anxiety with a score of ≥45. Prior to the research, the researcher had completed *the Ethical Clearance* of the Ethics Commission at Dr. Moewardi Hospital with Number 1.883/VII/HREC/2024. Data were collected using *the Zung Self-Rating Anxiety Scale* (SAS/SRAS) from 20 question items. Interventions were given for seven sessions in a span of 2 weeks, where 4 sessions were with mentoring, three sessions were independent, each session had 10-15 minutes with a book to facilitate the writing work, and a reminder of the affirmation words used. Statistical analysis using *a paired sample t test* because the data is normally distributed.

RESULTS

Table 1 Frequency by Sex (n=25)

Gender	Frequency	%
Man	10	37,0
Woman	15	55,6

Based on table 1, 15 respondents (55.6%) are dominated by female respondents.

Table 2 *Crosstab* Anxiety by Gender (n=25)

Gender	Usual		Light		N	Total
	Frequency	%	Frequency	%		
Man	0	0	10	37,0	10	37,0
Woman	0	0	15	55,6	15	55,6

Based on table 2, the level of anxiety is in mild anxiety with 15 respondents (55.6%) dominated by women

Table 3 Frequencies by Age (n=25)

Age Category	Frequency	%
Teenager (13 – 24 years old)	2	7,4
Early Adult (26 – 35 years old)	2	7,4
Late Adult (36 – 45 years old)	4	14,8
Early Elderly (46 – 55 years old)	15	55,6
Late Elderly (56 – 65 Years)	2	7,4

Based on table 3, respondents are dominated by the early elderly (46 – 55 years) with a total of 15 respondents (55.6%).

Table 4 *Anxiety Crosstabs* by Age (n=25)

Age	Usual		Light		N	Total
	Frequency	%	Frequency	%		
Teenager (13 – 24 years old)	0	0	2	7,4	2	7,4
Early Adult (26 – 35 years old)	0	0	2	7,4	2	7,4
Late Adult (36 – 45 years old)	0	0	4	14,8	4	14,8
Early Elderly (46 – 55 years old)	0	0	15	55,6	15	55,6
Late Elderly (56 – 65 Years)	0	0	2	7,4	2	7,4

Based on table 4, the level of anxiety is in mild anxiety dominated by the early elderly (46-55 years) by 55.6%.

Table 5 Frequencies by Education (n=25)

Characteristic	Frequency	%
	2	7,4
Junior High School	8	29,6
High School/High School	9	33,3
Bachelor	6	22,2

Based on the table of 5 education levels, the most undergoing hemodialysis is high school/high school as many as 9 respondents (33.3%).

Table 6 *Crosstab* Anxiety Levels by Education (n=25)

Education	Usual		Light		N	Total
	Frequency	%	Frequency	%		
SD	0	0	2	7,4	2	7,4
Junior High School	0	0	8	29,6	8	29,6
High School/High School	0	0	9	33,3	9	33,3
Bachelor	0	0	6	22,2	6	22,2

Based on table 6, many respondents with high school/high school education experienced 9 respondents (33.3%).

Table 7 Anxiety Before Intervention (n=25)

Variable Emergency Before Intervention	Frequency	%	Mean	Median Min-Max)	Standard Deviation
Normal Anxiety (20-44)	0	0			
Mild Anxiety (45-59)	25	100	50,84	2,00 (45-59)	4,190
Moderate Anxiety (60-74)	0	0			
Severe Anxiety (75-80)	0	0			

Based on Table 7, the results of 25 respondents (100%) with mild anxiety were found before the intervention was carried out.

Table 8 Post-Intervention Anxiety (n=25)

Variable	Frequency	%	Mean	Median (Min-Max)	Standard Deviation
Anxiety After Intervention					
Normal Anxiety (20-44)	25	100	23,96	24,00 (21-30)	2,354
Mild Anxiety (45-59)	0	0			
Moderate Anxiety (60-74)	0	0			
Severe Anxiety (75-80)	0	0			

Based on Table 8, it was found that after the intervention, the results of 25 respondents (100%) were not anxious (normal).

Table 9 Effect of Positive Affirmation Interventions on Anxiety (n=25)

Variable	Score
	p value
Anxiety	0,000

Table 9: The results of the paired t-test analysis with p-value = 0.000 < 0.05, where Ha was accepted, so that there was a positive affirmation effect on the anxiety of chronic kidney failure patients undergoing hemodialysis at Dr. Moewardi Surakarta Hospital.

DISCUSSION

Characteristics by gender

The majority of respondents were women with a percentage of 55.6%. Based on research by Heriansyah, Aji Humaedi (2019), Salsabila *et al*. (2024) Male sex has the potential to double the incidence of kidney failure, which is influenced by unhealthy habits, burdens that must be borne, smoking habits, so that it causes the emergence of diseases that cause kidney failure, such as diabetes mellitus, hypertension, cancer, etc. This is in contrast to what was found in the Flamboyan Hemodialysis Room 4 of Dr. Moewardi Surakarta Hospital, where respondents who are undergoing hemodialysis are more dominated by women. In line with Rustandi *et al*.,(2018); Farhani, (2024); Grace *et al.*,(2021) Many respondents who undergo hemodialysis are experienced by women because women have a shorter urinary tract structure that makes it easier to experience urinary tract infections, in addition to that pregnant women often experience high blood pressure which causes hemodicular changes, thereby increasing renal plasma flow which makes kidney performance heavy (Prosperous) *et al*., 2022). The use of cosmetics that are not in accordance with the regulations governing distribution permits is one of the causes of kidney failure in women. The use of bleaching cosmetics containing Mercury, Retinoic Acid, Hydroquinone, and corticosteroids causes kidney system disorders *(*Hadriyati *et al*., 2020).

Characteristics by age

The respondents were dominated by the early elderly (46-55 years old). In line with Mait *et al*. (2021), Many cases of kidney failure occur at the age of 45-64 years (60%). Patients with chronic kidney failure are often found at the age of 45-64 years or older due to a decline in body function exacerbated by the onset of the disease. Degenerative disease causes the kidneys to work harder, so that damage to the kidneys occurs (Shabirah, 2019). According to (Santoso *et al.*, 2022) The length of hemodialysis that a person undergoes in the treatment process is based on the severity of kidney failure experienced ranges from 1 year to 11 years, this causes a person to experience a change in age status which initially becomes early adulthood to late adulthood, late adulthood to early adulthood, early elderly, and elderly.

The hemodialysis process undergone during the lifetime of patients with chronic kidney failure causes physical changes characterized by easy leg cramps, often weakness, frequent fainting, swelling in the legs, and changes in body image characterized by changes in skin pigment characterized by blackening of the feet, hands, and other anatomical areas of the body causing anxiety in hemodialysis patients (Kristianti *et al.*, 2020). Anxiety in the elderly tends to be more difficult to overcome because they often experience various problems, but it is possible that in old age, they cannot control it due to the pain experienced (Manurung, 2018).

Characteristics based on education

Respondents were dominated by high school/high school education as many as 9 respondents (33.3%). The higher the education, the higher the standard of living and the demands of work, causing a person with higher education to pay less attention to the nutritional needs of the body, making kidney performance heavier, making him more vulnerable to kidney failure (Putri & Afandi, 2022). The higher a person's level of education, the better they will understand the condition of their body and if they feel signs of symptoms of a disease, they will immediately check at the nearest health facility (Sulviana & Kurniasari, 2021).

Anxiety levels before intervention

The anxiety level before the intervention was experienced as mild, with a mean value of 50.84. The mild anxiety experienced by the patient is due to the tension, so that the individual will be more careful than usual. This condition can be characterized by high blood pressure, short breath, lethargic face, trembling lips which then the individual will experience a feeling of unease, tremors, and a raised voice, but it is a condition of anxiety that can be overcome with action *Non-pharmacological* because individuals who experience mild anxiety are still in a conscious state and can think rationally (Padila *et al.*, 2021). Powered by Stuart & Stuart (2019); Squirt *et al.* (2018); Mufidah et al. (2024); Sumah (2020). It shows that in patients with kidney failure, many experience mild anxiety when undergoing hemodialysis treatment. According to (Natashia) *et al.*, 2020) Hemodialysis measures that are carried out throughout life make chronic kidney failure patients accustomed to it, and ignore the symptoms arising from the process because they already know the cause of the treatment, but it is possible that they think that the result makes the emergence of binding anxiety, because anxiety has a nature that can change according to their mood through what they see, heard, and felt.

Anxiety levels after the intervention

The level of anxiety after positive affirmation therapy was in the category of not anxious with a percentage of 100%. According to Astuti *et al*. (2022), Anxiety in carrying out hemodialysis actions can be controlled through Pharmacological and nonpharmacological actions, resulting in a decrease in anxiety. Powered by KK & Akbar (2023); Wijaya & Rahayu (2019); Kusumastuti *et al*. (2017), positive affirmation therapy has an effect in helping to reduce anxiety in hemodialysis patients, as evidenced by the change in anxiety levels after the intervention from moderate to mild and from mild to normal.

