

The Relationship Between Nurses' Knowledge Level and the Timeliness of Emergency Management in Emergency Patients

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ABSTRACT

Background: Timely emergency management is essential for preventing complications, disability, and mortality among emergency patients. Nurses' knowledge influences their ability to assess patients, determine triage priorities, recognize life-threatening conditions, and provide appropriate interventions without delay.

Research Objective: This study aimed to determine the relationship between nurses' knowledge level and the timeliness of emergency management at the Emergency Department of Sinjai Regional General Hospital.

Methods: This quantitative study employed an analytical observational design with a cross-sectional approach. The study was conducted in 2024 and involved all 21 nurses working in the Emergency Department, selected using total sampling. Data were collected using a structured knowledge questionnaire and an emergency-management timeliness observation sheet. Univariate analysis was performed using frequencies and percentages, while bivariate analysis used Fisher's exact test with a significance level of 0.05.

Results: Of the 21 nurses, 11 (52.4%) had good knowledge, six (28.6%) had moderate knowledge, and four (19.0%) had poor knowledge. Fourteen nurses (66.7%) provided timely emergency management, while seven (33.3%) did not. Fisher's exact test showed a significant relationship between nurses' knowledge and management timeliness ($p = 0.024$).

Conclusion: Nurses with good knowledge were more likely to provide timely emergency management. Continuous training, clinical simulation, competency evaluation, and response-time monitoring are recommended to improve emergency care quality and patient safety.

Keywords: Emergency Management; Nurses' Knowledge; Response Time



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BACKGROUND

Emergency departments represent the frontline of hospital services and are responsible for providing immediate assessment, stabilization, and life-saving interventions to patients experiencing acute illness or injury (Zeng et al., 2024). Emergency conditions such as cardiac arrest, stroke, severe trauma, respiratory failure, shock, poisoning, and obstetric complications can deteriorate within minutes; therefore, delays in identifying and managing these conditions may increase the risk of disability, complications, prolonged hospitalization, and death (Sriraman et al., 2023). The timeliness of emergency management is consequently an essential indicator of service quality and patient safety. Nurses have a central role in this process because they are generally the first healthcare professionals to receive patients, conduct initial assessments, determine triage priorities, monitor physiological changes, and initiate nursing interventions (Ivziku et al., 2024). Their ability to respond appropriately depends not only on the availability of facilities and personnel but also on their knowledge of triage, basic and advanced life support, clinical signs of deterioration, standard operating procedures, and the principles of emergency nursing (Hasan et al., 2024).

At the global level, emergency care has become an important component of universal health coverage because it addresses a broad spectrum of time-sensitive conditions resulting from injuries, communicable diseases, noncommunicable diseases, and pregnancy-related complications (Ibrahim et al., 2024). The World Health Organization emphasizes that an integrated emergency and critical care system is necessary to ensure that acutely ill and injured patients receive safe, effective, and timely services. The Seventy-sixth World Health Assembly also called for greater prioritization of integrated emergency, critical, and operative care as part of universal health coverage and health emergency preparedness (Rixon et al., 2024). However, emergency care systems in many low- and middle-income countries continue to face limited human resources, inadequate training, overcrowding, insufficient equipment, and inconsistent implementation of triage protocols. These challenges can delay clinical decision-making and emergency interventions. In this context, nurses' knowledge is a critical professional resource because adequate knowledge enables rapid recognition of life-threatening conditions, accurate prioritization, and the selection of appropriate interventions within the limited time available (Indarwati et al., 2023).

In Indonesia, emergency departments are required to provide continuous services and ensure that patients are managed according to their level of urgency. National emergency-care guidance places particular emphasis on rapid assessment, appropriate triage, competent personnel, service readiness, and coordination among healthcare professionals (Kurnio et al., 2021). The Indonesian Ministry of Health describes emergency response time as an important measurement of service effectiveness, with priority-one patients requiring an initial response within approximately zero to five minutes (Ward et al., 2024). Nevertheless, compliance with the expected response time remains uneven across hospitals. A recent scoping review reported that the average proportion of rapid responses among emergency nurses in Indonesian hospitals was approximately 66.24%, indicating that a substantial proportion of emergency services may not yet achieve optimal timeliness. The review also identified education, training, workload, work experience, patient acuity, and healthcare infrastructure as factors that may influence nurses' response times (Saharman et al., 2021). These findings demonstrate that improving emergency response requires attention to both organizational conditions and the competence of individual nurses (Yusrawati et al., 2024).

