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RESEARCH ARTICLES

Pendidikan, Masa Kerja, dan Pelatihan terhadap Pengetahuan Perawat dalam Menangani Pasien Gawat Darurat

Education, Tenure, and Training on Nurse Knowledge in Handling Emergency Patients

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Abstract

The knowledge and competencies of nurses critically influence the quality and safety of emergency patient care. This study aimed to analyze the relationship between education level, tenure, and participation in emergency training programs with nurses' knowledge in handling emergency patients. An analytical observational study with a cross-sectional design was conducted among 30 nurses working in the Emergency Department of a Type C regional hospital in Indonesia. Data were collected using a structured and validated questionnaire. Bivariate analysis was performed using Fisher's Exact Test with a significance level of α = 0.05. The findings showed that most respondents were aged 20–30 years (80%), had higher educational qualifications (53.3%), had worked for less than five years (60%), and had participated in formal emergency training (53.3%). Significant associations were identified between nurses' knowledge and educational level (p = 0.011), tenure (p = 0.007), and emergency training participation (p = 0.014). Nurses with higher education and emergency training demonstrated better knowledge levels. Interestingly, nurses with shorter working experience showed higher knowledge, possibly due to greater exposure to updated curricula and recent emergency training. This study highlights the importance of continuous professional development, structured emergency training, and competency-based nursing education in improving emergency nursing preparedness and patient safety. Hospitals should strengthen regular certification and refresher training programs to maintain the quality of emergency healthcare services.

Keywords: *emergency care, knowledge, nursing education*

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Abstrak

Pengetahuan dan kompetensi perawat sangat mempengaruhi kualitas dan keselamatan perawatan pasien darurat. Penelitian ini bertujuan untuk menganalisis hubungan antara jenjang pendidikan, lama kerja, dan partisipasi dalam program pelatihan gawat darurat dengan pengetahuan perawat dalam menangani pasien gawat darurat. Studi observasional analitis dengan desain cross-sectional dilakukan di antara 30 perawat yang bekerja di Departemen Gawat Darurat rumah sakit tipe C di Indonesia. Data dikumpulkan menggunakan kuesioner terstruktur dan tervalidasi. Analisis bivariat dilakukan dengan menggunakan Fisher's Exact Test dengan tingkat signifikansi α = 0,05. Temuan menunjukkan bahwa sebagian besar responden berusia 20-30 tahun (80%), memiliki kualifikasi pendidikan yang lebih tinggi (53,3%), telah bekerja kurang dari lima tahun (60%), dan telah berpartisipasi dalam pelatihan kegawatdarurat formal (53,3%). Hubungan yang signifikan diidentifikasi antara pengetahuan perawat dan tingkat pendidikan (p = 0,011), masa kerja (p = 0,007), dan partisipasi pelatihan darurat (p = 0,014). Perawat dengan pendidikan tinggi dan pelatihan darurat menunjukkan tingkat pengetahuan yang lebih baik. Menariknya, perawat dengan pengalaman kerja yang lebih pendek menunjukkan pengetahuan yang lebih tinggi, mungkin karena paparan yang lebih besar terhadap kurikulum yang diperbarui dan pelatihan darurat baru-baru ini. Studi ini menyoroti pentingnya pengembangan profesional berkelanjutan, pelatihan darurat terstruktur, dan pendidikan keperawatan berbasis kompetensi dalam meningkatkan kesiapsiagaan keperawatan darurat dan keselamatan pasien. Rumah sakit harus memperkuat program sertifikasi dan pelatihan penyegaran secara teratur untuk menjaga kualitas layanan kesehatan darurat.

Kata Kunci: *pengetahuan, perawatan darurat, program pelatihan*

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Highlight:

- Nurses with higher educational qualifications and those who have participated in formal emergency training programs (such as BTCLS) demonstrate significantly better knowledge levels in handling emergency patients.
- Interestingly, nurses with shorter working experience (<5 years) show significantly higher emergency care knowledge compared to their more experienced counterparts. This trend is likely due to recent exposure to updated academic curricula, current clinical guidelines, and new emergency training.
- Work experience alone does not guarantee up-to-date emergency competence, as experienced staff can face knowledge stagnation over time. Therefore, it is critical for hospitals to implement mandatory certification, regular competency evaluations, and periodic refresher training programs to ensure patient safety and maintain high-quality emergency healthcare services.

INTRODUCTION

In contemporary healthcare systems, the demand for high-quality emergency care has increased substantially due to the rising incidence of trauma, cardiovascular

emergencies, infectious diseases, and disaster-related incidents. Globally, emergency departments (EDs) continue to experience increasing patient visits each year, contributing to overcrowding, delayed treatment, and higher risks of morbidity and mortality among critically ill patients (Giamello et al., 2023). In Indonesia, emergency care services also face significant challenges, including high patient loads, limited human resources, and variability in emergency nursing competencies (Maisyaroh et al., 2025). Delays in emergency response and inadequate clinical decision-making have been associated with increased mortality rates, prolonged hospitalization, and reduced patient safety in emergency settings (Bijani et al., 2021). These conditions place emergency nurses at the forefront of critical care delivery, requiring rapid assessment, accurate decision-making, and effective intervention within a limited timeframe.