Effect of positive affirmation therapy on anxiety in patients with kidney failure

The results of the analysis showed a significant effect of positive affirmation therapy in reducing anxiety in patients with chronic kidney failure undergoing hemodialysis. Powered by KK & Akbar (2023); Wijaya & Rahayu (2019); Kusumastuti *et al*. (2017). There is a change in anxiety levels after the intervention from moderate to mild anxiety and from mild anxiety to normal. Positive affirmation is an additional therapy that can be done independently to help reduce psychological disorders such as anxiety, positive affirmation

therapy helps individuals to increase the maladaptive coping mechanism to be adaptive which can manipulate a person's brain to become confident, confident, optimistic to something that is done through positive sentences that are arranged in the form of writing then spoken, listened to to others repeatedly (Wijaya & Rahayu, 2019). Positive affirmation can also help individuals focus more on the goals they want to achieve, such as individuals experiencing terminal illness to be cured, and anxiety during the treatment process, carried out with positive sentences written, spoken, and listened to repeatedly, can trigger an increase in the production of endorphin hormones that make individuals calmer, comfortable, and peaceful (Zainiyah *et al*., 2018).

CONCLUSION

1. The characteristics of the respondents were dominated by females (55.6%), early elderly (46-55 years) (55.6%), and high school/high school education level (33.3%)
2. The majority of respondents' anxiety levels before positive affirmations were at the level of mild anxiety, amounting to 25 respondents.
3. The anxiety level of the respondents after positive affirmation was at the normal anxiety level of 5 respondents.
4. There was a significant effect of positive affirmation therapy on anxiety in patients with chronic kidney failure who underwent hemodialysis at Dr. Moewardi Surakarta Hospital

ACKNOWLEDGEMENT

Thank you to Dr. Moewardi Surakarta Hospital and the respondents who have supported this research.

REFERENCES

Anggeria, E., & Resmita, M. (2019). The Relationship of Family Support with Anxiety of Chronic Kidney Failure Patients in the Hemodialysis Room of Royal Prima Hospital Medan. *Priority Nursing Journal*, *2*(1), 9–16.

Astuti, V., Fitriyanti, D., & Yono, N. H. (2022). The effectiveness of mindfulness therapy on the anxiety level of patients undergoing hemodialysis. *Karya Kesehatan Siwalima*, *1*(2), 86–93. https://doi.org/10.54639/kks.v1i2.834

Farhani, S. N. (2024). *Dhikr therapy to reduce anxiety levels in hemodialysis patients*. *12*(3), 105–110. https://doi.org/10.22219/procedia.v12i3.32599

Hadriyati, A., Hartesi, B., & Fitri, A. A. (2020). Analysis of Mercury (Hg) in Whitening Creams Circulating at Beauty Clinics in Jelutung District, Jambi City. *Scholar Journal of Pharmacy*, *4*(2), 102–109. https://doi.org/10.31596/cjp.v4i2.79

Harisa, A., Putri, A. A., Rodiah, I., Syarif, I., & Marampa, A. C. (2023). *Increasing the Self-efficacy of Hemodialysis Patients through the Positive Affirmation Program*. *4*(2), 263–270. https://doi.org/10.30812/adma.v4i2.3135

Heriansyah, Aji Humaedi, N. W. (2019). Description of urea and creatinine in patients with chronic kidney failure at Karawang Hospital. *Binawan Student Journal*, *01*(01), 8–14.

Indra Frana Jaya K.K., & Akbar, M. A. (2023). The effect of affirmation techniques on anxiety levels in chronic kidney failure patients undergoing hemodialysis. *Medical Scholars: Journal of Stikes Al-Ma'arif Baturaja*, *8*(2), 257–264. https://doi.org/10.52235/cendekiamedika.v8i2.255

Kamil, I., Agustina, R., & Wahid, A. (2018). An overview of the anxiety level of chronic kidney failure patients undergoing hemodialysis at Ulin Banjarmasin Hospital. *Health Dynamics*, *9*(2), 366–377. https://ojs.dinamikakesehatan.unism.ac.id/index.php/dksm/article/view/350

Kristianti, J., Widani, N. L., & Anggreaini, L. D. (2020). The first experience of undergoing hemodialysis in patients with chronic kidney failure. *Indonesian Scientific Journal of Nursing*, *10*(03), 65–71. https://doi.org/10.33221/jiiki.v10i03.619

Kurniasih, E., Kurnia, A., & Istiqomah, L. F. (2021). The Effect of Spiritual Therapy (Islam) on Reducing Anxiety Levels in Hemodialysis Patients. *Galuh Journal of Nursing*, *3*(1), 15. https://doi.org/10.25157/jkg.v3i1.6584

Kusumastuti, I., Iftayani, I., & Noviyanti, E. (2017). The Effectiveness of Positive Affirmation and Vibration Dhikr Stabilization as a Psychological Therapy Medium to Overcome Anxiety in the Hemodialysis Patient Community. *Journal of Tourism*, *8*(2), 123–131.

Mait, G., Nurmansyah, M., & Bidjuni, H. (2021). Description of physiological and psychological adaptation in chronic kidney failure patients undergoing hemodialysis in Manado City. *Journal of Nursing*, *9*(2), 1. https://doi.org/10.35790/jkp.v9i2.36775

Makmur, S. A., Madania, M., & Rasdianah, N. (2022). Description of drug interactions in patients with chronic kidney failure in the hemodialysis process. *Indonesian Journal of Pharmaceutical Education*, *2*(3), 218–229. https://doi.org/10.37311/ijpe.v2i2.13333

Malinda, H., Sandra, S., & Rasyid, T. A. (2022). The relationship between self-acceptance and self-management undergoing hemodialysis. *Journal of Neuroscience*, *6*, 209–221. https://doi.org/10.31004/jn.v6i2.7699

Manurung, M. (2018). Factors Affecting the Anxiety Level of Hemodialysis Patients at HKBP Balige Hospital, Toba Samosir Regency in 2018. *Journal of Priority Nursing*, *1*(2), 38–50.

Mufidah, N., Aini, D. N., & Prihati, D. R. (2024). The Relationship of Length of Hemodialysis Therapy to Anxiety Levels in CKD Patients Undergoing Hemodialysis. *Journal of Nursing*, *16*(4), 1319–1328.

Natashia, D., Irawati, D., & Hidayat, F. (2020). Fatigue and quality of life in patients with chronic kidney failure with hemodialysis therapy. *Journal of Muhammadiyah Nursing*, *5*(2), 209–218. https://doi.org/10.30651/jkm.v5i2.6540

Nurfatin, G. N., Yonata, A., & Apriliana, E. (2023). Intradialysis Hypotension in Chronic

Kidney Failure Patients. *Medula* |, *13*(3), 327–331. https://scholar.google.com/scholar?hl=id&as_sdt=0%2C5&as_ylo=2019&q=Hipotensi+Intradialitik+pada+Pasien+Gagal+Ginjal+Kronik&btnG=

Orchida, T., Hermawati, & Ratraningsih, S. (2023). Application Of Slow Stroke Back Massage Therapy To Improving The Sleep Quality Of Chronic Kidney Disease (Ckd) Patients Undergoing Hemodialysis At Dr. Moewardi Hospital. *O'Neill*, *1*(4). https://nafatimahpustaka.org/osadhawedyah

Padila, P., Ningrum, D. S., Andri, J., Sartika, A., & Andrianto, M. B. (2021). Parents' Anxiety When Children Interact Social During the Covid-19 Pandemic. *Silampari Journal of Nursing*, *5*(1), 168–177. https://doi.org/10.31539/jks.v5i1.2709

Research, A., Salsabila, C., Akbar, S., Susanti, M., Nasution, H. T., Article, H., Key, K., & Salsabila, C. (2024). *Hemodialysis The Role Of Religiosity In Improving The Quality Of Life Of Hemodialysis Introduction Patients with End Stage Renal Disease (ESRD) undergo Hemodialysis (HD) therapy as a treatment therapy, but this can have an impact on improvement* . *VII(*ii), 53–60.

Putri, P., & Afandi, A. T. (2022). Exploration of Compliance with Hemodialysis in Patients with Chronic Kidney Failure. *Journal of Nursing*, *11*(2), 37–44. https://doi.org/10.47560/kep.v11i2.367

Rustandi, H., Tranado, H., & Pransasti, T. (2018). Factors Affecting the Quality of Life of Chronic Kidney Disease Patients Undergoing Hemodialysis in the Hemodialysis Room. *Silampari Journal of Nursing*, *1*(2), 32–46. https://doi.org/10.31539/jks.v1i2.8

Santoso, D., Sawiji, S., Oktantri, H., & Septiwi, C. (2022). Factors related to fatigue in chronic kidney failure patients undergoing hemodialysis at Dr. Soedirman Kebumen Hospital. *Scientific Journal of Nursing Health*, *18*(1), 60. https://doi.org/10.26753/jikk.v18i1.799

Shabirah, N. N. (2019). Quality of Life of Elderly Clients with Chronic Kidney Failure Who Underwent Hemodialysis Therapy at Haji Surabaya Hospital in 2018. *Journal of Nursing*, *13*(03), 1–5.

Joeli, Y. M., Amu, I. V., & Sune, Z. A. (2021). Stress Level And Hemodialysis Duration Of Patients With Chronic Kidney Failure Undergoing Hemodialysis. *Journal of Aisyah : Journal of Health Sciences*, *6*, 125–131. https://doi.org/10.30604/jika.v6is1.773

Sulviana, E. R., & Kurniasari, L. (2021). The Relationship Between Age, Education, and Employment with the Incidence of Breast Cancer in Women in East Kalimantan. *Borneo Student Research*, *2*(3), 1937–1943. https://journals.umkt.ac.id/index.php/bsr/article/download/1988/951

Sumah, D. F. (2020). Spiritual Intelligence Correlates with Anxiety Levels of Chronic Kidney Failure Patients Undergoing Hemodialysis in the Hemodialysis Room of dr.