Knowledge is particularly important because emergency nurses must translate theoretical understanding into rapid clinical action (Geddam & Raj Kiran, 2024). Nurses with adequate knowledge are more likely to recognize abnormal airway, breathing, and circulation findings; interpret changes in consciousness; identify shock or neurological

emergencies; establish appropriate triage categories; and initiate interventions without unnecessary delay (Thanh et al., 2024). Conversely, insufficient or outdated knowledge may contribute to inaccurate prioritization, hesitation in decision-making, inappropriate procedures, and delayed collaboration with physicians or other members of the emergency team (Parrott et al., 2024). Even when medical equipment and standard operating procedures are available, emergency services may remain suboptimal if nurses do not adequately understand when and how those resources should be used. Assessing nurses' knowledge and its relationship with timeliness is therefore necessary for developing targeted education, simulation, supervision, and competency-based training (Ratanto et al., 2021).

Previous Indonesian studies have examined response time in relation to workload, years of service, educational background, emergency training, patient conditions, and nurse performance. Several studies have also indicated an association between nurses' knowledge and response time (Tantri & Amir, 2022). However, the results cannot automatically be generalized to every hospital because differences in staffing, patient volume, referral systems, institutional policies, professional experience, and local resources may produce different patterns (Wahyuni et al., 2021). Evidence from regional hospitals, particularly in South Sulawesi, remains limited. Furthermore, many previous studies have treated response time as a general service indicator without specifically linking nurses' knowledge to the actual timeliness of emergency management among emergency patients. No specific empirical evidence was available regarding this relationship in the Emergency Department of Sinjai Regional General Hospital, although such local evidence is essential for evaluating staff competency and designing contextually appropriate quality-improvement programs.

The novelty of this study lies in its context-specific examination of nurses' knowledge as a clinical determinant of timely emergency management at the Emergency Department of Sinjai Regional General Hospital. Rather than evaluating response time solely as an administrative performance indicator, this study positions timeliness as the practical manifestation of nurses' cognitive competence in recognizing, prioritizing, and managing emergency conditions. By involving all 21 nurses working in the department in 2024, the study provides a comprehensive description of the local nursing workforce and minimizes selection within the target population. Therefore, this study aims to determine the relationship between nurses' level of knowledge and the timeliness of emergency management among emergency patients at the Emergency Department of Sinjai Regional General Hospital in 2024. Its findings are expected to provide evidence for hospital management in developing continuing education, emergency simulations, competency evaluations, clinical supervision, and service policies that support faster, safer, and more standardized emergency care.

METHODS

This study employed a quantitative analytical observational design with a cross-sectional approach (Nkadimeng et al., 2024) to examine the relationship between nurses' knowledge level and the timeliness of emergency management. The research was conducted in the Emergency Department of Sinjai Regional General Hospital, South Sulawesi, Indonesia, in 2024. The study population consisted of all 21 nurses working in the Emergency Department. Because the population was relatively small, total sampling was applied, resulting in 21 nurses as research respondents. Nurses who were actively working in the Emergency Department, directly involved in managing emergency patients, and willing to participate by signing an informed-consent form were included in the study. Nurses who were on extended leave, undergoing further education, or unavailable during data collection were excluded.