Mr. HAULUSSY Ambon. *Journal of Bioscience, 2*(01). https://doi.org/10.52046/biosainstek.v2i01.352s

Wachidah Yuniartika, Febina Fitri Karunia, F. N. (2022). Literature review: the effect of murottal therapy. *Health Journal Research Articles*, *11*(2), 106–112. https://doi.org/10.37048/kesehatan.v11i2.429

Wahida, A. Z., Rumahorbo, H., & Murtiningsih. (2023). The effectiveness of intradialytic exercise in ameliorating fatigue symptoms in patients with chronic kidney failure undergoing hemodialysis: A systematic literature review and meta-analysis. *Journal of Taibah University Medical Sciences*, *18*(3), 512–525. https://doi.org/10.1016/j.jtumed.2022.11.004

Wijaya, F., & Rahayu, D. A. (2019). Positive Affirmation on Coping Mechanism of Chronic Renal Failure Patients. *Journal of Psychiatric Nursing*, *2*(1), 7–12.

Zainiyah, R., Dewi, E. I., & Wantiyah, W. (2018). The Effect of Affirmation Relaxation Techniques on Stress of Students Pursuing Thesis at the University of Jember Nursing Study Program. *Health Library*, *6*(2), 319. https://doi.org/10.19184/pk.v6i2.7781

Original Research/Systematic Review

Effectiveness Of Diabetes Foot Exercises With Brisk Walking Exercise Physical Activity On Reducing Blood Glucose Levels In Type 2 Diabetes Mellitus Patients At Pucangsawit Health Center, Surakarta

Adita Ayu Pratama[1], Athanasia Budi Astuti[2], Dwi Sulistyowati[3]

[1] Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia
[2] Faculty of Nursing, University of Airlangga, Indonesia [3] Unit Medical of Dr Moewardi Hospital, Indonesia

ABSTRACT According to the World Health Organization's 2021 figures, approximately 536 million people worldwide suffer from diabetes. The number of people with diabetes in Southeast Asia is expected to increase to 113 million by 2030 (Khoiry *et al.,* 2023). In Indonesia, diabetes mellitus ranks second among the most common non-communicable diseases, with a prevalence of 10.9% of the population, and 73.7% are unaware of their condition (Khoiry *et al.,* 2023). According to the 2023 Indonesian Health Survey, the prevalence of diabetes mellitus in Central Java reached 118,184 cases. In Surakarta, 12,105 cases of diabetes were detected in 2021.

Background: Diabetes mellitus is a non-communicable disease and a global health crisis with increasing incidence. Efforts to control blood glucose levels in diabetes patients involve pharmacological and non-pharmacological therapies. Non-pharmacological treatments include diabetic foot exercises and brisk walking.
Methods: Quasi-experimental method with static group comparation design. Non-probability technique with purposive sampling of 44 respondents with each group totaling 22 respondents, group A was given diabetes foot exercise intervention and group B was given brisk walking exercise intervention which was carried out over 6 meetings. Paired t test and independent t test analysis techniques.
Results: Diabetic foot exercises and brisk walking exercise can reduce blood sugar levels in type 2 DM patients with a p-value of 0.000 for diabetic foot exercises and a p-value of 0.000 for brisk walking exercise.
Conclusion: *Diabetic foot exercises and brisk running workout can both help lower blood sugar levels. However, there is no difference in effectiveness between diabetic foot exercises and brisk walking in reducing blood glucose levels.*

ARTICLE HISTORY

Received: September 15, 2025

Accepted: September 19, 2025

KEYWORDS

Diabetes Mellitus Type 2 [1], Blood Sugar Levels 2, Diabetes Foot Exercises, Fast Walking Exercises.

CONTACT

Adita Ayu Pratama

aditaayup@gmail.com

Departemen of Nursing Poltekkes Kemenkes Surakarta, Jln Letjen Sutoyo Mojosongo, Surakarta, Indonesia

INTRODUCATION

Diabetes mellitus (DM) is a non-communicable disease and a global health crisis with a rising incidence. Diabetes mellitus is characterized by high blood sugar (blood glucose) levels, which occur due to abnormalities in insulin secretion or insulin function (Soelistijo, A et al., 2021). According to the World Health Organization's 2021 report, approximately 536 million people worldwide suffer from diabetes. The number of DM sufferers in Southeast Asia is estimated to increase to 113 million by 2030 (Khoiry et al., 2023). In Indonesia, diabetes mellitus ranks second among non-communicable diseases, with a prevalence of 10.9% of the population, and 73.7% are unaware of their condition (Khoiry et al., 2023). According to the 2023 Indonesian Health Survey, the prevalence of diabetes mellitus in Central Java reached 118,184 cases. In Surakarta, 12,105 cases of diabetes were detected in 2021. The highest number of sufferers was found in Banjarsari District, with 3,822 cases. Jebres District ranked second for diabetes mellitus with 3,382 cases. Pucangsawit Village had the highest number of cases in Jebres District, with 273 cases.

Efforts to control blood glucose levels in patients with diabetes mellitus involve four pillars: dietary management, blood sugar monitoring, pharmacological therapy, and physical activity. Physical activity is body movement that increases energy expenditure and energy burning. Physical activity can also be achieved through diabetic foot exercises. Diabetic foot exercises aim to improve blood circulation, strengthen leg muscles, and prevent mobility limitations in patients with diabetes mellitus. Diabetic foot exercises are given as an effort to prevent early complications. In addition to diabetic foot exercises, brisk walking can also affect blood glucose levels. Brisk walking is a physical activity that involves walking faster than normal for a predetermined time and distance. Brisk walking for 30-60 minutes, 2-5 times a week, is recommended for patients with type 2 diabetes mellitus (Damanik et al., 2019).

Based on the above issues regarding diabetes mellitus, it is considered important to conduct research on "The effectiveness of diabetic foot exercises with brisk walking physical activity on reducing blood glucose levels in diabetes mellitus patients." The specificity of this study is to determine the effectiveness of diabetic foot exercises with brisk walking physical activity on reducing blood glucose levels in type 2 diabetes mellitus patients.

MATERIALS AND METHODS

This research method is quasi-experimental with a static-group comparison design by dividing the sample into two groups. Group A was given a diabetic foot exercise intervention, while Group B was given a brisk walking exercise intervention. This research was conducted from September 9, 2024, to September 18, 2024. So the sample that will be used in this study is 44 people with type 2 diabetes mellitus who meet the inclusion and exclusion criteria that have been set by the researcher. Respondents will be divided into two groups: group A with a total of 22 respondents and group B with a total of 22 respondents. Each intervention was carried out for 3 weeks. Sampling in this study used purposive sampling.

RESULTS

Table 1. Respondent Characteristics Based on Gender

characteristics	Senam Kaki Diabetes		*Brisk Walking Exercise*	
Gender	**Kuantitas**	**Persen%**	**Kuantitas**	**Persen%**
L	3	13,6	5	9,1
P	19	86,4	17	31,8
Jenis Kelami*Kadar Gula Darah	0,531			0,531
Total	22	100,0	22	100,0

The table above shows that in the diabetic foot exercise group, the majority of the 22 respondents were female, namely 19 respondents (86.4%), and three respondents were male (13.6%). In the brisk walking exercise group, the majority of the 22 respondents were female, namely 17 respondents (31.8%), and five respondents were male (9.1%). The results of the One-Way ANOVA test showed a p-value of 0.531 (>0.05), which means there was no difference in blood glucose levels based on gender.

Table 2. Results of Blood Sugar Level Frequency Before and After Intervention

No	Kadar gula darah	n	Minimum	Maximum	Mean
1.	*Pre-test* diabetic foot exercise	22	140	300	229,14
2.	*Post-test* diabetic foot exercise	22	127	295	221,00
3.	*Pre-test Brisk Walking Exercise*	22	147	308	226,73

Based on the table above, it shows that in the diabetic foot exercise group, the results of the respondents' blood sugar levels before being given the intervention were a minimum value of 140 mg/dl, a maximum value of 300 mg/dl, and a mean value of 229.14. Then the results of the respondents' blood sugar levels after being given the intervention were a minimum value of 127 mg/dl, a maximum value of 295 mg/dl, and a mean value of 221.0 mg/dl. So that diabetic foot exercise can reduce blood sugar levels by a difference of 8.14 mg/dl. In the fast walking exercise group, the results of the respondents' blood sugar levels before being given the intervention were a minimum value of 147 mg/dl, a maximum value of 308 mg/dl, and a mean value of 226.73. Then the results of the respondents' blood sugar levels after being given the intervention were a minimum value of 122 mg/dl, a maximum value of 291 mg/dl, and a mean value of 221.40. So that fast walking exercise can reduce blood sugar levels by 16.32 mg/dl.

Tabel 3 Hasil Uji Normalitas dan Uji Homogenitas *Pre* dan *Post* Kelompok Senam Kaki Diabetes dan *Brisk Walking Exercise*

Uji Normalitas			Uji Homogenitas	
Results	***Shapiro-Wilk***	***Kriteria***	**Mean**	**Kriteria**
Pre-test diabetic foot exercise	0,188.	>0,05	0,245	>0,05
Post-test diabetic foot exercise	0,116	>0,05		

Pre-test Brisk Walking Exercise	0,632	>0,05
Post-test Brisk Walking Exercise	0,540	>0,05

Berdasarkan tabel 4.3 menunjukkan hasil uji normalitas kadar glukosa darah kelompok senam kaki diabetes dan kelompok *brisk walking exercise* dengan uji *shapiro-wilk* > 0,05 maka dapat disimpulkan bahwa data penelitian berdistribusi normal dan berdasarkan hasil uji homogenitas didapatkan nilai > 0,005, maka dapat disimpulkan bahwa varians data *post-test* senam kaki diabetes dan *brisk walking exercise* homogen.

Table 4 Results of Normality Test and Homogeneity Test Pre and Post Diabetic Foot Exercise and Brisk Walking Exercise Groups

Variabel	N	Sig.(2-Tailed)	Kriteria
Pre-test and Post-test diabetic foot exercise	22	0.000	<0,05
Pre-test and *Post-test Brisk Walking Exercise*	22	0.000	<,0,05

Table 4.4 shows that the results of the paired sample t-test data processing obtained a p-value of 0.000 (<0.05), which means that there is a difference in the average results of the diabetic foot exercise group and the brisk running workout group before and after the intervention. Therefore, it is concluded that diabetic foot exercise and brisk running workouts are effective in reducing blood sugar levels.

Tabel 5 Hasil Uji *Independent t-test* Efektivitas Senam Kaki Diabetes dan *Brisk Walking Exercise* Terhadap Penurunan Kadar Glukosa Darah

Variable	n	Sig. (2-tailed)
Post-test diabetic foot exercise group	22	**0,483**
Post-test brisk walking Exercise group	22	**0,483**

Based on Table 4.5, the results of the independent t-test from the diabetic foot exercise group and the fast walking exercise group obtained a p-value of 0.483 (>0.05), meaning that statistically, there is no significant difference in the level of effectiveness between diabetic foot exercise and fast walking exercise in reducing blood glucose levels in type 2 diabetes mellitus patients.

DISCUSSION

In this study, there are four discussions in accordance with the research objectives, the four things are the characteristics of respondents, the effectiveness of diabetes exercise on reducing blood glucose levels, the effectiveness of fast walking exercises on reducing blood glucose levels and the Effectiveness Between Diabetes Foot Exercises and Fast Walking Exercises on Reducing Blood Glucose Levels at the Pucangsawit Surakarta Community Health Center.

Age Characteristics

The results of the study on the diabetic foot exercise and brisk walking groups showed that the average age of respondents was 51-60 years, with a percentage of 50.0% for the diabetic foot exercise and 54.5% for the brisk walking group. This study showed that there was a difference in age between respondents and blood glucose levels, with a p-value of 0.010 (<0.05). These results align with previous

Research by Komariah and Rahayu (2020) revealed a relationship between age and the incidence of type 2 diabetes mellitus (p-value 0.049 (<0.05), and research by Ciarambino et al. (2022) stated that respondents over 40 years of age were at risk of high blood sugar levels.

Gender Characteristics

Based on the results of this study, the diabetic foot exercise group showed that, on average, 19 respondents (86.4%) were female and three respondents (13.6%) were male. In the brisk walking group, on average, 17 respondents (31.8%) were female and five respondents (9.1%) were male. This study showed no difference in blood glucose levels by gender, with a p-value of 0.531 (>0.05). The results of this study are in line with the research of Komariah and Rahayu (2020) which shows that there is no relationship between gender and blood sugar levels, this is also in line with the research conducted by Ciarambino et al., (2022) which proved the results of the analysis that there is no relationship between gender and the incidence of type 2 diabetes mellitus with a p value of 0.432 (> 0.05), but researchers say that women have a greater risk of developing type 2 diabetes mellitus compared to men.

Effectiveness of Diabetic Foot Exercises in Lowering Blood Sugar Levels

The study, using a paired t-test, showed that 22 respondents obtained a p-value of 0.000 (<0.05), indicating that diabetic foot exercises were effective in lowering blood sugar levels. This can be seen in the frequency distribution table, where blood sugar levels before the intervention were 229.14 mg/dl and after the intervention were 221.00 mg/dl. This means that both respondents experienced a decrease in blood sugar levels before and after treatment.

Effectiveness of Brisk Walking Exercises in Reducing Blood Sugar Levels

In this study, analysis using a paired t-test showed that among 22 respondents, the brisk walking exercise resulted in a p-value of 0.000 (<0.05), indicating that brisk walking was effective in lowering blood sugar levels. This can also be seen in the frequency distribution table of blood sugar levels, where before the intervention it was 226.73 mg/dl and after the intervention it was 210.41 mg/dl. This means that both before and after brisk walking exercise, respondents experienced blood sugar levels.

Effectiveness of Diabetic Foot Exercises and Brisk Walking Exercises in Reducing Blood Sugar Levels

This study shows the results of an independent t-test between the diabetic foot exercise group and the brisk walking group, with a p-value of 0.483 (>0.05), indicating that there is no statistically significant difference in effectiveness between diabetic foot exercises and brisk walking exercises in reducing blood glucose levels in patients with type 2 diabetes mellitus.

The benefits of diabetic foot exercises and brisk walking are both effective in reducing blood sugar levels. This is also evident in the Paired Sample T-test table, which obtained a p-value (<0.05), indicating that diabetic foot exercises and brisk walking.

CONCLUSION

Results of a study on the effectiveness of diabetic foot exercises with brisk walking on reducing blood glucose levels in patients with type 2 diabetes mellitus at the Pucangsawit Community Health Center in Surakarta.

1. The characteristics of respondents in this study were that most were aged 51-60 years and female.
2. The diabetic foot exercise group, consisting of 22 respondents, showed a p-value of 0.000 (<0.05) using a paired sample t-test. Therefore, it was concluded that diabetic foot exercises were effective in lowering blood sugar levels.
3. The brisk walking group, consisting of 22 respondents, showed a p-value of 0.000 (<0.05). Therefore, it was concluded that brisk walking was effective in lowering blood sugar levels.
4. Based on the results of the independent t-test between the diabetic foot exercise group and the fast walking exercise group, a p-value of 0.483 (>0.05) was obtained, meaning that statistically, there was no significant difference in the level of effectiveness between diabetic foot exercise and fast walking exercise in reducing blood glucose levels in type 2 diabetes mellitus patients.

ACKNOWLEDGEMENT

Thank you to Health Center Pucangsawit Surakarta and the respondents who have supported this research**.**

REFERENCES

Alza, Y., Arsil, Y., Marlina, Y., Novita, L., & Agustin, N. D. (2020). Aktivitas Fisik, Durasi Penyakit, dan Kadar Gula Darah pada Penderita Diabetes Mellitus (DM) Tipe 2. Jurnal Gizido, 12(1), 18-26.

Ciarambino, T., Crispino, P., Leto, G., Mastrolorenzo, E., Para, O., & Giordano, M.

(2022). Influence of Gender in Diabetes Mellitus and Its Complication. *International Journal of Molecular Sciences*, *23*(16), 1–13. https://doi.org/10.3390/ijms23168850

Hati, Y., & Muchsin, R. (2022). Effect of Brisk Walking on Blood Glucose Levels Patients with Type II Diabetes Mellitus. *Jurnal Ilmu Kesehatan*, *16*(1), 74–79. https://ebsina.or.id/journals/index.php/jkmi/article/view/235/143

Hayati, K., Cahya, N., Manalu, T. A., Agustina, D., & Sembiring, N. E. (2021). Pengaruh Brisk Walking Exercise Terhadap Penurunan Kadar Gula Darah Pada Pasien Dm Tipe 2. *Jurnal Penelitian Keperawatan Medik*, *3*(2), 23–29. https://doi.org/10.37150/jl.v4i2.1444

Komariah, K., & Rahayu, S. (2020). Hubungan Usia, Jenis Kelamin Dan Indeks Massa Tubuh Dengan Kadar Gula Darah Puasa Pada Pasien Diabetes Melitus Tipe 2 Di Klinik Pratama Rawat Jalan Proklamasi, Depok, Jawa Barat. *Jurnal Kesehatan Kusuma Husada*, *Dm*, 41–50. https://doi.org/10.34035/jk.v11i1.412

Rizky Rohmatulloh, V., Riskiyah, Pardjianto, B., & Sekar Kinasih, L. (2024). Hubungan Usia dan Jenis Kelamin Terhadap Angka Kejadian Diabetes Melitus Tipe 2 Berdasarkan 4 Kriteria Diagnosis Di Poliklinik Penyakit Dalam RSUD Karsa Husada Kota Batu. *Jurnal Kesehatan Masyarakat*,

8(1), 2528– 2543. https://journal.universitaspahlawan.ac.id/index.php/prepotif/article/view/27198/19343

Sugiono, M., & Arifianto, A. (2023). Penerapan Senam Kaki Diabetes Pada Pasien Dengan Ketidakstabilan Kadar Glukosa Darah Pada Pasien DM Tipe II di Kota Manyaran Semarang Barat. *Prosding Akademi Keperawatan Widya Husada Semarang*, *5*(1), 116–124. https://prosiding.d3per.uwhs.ac.id/index.php/eproc/article/download/65/51