The independent variable was the nurses' level of knowledge regarding emergency management, while the dependent variable was the timeliness of emergency management. Knowledge was measured using a structured questionnaire covering emergency-patient assessment, triage principles, airway, breathing, and circulation management, identification of life-threatening conditions, initial nursing interventions, and emergency service procedures. Each correct response was assigned a score of one, while an incorrect response was assigned a score of zero. The total scores were subsequently classified into good, moderate, and poor knowledge categories based on predetermined scoring criteria. The timeliness of emergency management was assessed through direct observation using a standardized observation sheet. Response time was calculated from the patient's arrival at the Emergency Department until the nurse initiated the appropriate assessment or emergency intervention. Emergency management was categorized as timely when it was provided in accordance with the hospital's response-time standards and the patient's triage priority, particularly within zero to five minutes for priority-one patients. Management exceeding the prescribed response-time standard was categorized as not timely.

Before data collection, respondents received information regarding the study's objectives, procedures, potential benefits, confidentiality, and voluntary participation. Knowledge questionnaires were completed individually, while the timeliness of management was recorded through observation without interfering with routine emergency services. Respondent identities were replaced with identification codes to maintain confidentiality.

Data were processed through editing, coding, entry, cleaning, and tabulation. Univariate analysis was conducted to describe respondents' characteristics, knowledge levels, and timeliness of emergency management using frequencies and percentages. Bivariate analysis was performed using the Fisher's exact test because of the small sample size and the possibility of expected cell frequencies below five. The level of statistical significance was set at $\alpha = 0.05$. A p-value of less than 0.05 indicated a statistically significant relationship between nurses' knowledge level and the timeliness of emergency management. The study was conducted in accordance with research ethics principles, including autonomy, confidentiality, beneficence, non-maleficence, and justice

RESULTS

Respondent Characteristics

Table 1 presents the characteristics of the 21 nurses working in the Emergency Department of Sinjai Regional General Hospital. Most respondents were aged 26–35 years (57.1%), female (61.9%), held a Diploma III in Nursing (57.1%), had worked for more than five years (61.9%), and had attended emergency nursing training (71.4%).

Table 1.
Characteristics of Respondents (n = 21)

Respondent characteristics	Frequency (n)	Percentage (%)
Age		
20–25 years	3	14.3
26–35 years	12	57.1
>35 years	6	28.6
Gender		
Male	8	38.1
Female	13	61.9
Educational level		
Diploma III in Nursing	12	57.1
Bachelor of Nursing/Ners	9	42.9
Length of employment		
≤5 years	8	38.1

>5 years	13	61.9
Emergency nursing training		
Attended	15	71.4
Never attended	6	28.6

Univariate Analysis

The univariate analysis included nurses' knowledge level and the timeliness of emergency management. Table 2 shows that 11 respondents (52.4%) had a good level of knowledge, six respondents (28.6%) had a moderate level of knowledge, and four respondents (19.0%) had a poor level of knowledge.

Table 2.
Distribution of Nurses' Knowledge Levels (n = 21)

Knowledge level	Frequency (n)	Percentage (%)
Good	11	52.4
Moderate	6	28.6
Poor	4	19.0
Total	21	100.0

These findings indicate that more than half of the nurses had good knowledge of emergency management. Nevertheless, ten respondents were still categorized as having moderate or poor knowledge, demonstrating the need for continuous education and competency development in emergency nursing.

Table 3 shows that 14 respondents (66.7%) provided timely emergency management, whereas seven respondents (33.3%) did not provide emergency management within the established response-time standard.

Table 3.
Distribution of the Timeliness of Emergency Management (n = 21)

Timeliness of management	Frequency (n)	Percentage (%)
Timely	14	66.7
Not timely	7	33.3
Total	21	100.0

The results demonstrate that most nurses managed emergency patients within the established response-time standard. However, one-third of the respondents did not provide timely management, suggesting that the timeliness of emergency services still requires improvement.

Bivariate Analysis

For bivariate analysis, moderate and poor knowledge levels were combined into the "insufficient knowledge" category because of the small number of respondents. Among the 11 nurses with good knowledge, ten respondents (90.9%) provided timely emergency management, while one respondent (9.1%) did not. Among the ten nurses with insufficient knowledge, four respondents (40.0%) provided timely management, whereas six respondents (60.0%) did not provide timely management.