Original Research

Application of Semi-Fowler Position Intervention to Optimize Oxygenation in Patients with ST-Segment Elevation Myocardial Infarction (STEMI)

Anggela Fitriya Septininsih[1], Tri Sunaryo[2], Sri Mulyanti[3]

[1] Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia
[2] Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia
[3] Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia

ABSTRACT

Background: ST-segment Elevation Myocardial Infarction (STEMI) is a critical emergency of the heart, involving acute occlusion of a coronary artery, resulting in diminished myocardial perfusion and respiratory and systemic functions. Hypoxemia is common in STEMI patients, especially during the subacute phase; this period deserves special attention. The purpose of the present research was to investigate the effect of semi-Fowler's position for improving oxygenation based on an evidence-based nursing approach.
Methods: A STEMI patient who had been hospitalized for dyspnea and reduced oxygen saturation was analyzed in the case. The intervention consisted of semi-Fowler's position for patients on a table (standing next to the bed) in two periods over three consecutive days. Project outcome indicators included SAO2 and respiratory rate before and after each intervention to assess the physiological effect of each.
Results: There was a normalization of respiratory frequency and an improvement in oxygen saturation (> 95%) during semi-Fowler s position. The patient also described improved subjective ease of breathing, which implied that there was improvement in respiratory function.
Conclusion: Patients with subacute STEMI, Semi-Fowler's position is a useful non-invasive and low-cost nursing intervention for oxygenation. The integration of this intervention in the everyday care in cardiovascular units may improve patients' outcomes, avoiding hypoxemia-related complications. Larger studies are suggested to replicate and evaluate the long-term impact of these findings.

ARTICLE HISTORY
Received: September 15, 2025
Accepted: September 19, 2025

KEYORDS
ST-segment elevation myocardial infarction[1], semi-Fowler's position[2], Oxygenation[3], Evidence-Based Nursing[4], Respiratory Care[5].

CONTACT
Anggela Fitriya Septininsih
anggelafitriyaseptininsih@gmail.com
Departemen of Nursing Poltekkes Kemenkes Surakarta, Jln Letjen Sutoyo Mojosongo, Surakarta, Indonesia

INTRODUCTION

Cardiovascular disease is still one of the most common causes of morbidity and mortality globally, and in Indonesia (Suryawan 2023). ST-Segment Elevation Myocardial Infarction (STEMI) is a lethal state of ischemic injury caused by the sudden occlusion of coronary arteries, which causes majorly reduced blood flow to the myocardium with resultant permanent myocardial necrosis when not dealt with swiftly (Hwang and Levis 2024). Ensuring an open airway and maximizing oxygen exchange are important in reducing additional tissue damage and promoting recovery. Seventeen point nine million deaths were due to CVD in 2019 (World Health Organization, (2021), which represented 32% of global deaths, with over three-quarters in low- and middle-income countries. In Indonesia, the number of heart disease cases was reported to reach 877,531 in 2023, with 58.4% occurring in urban populations, and Central Java ranking third nationally after West Java and East Java (Badan Kebijakan Pembangunan Kesehatan, 2023). Local data from the Sukoharjo Health Office documented 302 cases of acute myocardial infarction (AMI) in 2022, consisting of 176 cases in men and 126 in women, further underscoring the urgency of implementing effective STEMI management strategies.

Recent studies highlighted the significant value of non-pharmacological strategies for oxygen support in cardiac patients. Semi-Fowler's position (head of bed elevated to 30°–45°) has been demonstrated to increase lung expansion, facilitate ventilation, and reduce diaphragmatic pressure (Rao *et al*. 2025; Vera 2024). (Prajapati 2024) reported that positioning in semi-Fowler can cause a significant improvement in oxygenation parameters of patients with respiratory distress, while reductions in respiratory rate and an increase in oxygen saturation were observed after they implemented this measure (Amalia *et al.*, (2023). These findings, however, have been based mainly on patients with heart failure or various respiratory diseases, and studies that exclusively included patients with STEMI, especially in the subacute phase, are lacking.

The choice of semi-Fowler's position in this study is based on several clinical and physiological considerations. Although classified as a basic nursing intervention, semi-Fowler's position is still not routinely implemented in post-intensive care settings for STEMI patients, where supine positioning remains common despite its potential to impair diaphragmatic movement and promote hypoventilation. The physiological rationale for semi-Fowler's position is well established: elevating the head and chest to 30°–45° utilizes gravitational forces to lower intra-abdominal pressure, allowing the diaphragm to contract more effectively and increasing tidal volume and vital capacity (Naibaho 2025), This position enhances ventilation of the dependent lung regions, optimizes ventilation-perfusion matching, and improves alveolar gas exchange efficiency (Emfietzoglou 2025). From a hemodynamic perspective, semi-Fowler's position facilitates venous return without causing central venous congestion, reduces preload and afterload by lowering intrathoracic pressure, and thereby decreases myocardial oxygen demand (Armstrong and Moore 2022).

Compared to the supine position, which can exacerbate pulmonary congestion and impair oxygenation, semi-Fowler's position offers superior

respiratory mechanics and hemodynamic stability. Although effective in relieving dyspnea, high-Fowler's position (>60°) may excessively lower preload and compromise cardiac output in hemodynamically unstable patients, making semi-Fowler a safer and more balanced option in the subacute phase of STEMI. These advantages collectively support its selection as a simple, low-cost, and non-invasive intervention that can be readily incorporated into routine nursing care to improve oxygenation and reduce cardiac workload, ultimately contributing to better patient outcomes.

This gap indicates a need for more robust evidence regarding the clinical effectiveness of semi-Fowler's position in STEMI management. This study's novelty lies in its focus on evaluating semi-Fowler's position as an evidence-based, non-invasive intervention to optimize oxygenation in subacute STEMI patients. The results are expected to strengthen clinical recommendations and contribute to improved nursing care protocols in cardiac wards, aiming to reduce complications related to hypoxemia and improve patient outcomes.

MATERIALS AND METHODS

Research Design

This study employed a descriptive case study design aimed at systematically describing the nursing care process for patients diagnosed with ST-Segment Elevation Myocardial Infarction (STEMI). The approach focused on applying semi-Fowler's position as a non-pharmacological intervention to optimize oxygenation. The nursing process involved assessment, nursing diagnosis, care planning, implementation, and evaluation, which were documented comprehensively as part of professional accountability (Kamaruddin *et al.* 2022; Purwanza *et al.* 2022).

Population and Sample

The study population comprised adult patients with a confirmed medical diagnosis of STEMI who were admitted to the inpatient ward. A total of two adult patients were selected as the sample using purposive sampling, considering inclusion and exclusion criteria.

Inclusion Criteria:

1. Patients diagnosed with STEMI confirmed by a physician based on clinical and diagnostic tests.
2. Patients who have or have not received thrombolytic therapy.
3. Age between 30 and 70 years, male or female.
4. Fully conscious (GCS 15), without mental or hearing disorders.
5. No physical mobility limitations (no paralysis or fractures).
6. Receiving oxygen therapy via nasal cannula.
7. No severe complications such as cardiogenic shock, acute respiratory failure, or comorbid respiratory disorders (e.g., severe COPD, acute asthma exacerbation).

Exclusion Criteria:

1. Patients who withdraw during the intervention process.
2. Patients who do not complete all sessions of intervention.
3. Patients whose health status deteriorates during the study.

Study Setting and Period

The case study was conducted in the Inpatient Ward, specifically in the Lavender Ward of RSUD Ir. Soekarno Sukoharjo, Indonesia, during June 2025.

Materials and Equipment

The main equipment used included a pulse oximeter (for SpO_2 monitoring). Supporting equipment included a semi-Fowler adjustable hospital bed and oxygen delivery system (nasal cannula).

Data Collection Procedure

Patients were placed in a semi-Fowler's position (30–45° head elevation) twice daily for three consecutive days. Oxygen saturation (SpO_2) and respiratory rate were measured before and after each intervention session using standardized equipment. The nursing process followed the evidence-based practice nursing (EBPN) approach, emphasizing objective measurement and documentation of clinical changes.

Intervention Procedure (Semi-Fowler's Position SOP)

The procedure was carried out according to the Standard Operating Procedure (SOP) recommended by PPNI (2021)consisting of four main stages:

1. **Pre-Interaction Stage:** Perform 6-step handwashing and prepare equipment.
2. **Orientation Stage:** Greet patient, introduce self, verify patient identity, explain procedure, confirm readiness, provide opportunity for questions, and ensure privacy.
3. **Working Stage:** Wash hands, use gloves if needed, assess patient's physical tolerance, measure vital signs, adjust bed angle to 30°–45°, place pillow under head/neck, ensure patient comfort.
4. **Termination Stage:** Arrange equipment and bed, remove gloves, wash hands, perform therapeutic communication, evaluate patient comfort, provide reinforcement, inform next plan, and close with appropriate farewell.

Data Analysis

Collected data were analyzed descriptively, focusing on changes in oxygen saturation, respiratory rate, and patient comfort during the intervention period. Results were presented in narrative and tabular form to illustrate physiological improvement and support clinical decision-making. Literature review using PICOT framework was conducted to validate the intervention against recent evidence-based guidelines.

Ethical Considerations

This study received ethical approval from the **Health Research Ethics Committee of Poltekkes Kemenkes Semarang** (No. 810/EA/F.XXIII.38/2025). Ethical clearance was granted in accordance with WHO (2011) standards, including Social Value, Scientific Value, Risk-Benefit Assessment, Prevention of Exploitation, Confidentiality and Privacy, and Informed Consent, referring to CIOMS 2016 guidelines. The approval is valid from June 2, 2025, to June 2, 2026, signed by Prof. Dr. Runjati, Bdn., M.Mid.

RESULTS

This study involved two adult patients diagnosed with ST-Segment Elevation Myocardial Infarction (STEMI) who received semi-Fowler's position intervention twice daily for three consecutive days. The results are presented according to the research objectives, focusing on oxygenation status, respiratory pattern, and patient comfort.

Patient Characteristics

Both patients met the inclusion criteria, were fully conscious, and received oxygen therapy via nasal cannula. Baseline characteristics are summarized in **Table 1**.

Table 1. Baseline Characteristics of Patients

Parameter	Case 1 (Tn. P)	Case 2 (Ny. P)
Age (years)	47	68
Gender	Male	Female
Blood Pressure (mmHg)	137/84	149/87
Heart Rate (x/min)	74	93
Respiratory Rate (x/min)	26	27
SpO_2 (%) (with O_2)	96 (4lpm)	94 (5lpm)
GCS	15	15
Body Mass Index (kg/m²)	23.4	22.8

Summary of Nursing Care

Nursing diagnoses, interventions, implementation, and outcomes for both patients are systematically summarized in **Table 2** and **Table 3** based on the Indonesian Nursing Standards (SDKI, SIKI, SLKI).

Table 2. Summary of Nursing Care for Case 1 (Tn. P)

Nursing Diagnosis (SDKI)	Interventions (SIKI)	Implementation (Frequency/Duration)	Outcomes (SLKI)
Ineffective Breathing Pattern	Airway Management, Semi-Fowler Position	over a period of three days 2×/day for 3 days (Semi-Fowler Position)	Respiratory rate returned to normal, no accessory muscle use, SpO_2 stable
Risk of Decreased Cardiac Outpu	Cardiac Care	over a period of three days	Heart rate and blood pressure stable, good peripheral perfusion
Activity Intolerance	Energy Management	over a period of three days	Decreased dyspnea and fatigue after light activity

Table 3. Summary of Nursing Care for Case 2 (Ny. P)

Nursing Diagnosis (SDKI)	Interventions (SIKI)	Implementation (Frequency/Duration)	Outcomes (SLKI)
Ineffective Breathing Pattern	Airway Management, Semi-Fowler Position	over a period of three days 2×/day for 3 days (Semi-Fowler Position)	Respiratory rate within normal limits, no accessory muscle use, SpO_2 stable

Risk of Decreased Cardiac Outpu	Cardiac Care	over a period of three days	Heart rate and blood pressure are stable, and there is good peripheral perfusion
Acute Pain	Pain Management	over a period of three days	Decreased pain intensity (from scale 7 to 3–4)
Activity Intolerance	Energy Management	over a period of three days	Increased activity tolerance, reduced dyspnea after mild activity

Oxygenation and Respiratory Pattern Outcome

After three consecutive days of intervention, both patients demonstrated improved respiratory function. Changes in respiratory rate and oxygen saturation are shown in **Table 4**

Table 4. Oxygenation and Respiratory Rate Before and After Intervention

Parameter	Case 1- Pre	Case 1 - Post	Case 2 - Pre	Case 2 - Post
Respiratory Rate (x/min)	26	20	27	21
SpO_2 (%)	96	98	94	97

The intervention resulted in decreased respiratory rate to within normal limits (20–21×/minute), increased oxygen saturation (>97%), and absence of accessory muscle use in both patients (Table 4).

DISCUSSION

This study investigated the effect of semi-Fowler position intervention on oxygenation in patients with ST-Segment Elevation Myocardial Infarction (STEMI). The findings showed a consistent improvement in respiratory rate, decreased dyspnea, and increased peripheral oxygen saturation (SpO_2) after the intervention. These results suggest that semi-Fowler positioning provides significant clinical benefits for patients experiencing impaired oxygenation due to myocardial ischemia.

Physiologically, myocardial infarction leads to impaired left ventricular contractility, increased pulmonary capillary pressure, and reduced oxygen delivery to tissues. This condition often manifests as tachypnea, dyspnea, and hypoxemia, which increase myocardial workload and may worsen ischemia. The semi-Fowler position helps reduce venous return and preload, thereby decreasing pulmonary congestion and facilitating diaphragmatic excursion. These mechanisms improve ventilation-perfusion matching, optimize oxygenation, and reduce the work of breathing (Amalia *et al*. 2023).

The patient responses observed in this study provide further evidence of these physiological benefits. On the first day, both Tn. P and Ny. P still exhibited elevated respiratory rates and use of accessory muscles. Tn. P, with RR 26×/minute, reported decreased dyspnea after 15 minutes of semi-Fowler positioning, accompanied by RR reduction to 22×/minute and improved comfort. Ny. P showed a slower response; at the beginning of day one, RR remained

27×/minute with nasal flaring, but after positioning and oxygen therapy, SpO_2 increased from 94% to 96%, and the patient appeared more relaxed.

On the second day, the effects of semi-Fowler positioning became more consistent. Tn. P no longer exhibited significant accessory muscle use, and RR stabilized at 20–21×/minute post-intervention. Chest pain was also reduced, likely due to decreased cardiac workload. Ny. P showed an improved breathing pattern with reduced nasal flaring, although RR was still slightly above normal.

By the third day, both patients maintained SpO_2 >96% with the same or reduced oxygen requirement compared to the previous days. Tn. P reported easier breathing even during conversation, while Ny. P stated that chest pain had significantly diminished. These findings demonstrate that repeated semi-Fowler positioning effectively enhances alveolar ventilation, reduces work of breathing, and stabilizes hemodynamics (Amalia *et al*. 2023; Naibaho 2025)

The results of this study align with Naibaho (2025), who reported that elevating the head of the bed by 30–45° significantly increases oxygen saturation and patient comfort in acute coronary syndrome. Likewise, within 48 hours following intervention, the semi-Fowler position enhanced SpO2 and hemodynamic parameters, per Putri and Listiyanawati (2020) Improved oxygenation was observed in this trial for three days in a row. This highlights the significance of having recurrent and consistent nursing care and supports earlier findings.

The semi-Fowler posture offers a number of benefits from the standpoint of nursing practice. It is easy to use, non-invasive, economical, and suitable for a variety of environments, including emergency rooms, general wards, and critical care units. This solution can be used even in healthcare facilities with minimal resources because it doesn't require specialized equipment. Moreover, it aligns with standardized nursing diagnoses (Tim Pokja SDKI DPP PPNI 2017) such as “Ineffective Breathing Pattern” and targeted outcomes (Tim Pokja SLKI DPP PPNI 2018)for improved oxygenation, supporting the application of evidence-based practice.

Optimizing treatment outcomes also heavily relies on patient education. Reducing anxiety, promoting commitment to the treatment plan, and increasing patient engagement can all be achieved by explaining the semi-Fowler stance. Collaborative management with physicians and physiotherapists can combine positioning with breathing exercises and gradual mobilization, further enhancing recovery.

Although the results are promising, there are some limitations to this study. The generalisable results are limited by the small sample size (n=2). In addition, the short observation period (three days) does not include long-term results such as the prevention of pulmonary oedema, reduction in length of hospital stay, or improvement in functional capacity after patient discharge. To confirm these results and investigate their impact on morbidity, mortality, and readmission rates, controlled randomised trials with larger samples and longer follow-up periods are recommended.

The semi-Fowler posture is a crucial nursing intervention for STEMI patients experiencing dyspnea or low SpO2, according to this study. By integrating this

technique into hospital protocols and early cardiac rehabilitation programs, hypoxemia problems can be avoided, oxygenation can be improved, and patient comfort can be increased. Nurses need to be taught how to use the right techniques and keep an eye on patients' reactions in order to maximize therapeutic results.

CONCLUSION

The semi-Fowler posture is a successful evidence-based nursing intervention for improving oxygenation in patients with ST-segment elevation myocardial infarction (STEMI), according to this study. Both patients, whether or not they received thrombolytic therapy, had significant improvements in respiratory rate, decreased use of auxiliary breathing muscles, enhanced lung expansion, and improved oxygen saturation after using this intervention twice daily for three days in a row. These findings provide credence to the semi-Fowler position's therapeutic applicability as an easy, non-invasive, and reasonably priced way to lower respiratory effort, stabilize hemodynamics, and improve patient comfort.

These findings ought to motivate nursing schools to enhance their students' comprehension of evidence-based treatments for oxygenation issues in STEMI patients, especially the semi-Fowler position. It is advised that medical facilities include the semi-Fowler position in standard nursing procedures and clinical practice guidelines. In order to encourage family involvement in care and avoid issues at home, the public should also be better informed about the proper body posture for patients with cardiovascular disease. The semi-Fowler position's long-term consequences on cardiorespiratory outcomes in STEMI patients require more investigation. The ideal frequency and duration of this intervention in different clinical circumstances also require investigation.

ACKNOWLEDGEMENT

The authors would like to thank RSUD Ir. Soekarno Sukoharjo for granting permission for this study. We also like to express our gratitude to the Lavender ward's head and nurses for helping and supporting the researchers throughout the intervention and data collection. The authors are also deeply grateful to the patients who voluntarily participated and contributed to the advancement of evidence-based nursing practice.