Table 4.
Relationship Between Nurses' Knowledge Level and the Timeliness of Emergency Management (n = 21)

Nurses' knowledge level	Timely, n (%)	Not timely, n (%)	Total, n (%)	p-value
Good	10 (90.9)	1 (9.1)	11 (100.0)	0.024
Insufficient	4 (40.0)	6 (60.0)	10 (100.0)	
Total	14 (66.7)	7 (33.3)	21 (100.0)	

The Fisher's exact test produced a *p*-value of 0.024, which was lower than the significance level of 0.05. Therefore, the null hypothesis was rejected, indicating a statistically significant relationship between nurses' knowledge level and the timeliness of emergency management at the Emergency Department of Sinjai Regional General

Hospital. Nurses with good knowledge were more likely to provide timely emergency management than nurses with insufficient knowledge. These findings suggest that better knowledge of triage, initial assessment, recognition of life-threatening conditions, and emergency procedures contributes to faster and more appropriate management of emergency patients.

DISCUSSION

The findings showed that most nurses in the Emergency Department of Sinjai Regional General Hospital were aged 26-35 years, female, Diploma III in Nursing graduates, had worked for more than five years, and had attended emergency nursing training. These characteristics indicate that most respondents were within the productive age group and had adequate clinical experience. Productive age, work experience, educational background, and emergency training may support nurses' ability to understand patients' conditions and make rapid clinical decisions. Nurses with longer work experience generally have more opportunities to encounter various emergency cases, apply triage principles, and develop confidence in performing initial emergency interventions. Nevertheless, work experience alone does not guarantee appropriate practice when it is not supported by current knowledge and regular competency development.

The univariate analysis demonstrated that 11 nurses (52.4%) had good knowledge, while six nurses (28.6%) had moderate knowledge and four nurses (19.0%) had poor knowledge. These findings suggest that most respondents understood the fundamental principles of emergency management, including triage, primary assessment, recognition of life-threatening conditions, and initial interventions based on airway, breathing, and circulation priorities. This result may be associated with respondents' educational background, duration of employment, clinical experience, and participation in emergency nursing training (Dzakiy et al., 2024).

Knowledge represents an essential cognitive foundation for nursing practice. In an emergency department, nurses must rapidly identify clinical problems, establish patient priorities, and determine the most appropriate initial intervention (Mekonen et al., 2024). Adequate knowledge enables nurses to distinguish patients requiring immediate resuscitation from those whose conditions allow delayed treatment. It also helps nurses recognize subtle signs of deterioration before more severe complications develop (Gunawan et al., 2023). Conversely, insufficient knowledge can lead to inappropriate triage classification, hesitation in decision-making, delayed interventions, and ineffective coordination with other healthcare professionals.

Although most respondents had good knowledge, almost half were classified as having moderate or poor knowledge (Fekete et al., 2022). This finding indicates that disparities in emergency nursing competence remained among the respondents. These disparities may be influenced by differences in education, participation in Basic Trauma and Cardiac Life Support training, exposure to emergency cases, access to updated clinical guidelines, and opportunities to participate in simulation-based learning. Therefore, continuing professional education should be conducted regularly because emergency-management standards, resuscitation procedures, and clinical decision-making guidelines may change following developments in scientific evidence (Kako & Hutton, 2023).

Regarding the dependent variable, 14 nurses (66.7%) provided timely emergency management, whereas seven nurses (33.3%) did not provide management within the established response-time standard. This finding demonstrates that most emergency patients received an initial response according to their level of priority. Timely intervention is essential because patients with airway obstruction, respiratory failure, shock, severe trauma, or decreased consciousness may experience rapid deterioration (Herwansyah et al., 2023). The Indonesian Ministry of Health emphasizes that priority-one patients require

an initial response within approximately zero to five minutes. Compliance with this response-time target reflects the readiness and quality of emergency services (Sangngam et al., 2023).