REFERENCES

Amalia, Rosyta, Nur Rahmawati, Ika Silvitasari, and Sumardi. 2023. “Penerapan Pemberian Posisi Semi Fowler Dalam Meningkatkan Saturasi Oksigen Dan Menurunkan Respiration Rate Pasien Stemi RSUD Dr. Soediran Mangun Sumarso Wonogiri.” *Jurnal Ilmu Kesehatan Mandira Cendikia* 2(9):80–93.

Armstrong, Maggie, and Ross A. Moore. 2022. “Anatomy, Patient Positioning.” *National Library of Madicine Madicine*.

Badan Kebijakan Pembangunan Kesehatan. 2023. “Survei Kesehatan Indonesia

(SKI) Dalam Angka." 1–68.

Emfietzoglou, Maria. 2025. "Semi-Fowler Position; What Is It, Difference from Fowler, and More." Retrieved (https://www.osmosis.org/answers/semi-fowler-position).

Hwang, Calvin, and Joel T. Levis. 2024. "ECG Diagnosis: ST-Elevation Myocardial Infarction." *National Library of Medicine*. Retrieved (https://pmc.ncbi.nlm.nih.gov/articles/PMC4022571/?

Kamaruddin, Ilham, Titik Juwariah, Tuti Susilowati, Mardiana, Suprapto, Hastuti Marlina, Siti Maisyaroh Bakti Pertiwi, Meti Agustini, Agus Supriyadi, Andi Pramesti Ningsih, and Maryani Setyowati. 2022. *Metodologi Penelitian Kesehatan Masyarakat*. Vol. 3. Pertama. edited by M. Sari and R. M. Sahara. Padang, Sumatera Barat: PT Global Eksekutif Teknologi.

Naibaho, Risdiana Melinda. 2025. *Buku Ajar Praktik Kebutuhan Manusia Dalam Konteks Keperawatan*. Media Pustaka Indo.

PPNI, Tim Pokja Pedoman SPO Keperawatan DPP. 2021. *Pedoman Standar Operasional Prosedur Keperawatan*. Jakarta Selatan: Dewan Pengurus Pusat Persatuan Perawat Nasional Indonesia.

PPNI, Tim Pokjo SDKI DPP. 2017. *Standar Diagnosis Keperawatan Indonesia:Definisi Dan Indikator Diagnostik*. 1 Cetakan. Jakarta: PPNI.

Prajapati, Archna. 2024. "Assessing the Effectiveness of Lateral and Semi Fowler's Position on Selected Patients Admitted with Respiratory Problems in Different Hospitals." *Nursing & Healthcare International Journal* 8(1). doi: 10.23880/nhij-16000301.

Purwanza, Sena Wahyu, Aditya Wardhana, Ainul Mufidah, Yuniarti Reny Renggo, Adrianus Kabubu Hudang, Jan Setiawan, Darwin, Atik Badi'ah, Siskha Putri Sayekti, Maya Fadlilah, Rambu Luba Kata Respati Nugrohowardhani, Amruddin, Gazi Saloom, Tati Hardiyani, Santalia Banne Tondok, Retno Dewi Prisusanti, and Rasinus. 2022. *Metodologi Penelitian Kuantitatif, Kualitatif Dan Kombinasi*. edited by A. Munandar. Bandung: Penerbit Media Sains Indonesia.

Putri, Anggita Dwi Ramadhany, and Mutiara Dewi Listiyanawati. 2020. "Asuhan Keperawatan Pasien St-Elevasi Miokard Infark (STEMI) Dalam Pemenuhan Kebutuhan Oksigenasi." *Fakultas Ilmu Kesehatan Universitas Kusuma Husada*.

Rao, Sunil V, Michelle L. O'Donoghue, Marc Ruel, Tanveer Rab, Jaqueline E. Tamis-Holland, John H. Alexander, Usman Baber, Heather Baker, Mauricio G. Cohen, Mercedes Cruz-Ruiz, Leslie L. Davis, James A. de Lemos, Tracy A. DeWald, Islam Y. Elgendy, Dmitriy N. Feldman, Abhinav Goyal, Ijeoma Isiadinso, Venu Menon, David A. Morrow, Debabrata Mukherjee, Elke Platz, Susan B. Promes, Sigrid Sandner, Yader Sandoval, Rachel Schunder, Binita Shah, Jason P. Stopyra, Amy W. Talbot, Pam R. Taub, and Marlene S. Williams. 2025. *2025 ACC/AHA/ACEP/NAEMSP/SCAI Guideline for the Management of Patients With Acute Coronary Syndromes: A Report of the American College of Cardiology/American Heart Association Joint*

Committee on Clinical Practice Guidelines.

Suryawan, I. Gde Rurus. 2023. *Buku Ajar Sindrom Koroner Akut*. 1st ed. edited by Andrianto. Airlangga University Press.

Tim Pokja SDKI DPP PPNI. 2017. *Standar Diagnosis Keperawatan Indonesia: Definisi Dan Indikator Diagnostik*. 1st ed. Jakarta: Dewan Pengurus Pusat PPNI.

Tim Pokja SLKI DPP PPNI. 2018. *Standar Luaran Keperawatan Indonesia: Definisi Dan Kriteria Hasil Keperawatan*. 1st ed. Jakarta: Dewan Pengurus Pusat PPNI.

Vera, Matt. 2024. "Patient Positioning: Complete Guide and Cheat Sheet for Nurses."

World Health Organization (WHO). 2021. "Cardiovascular Diseases (CVDs)."

Original Research

Content Validity of a Knowledge, Attitude, and Skill Instrument for Cardiopulmonary Resuscitation (CPR) and Sudden Cardiac Arrest First Aid

Addi Mardi Harnanto[1], Hartono Hartono[2], Eny Lestari[3], & Sri Mulyani[4]
[1] University Sebelas Maret, Surakarta, Indonesia, Indonesia
[2] University Sebelas Maret, Surakarta, Indonesia, Indonesia
[3] University Sebelas Maret, Surakarta, Indonesia, Indonesia
[4] University Sebelas Maret, Surakarta, Indonesia, Indonesia

ABSTRACT

Background: Cardiovascular diseases, including heart attacks and cardiac arrest, remain the leading cause of non-communicable disease mortality globally. Out-of-Hospital Cardiac Arrest (OHCA) survival rates are significantly low, often due to inadequate or delayed first aid administered by lay rescuers. In Indonesia, while specific community-level data is lacking, the high prevalence of cardiovascular disease suggests a significant incidence of cardiac arrest. Therefore, developing a high-quality measurement tool is essential to study the Knowledge, Attitude, and Skills (KAS) in first aid for heart attack and cardiac arrest among community members with affected family members.
Purpose: This study aimed to confirm the Content Validity of three newly developed instruments including knowledge, attitude and Skills intended to measure the KAS required for providing first aid in cases of Cardiopulmonary Resuscitation (CPR) and Sudden Cardiac Arrest.
Methods: The Content Validity test was performed using the Expert Judgment method, involving a specialized panel of seven (7) expert lecturers primarily specializing in Emergency Nursing and Educational Management. Experts evaluated each item for relevance and linguistic clarity against established criteria. The quantitative data were analyzed using the Content Validity Index (CVI) method. Experts must meet strict criteria, including holding a minimum S2/Master's degree and having at least 5 years of relevant clinical/academic experience.
Result: The quantitative analysis established that all three instruments possess Very High Content Validity. The Scale-Level CVI (S-CVI/Ave) for all instruments significantly exceeded the critical threshold of 0.90: Knowledge (0.95), Attitude (0.94), and Skills (0.96). The Item-Level CVI (I-CVI) demonstrated strong consensus, with 93.3% of Knowledge items and 90% of Attitude items achieving a perfect I-CVI of 1.00. The lowest I-CVI score recorded across all scales was 0.86, substantially higher than the acceptable minimum of 0.78.
Summary: Based on the consistent and compelling quantitative and qualitative data from the expert panel, all three developed instruments are collectively declared Highly Valid for measuring KAS in CPR and Sudden Cardiac Arrest First Aid. They are therefore deemed suitable for immediate advancement to the subsequent research phase, which involves comprehensive field testing to establish reliability and further validity assessments (Construct Validity and Objective Structured Clinical Examination validation).

ARTICLE HISTORY
Received: September 15, 2025
Accepted: September 19, 2025

KEYORDS
Content Validity[1], Knowledge[2], Attitude[3], Skills [4], Cardiopulmonary resuscitation (CPR)[5], Sudden cardiac arrest first aid[6].

CONTACT
Addi Mardi Harnanto

addimharnanto@gmail.com
Departemen of Nursing Poltekkes Kemenkes Surakarta, Jln Letjen Sutoyo Mojosongo, Surakarta, Indonesia

INTRODUCTION

Cardiovascular diseases (including coronary heart disease and stroke) are the most common non-communicable diseases in the world, causing approximately 17.8 million deaths in 2017, with more than three-quarters of these occurring in low- and middle-income countries (Roth et al., 2018). A heart attack is caused by a blockage that stops blood flow to the heart. A heart attack refers to the death of heart muscle tissue due to the loss of blood supply, which leads to serious and sometimes fatal health problems. A heart attack can progress to cardiac arrest. Meanwhile, cardiac arrest is the sudden and abrupt loss of heart function; it can occur in a person previously diagnosed with heart disease or in those without. The time of its occurrence is unpredictable and happens very quickly once symptoms and signs (American Heart Association, 2021).