However, the proportion of nurses who did not provide timely management remains clinically important. Delayed management can increase the risk of complications, disability, prolonged hospitalization, and mortality (Krongthaeo et al., 2022). Delays may result from multiple factors, including limited knowledge, high workload, simultaneous patient arrivals, inadequate staffing, incomplete equipment, ineffective communication, and delays in interprofessional coordination (Handayani et al., 2022). Therefore, response time should not be interpreted solely as an individual performance indicator because it is also affected by the organization of emergency services and the availability of supporting resources (Jibril et al., 2024).

The bivariate analysis showed that 10 of the 11 nurses with good knowledge (90.9%) provided timely emergency management. In comparison, only four of the ten nurses with insufficient knowledge (40.0%) provided timely management. Fisher's exact test produced a p -value of 0.024, indicating a statistically significant relationship between nurses' knowledge level and the timeliness of emergency management. Thus, nurses with good knowledge were more likely to manage emergency patients within the required response-time standard (Jones et al., 2024).

This association can be explained by the role of knowledge in accelerating clinical reasoning. Nurses with adequate knowledge can recognize emergency signs, assign appropriate triage categories, determine intervention priorities, and initiate actions without unnecessary hesitation. Knowledge of the primary survey also allows nurses to conduct systematic assessments while simultaneously managing life-threatening problems. In contrast, limited knowledge may increase uncertainty, dependence on instructions from other professionals, and the time required to determine the appropriate intervention.

The findings are consistent with the study conducted (Ximenes et al., 2024) which found a relationship between nurses' knowledge and response time in the emergency department of Porsea Regional General Hospital. They are also in line with a recent Indonesian scoping review indicating that nurses' education, training, work experience, patient acuity, workload, and healthcare infrastructure influence emergency response time. The review reported that the national average proportion of rapid responses among emergency nurses was approximately 66.24%, showing that the timeliness of emergency nursing services remains inconsistent across Indonesian hospitals.

Nevertheless, one respondent with good knowledge did not provide timely management, while four respondents with insufficient knowledge were able to respond promptly (Neuendorff et al., 2024). This pattern suggests that knowledge is not the only factor determining timeliness. Nurses with good theoretical knowledge may experience delays because of overcrowding, high workload, equipment limitations, or simultaneous critical cases (Barrett et al., 2021). Conversely, nurses with lower questionnaire scores may respond rapidly because of extensive practical experience, familiarity with hospital procedures, effective teamwork, or immediate support from colleagues. Therefore, improving knowledge must be accompanied by adequate staffing, functional equipment, clear standard operating procedures, effective triage systems, and supportive clinical leadership (Lee et al., 2021).

The results have practical implications for Sinjai Regional General Hospital. Hospital management should periodically assess nurses' emergency competencies and provide structured training, case discussions, resuscitation drills, and simulation-based education. Particular attention should be given to triage accuracy, primary assessment, airway management, cardiopulmonary resuscitation, shock management, and early recognition of clinical deterioration. Routine audits of response time should also be performed to identify the types of cases, shifts, and service conditions associated with delays.

This study contributes local evidence by demonstrating that nurses' knowledge is significantly associated with the timeliness of emergency management. However, its cross-sectional design only identifies an association and cannot establish a causal relationship. The small sample of 21 nurses from one hospital also limits the generalizability of the findings. Furthermore, response time may have been influenced by patient severity, workload, staffing patterns, and resource availability, which were not included in the analysis. Future studies should involve larger samples from multiple hospitals and use multivariable analysis to examine the combined effects of knowledge, training, workload, work experience, staffing, and patient acuity on the timeliness of emergency management.

CONCLUSION

This study concluded that most nurses in the Emergency Department of Sinjai Regional General Hospital had a good level of knowledge, and the majority provided timely management to emergency patients. Statistical analysis using Fisher's exact test showed a significant relationship between nurses' knowledge level and the timeliness of emergency management ($p = 0.024$). Nurses with good knowledge were more likely to provide timely management than those with insufficient knowledge. Therefore, strengthening nurses' knowledge through continuous education, emergency training, clinical simulations, competency evaluations, and regular response-time audits is recommended to improve the quality and safety of emergency services. Future studies should involve larger samples and examine additional factors, such as workload, staffing, work experience, training history, patient acuity, and the availability of emergency equipment.

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