In 2015, approximately 350,000 adult individuals in the United States experienced non-traumatic Out-of-Hospital Cardiac Arrest (OHCA) and were treated by Emergency Medical Services (EMS) personnel. Less than 40% of these adults received Cardiopulmonary Resuscitation (CPR) administered by lay rescuers, and fewer than 12% received assistance from an automated external defibrillator (AED) before the arrival of EMS (American Heart Association, 2020). In Indonesia, there is no certain data related to the incidence of heart attack and cardiac arrest that occurs within the community (OHCA). The biggest cause of cardiac arrest is cardiovascular disease (70%). If there are more than 5 million people with cardiovascular disease in Indonesia, then the number of cardiac arrest sufferers is considered quite high (Darmawan et al., 2021). Developed nations have successfully implemented Community First Responders (CFRs) to provide vital public first aid, though growth is still sought. Evidence from the UK highlights that CFRs are increasingly contributing to emergency services, finding their role rewarding, and are motivated to maintain their core skills while seeking ongoing professional development (Phung et al., 2018).

Study examining the knowledge, attitude, and skills in first aid for heart attack and cardiac arrest among community members who have family members with heart disease is very important. In the field of study, researchers initially

formulate a conceptual model containing specific variables related to the problem or topic under investigation. This model is subsequently tested by collecting and analyzing survey data gathered via a questionnaire. Given that most empirical studies follow this pattern, the quality of the findings relies heavily on the quality of the measurement tool. Therefore, the essential first attribute that any survey instrument must possess is validity (Lütfi SÜRÜCÜ, 2020).

Method

The Expert Validity (or Content Validity) test is performed to confirm that the instrument developed provides a comprehensive and representative measure of the intended variable domains—specifically, the Knowledge, Attitude, and Skills (KAS) essential for providing first aid in cases of heart attack and cardiac arrest. The primary objective of this validation process is to secure an objective assessment from subject matter experts concerning the relevance, clarity, appropriateness of language, and overall completeness of the instrument's items (Lawshe, 1975). Number of Experts is a minimum of 7 experts. Expert Criteria criteria includes possess a minimum educational background of S2/Master's degree in Emergency Nursing, Cardiovascular Nursing, or Health Education, have a minimum of 5 years of clinical or academic experience in the field of emergency care or resuscitation (CPR/ALS), have in-depth understanding of research instrument development, specifically knowledge and attitude scales, and skills *checklists*.

Each expert received a comprehensive validation package. This package included the theoretical framework, the draft instrument, the operational definitions for the Knowledge, Attitude, and Skills (KAS) variables related to heart attack and cardiac arrest first aid, and an expert judgment form. The researcher provided a brief explanation of the study objectives and the instrument's design. Experts were then required to evaluate every item based on its relevance (suitability to the measurement goal) and linguistic clarity. Furthermore, experts offered qualitative input (notes and suggestions) for any items they deemed inaccurate or ambiguous.

The resulting quantitative assessments from the experts were subsequently analyzed statistically to ascertain the level of consensus or item relevance.

RESULTS & DISCUSSION

Quesionair of Knowledge

Table 1. Content Validity of Knowledge Questionare

Validity matric	Obtained CVI Value	Interpretation
I-CVI	Mean I_CVI=0,97	Indicates a very strong average expert consensus at the individual item level
S-CVI/Ave	S-CVI/Ave = 0.95	Exceeds the recommended critical threshold (≥0.90), signifying very strong overall content validity for the entire instrument.

The Content Validity assessment was executed via Expert Judgment, utilizing a panel of seven (7) highly proficient experts specializing in Nursing Emergency and Educational Management. This validation aimed to confirm that the thirty (30) items constituting the knowledge instrument comprehensively and accurately cover the target domain. The experts evaluated each item based on its relevance and linguistic clarity. Quantitatively, the Content Validity Index (CVI) analysis established that the instrument demonstrated Very High content validity. Specifically, twenty-eight items (93.3%) attained an Item-Level CVI (I-CVI) of 1.00, indicating perfect consensus among all seven experts regarding their high relevance and clarity. The two remaining items (6.7%) achieved a minimum I-CVI of 0.86, substantially exceeding the conventional acceptance threshold (generally ≥ 0.78). Based on the analysis, the 30-item knowledge instrument is collectively declared Highly Valid. The high CVI scores confirm a robust consensus among the expert panel, signifying that the questions are relevant, clear, and sufficient to accurately measure the construct of Cardiopulmonary Resuscitation (CPR) and Sudden Cardiac Arrest First Aid knowledge. Consequently, the instrument is deemed suitable for advancement to the field-testing phase, including reliability and construct validity assessments.

Quesionair of Attitude

Table 2. Content Validity of Attitute Questionare

Validity matric	Obtained CVI Value	Interpretation
I-CVI	Mean I_CVI=0,96	Indicates a very strong average expert consensus at the individual item level
S-CVI/Ave	S-CVI/Ave = 0.94	Exceeds the recommended critical threshold (≥0.90), signifying very strong overall content validity for the entire instrument.

The Content Validity of the instrument was assessed through Expert Judgment, utilizing a specialized panel of seven (7) validators who hold dual expertise as lecturers in Emergency Nursing and Educational Management. The primary objective was to ensure the 20-item attitude instrument comprehensively and accurately measured the intended construct. Experts evaluated each item for its relevance and linguistic clarity. The quantitative analysis using the Content Validity Index (CVI) method confirmed the instrument possessed Very High content validity. Specifically, 27 items (90%) achieved an I-CVI of 1.00, demonstrating unanimous consensus among all seven experts regarding their high relevance and clarity. The remaining three items (10%) secured a minimum I-CVI of 0.86, substantially exceeding the standard acceptance threshold (generally ≥0.78). Consequently, based on these robust results, the 30-item attitude instrument is declared Highly Valid. The exceptional CVI scores affirm a strong expert consensus that the questions are relevant, unambiguous, and adequate for measuring the construct of attitude towards Cardiopulmonary Resuscitation (CPR) and Sudden Cardiac Arrest First Aid. The instrument is therefore deemed suitable for deployment in subsequent field testing (reliability and construct validity).

Instrument of Skills

Table 3. Content Validity of Attitute Questionare

Validity matric	Obtained CVI Value	Interpretation
I-CVI	Mean I_CVI=0,98	Indicates a very strong average expert consensus at the individual item level
S-CVI/Ave	S-CVI/Ave = 0.96	Exceeds the recommended critical threshold (≥0.90), signifying very strong overall content validity for the entire instrument.

The Content Validity of the skills instrument was established through Expert Judgment, utilizing a panel of seven (7) highly qualified expert validators specializing in Emergency Nursing. The core goal of this testing was to ensure the instrument, composed of 8 items, comprehensively and accurately measured the target skills domain. Experts evaluated the relevance, clarity, and completeness of every skill item or procedural step. The subsequent quantitative analysis, employing the Content Validity Index (CVI) method, confirmed the instrument possessed Very High content validity. Based on these robust findings, the skills instrument is collectively declared Highly Valid. The exceptional CVI values underscore the strong consensus among the Emergency Nursing lecturers that the steps are relevant, unambiguous, and adequate to accurately assess the practical skills construct. Consequently, the instrument is deemed suitable for deployment in the subsequent field testing phase (reliability and objective structured clinical examination validation).

CONCLUSION

Drawing upon the consistent and compelling quantitative and qualitative data provided by the expert panel, all three developed instruments are collectively determined to be Highly Valid. Consequently, they are deemed appropriate for immediate advancement to the subsequent research phase, which entails comprehensive field testing to establish reliability and further validity

assessments (specifically Construct Validity for the questionnaires and checklist for the Skills instrument).

REFERENCES

American Heart Association. (2020). *Highlights of the 2020 American Heart Association Guidelines For CPR and ECC*.

American Heart Association. (2021). *About Cardiac Arrest*. https://www.heart.org/en/health-topics/cardiac-arrest/about-cardiac-arrest

Darmawan, R. E., Sujianto, U., & Rochana, N. (2021). Implementation of Chest Compression for Cardiac Arrest Patient in Indonesia : True or False. *Jurnal Ners*, *16*(1), 2014–2017.

Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology*, *28*(4), 563–575. https://doi.org/https://doi.org/10.1111/j.1744-6570.1975.tb01393.x

Lütfi SÜRÜCÜ, A. M. (2020). *BUSINESS & MANAGEMENT STUDIES : 3*, 2694–2726.

Phung, V. H., Trueman, I., Togher, F., Ørner, R., & Siriwardena, A. N. (2018). Perceptions and experiences of community first responders on their role and relationships: Qualitative interview study. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, *26*(1), 1–10. https://doi.org/10.1186/s13049-018-0482-5

Roth, G. A., Abate, D., Abate, K. H., Abay, S. M., Abbafati, C., Abbasi, N., Abbastabar, H., Abd-Allah, F., Abdela, J., Abdelalim, A., Abdollahpour, I., Abdulkader, R. S., Abebe, H. T., Abebe, M., Abebe, Z., Abejie, A. N., Abera, S. F., Abil, O. Z., Abraha, H. N., … Murray, C. J. L. (2018). Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, *392*(10159), 1736–1788. https://doi.org/10.1016/S0140-6736(18)32203-7