Within this high-stakes environment, nurses play a central role in ensuring timely, safe, and effective emergency care because they are often the first healthcare professionals to assess and stabilize patients. Nurses' knowledge and preparedness directly influence the quality of triage, resuscitation, airway management, and emergency interventions, all of which contribute significantly to patient outcomes (Azizpour et al., 2022). Knowledge, as a foundational component of professional nursing practice, involves not only theoretical understanding but also the ability to apply evidence-based principles in complex and rapidly evolving clinical situations (Smith et al., 2021). In emergency care, where seconds may determine survival outcomes, nurses must possess adequate competencies to perform advanced assessments, initiate immediate interventions, and collaborate effectively within multidisciplinary teams.

Despite the critical importance of emergency nursing competency, previous studies have reported inconsistent findings regarding the factors influencing nurses' knowledge in emergency patient management (Bhatarasakoon and Chiaranai, 2024). Several studies indicate that higher educational attainment and participation in emergency training programs improve nurses' competencies, while other studies suggest that work experience alone does not always reflect better emergency knowledge due to outdated clinical practices and limited continuing education opportunities (Welch, 2025). Furthermore, most previous studies examined these variables separately and rarely explored the combined influence of education level, tenure, and emergency training on nurses' knowledge, particularly in local hospital settings. This gap highlighted the need for further investigation to identify the most influential factors affecting emergency nurses' knowledge as a basis for strengthening competency development and improving the quality of emergency healthcare services.

Nursing education plays a pivotal role in shaping the competencies required for emergency care. With the continuous evolution of medical science and technology, nursing curricula must be regularly updated to incorporate the latest clinical guidelines, simulation-based learning, and interdisciplinary approaches (Notarnicola et al., 2024). Formal nursing education provides foundational competencies in patient assessment, pharmacology, pathophysiology, and ethical decision-making, which are essential in emergency settings (Gholipour et al., 2025). However, the increasingly complex nature of emergency care, including mass casualty incidents, pandemic responses, and geriatric emergencies, requires nurses to possess not only theoretical knowledge but also adaptive clinical competencies and rapid decision-making skills (Al Thobaity, 2024).

Despite the recognized importance of nursing education and training, previous

studies have reported inconsistent findings regarding the determinants of emergency nursing knowledge and competency (Bray, 2024). Several studies found that higher educational attainment significantly improves nurses' emergency care competencies and clinical preparedness because advanced education enhances evidence-based thinking and critical decision-making abilities. In contrast, other studies reported that educational level alone does not consistently predict emergency care performance, particularly when nurses lack practical exposure and continuous skills training. Similar inconsistencies are also found regarding work experience. Some researchers argue that longer tenure strengthens clinical judgment and emergency response capabilities through repeated exposure to critical situations. However, other studies demonstrate that recently graduated nurses may possess better emergency knowledge because they are more familiar with updated guidelines, simulation-based learning, and current evidence-based practices.

In addition, the effectiveness of emergency-related training programs such as Basic Trauma and Cardiac Life Support (BTCLS) and Basic Life Support (BLS) remains debated. While several studies report that structured emergency training improves nurses' competencies and confidence, others indicate that knowledge retention may decline without regular refresher programs and institutional support. These inconsistencies suggest that the relationship between education, work experience, training participation, and emergency nursing knowledge remains inconclusive.

Most previous studies have examined these factors separately rather than analyzing their combined influence on nurses' knowledge in emergency patient management, particularly in local hospital settings and developing healthcare systems. Therefore, this study investigates the relationship between education level, tenure, and emergency training participation with nurses' knowledge in handling emergency patients. Understanding these relationships is important for strengthening emergency nursing competencies, improving patient safety, and enhancing the quality of emergency healthcare services.

METHODS

This research employed an analytical observational design with a cross-sectional approach to investigate the relationship between nurses' knowledge in emergency patient handling and three independent variables: education level, tenure (tenure), and participation in training programs. The cross-sectional design was chosen because it allows for simultaneous measurement of all variables at a single point in time, providing a snapshot of associations within the population studied.

This study was conducted in 2024 in the 24-hour Emergency Department (ED) of a Type C regional public hospital in a semi-urban area of Indonesia, which serves as a busy referral center for acute trauma and critical illnesses. Utilizing a total sampling technique due to the small population size, the study included all 30 registered nurses actively involved in ED patient care who met the inclusion criteria of having at least six months of tenure, volunteering for the study, and completing the questionnaire. The research analyzed the relationship between a dependent variable nurses' emergency handling knowledge level (categorized as "Good" or "Not Good") and three independent variables: education level, tenure, and emergency training participation (e.g., BTCLS). While the total sampling approach maximized data representation, the study's small sample size and single-center design stand as recognized limitations that

may affect external validity and generalizability to larger tertiary facilities.

Primary data were collected using a validated and reliable self-administered questionnaire divided into four sections: demographics, education level, training history (BTCLS/BLS/ACLS), and emergency care knowledge (ABC management, surveys, CPR, and triage). The knowledge section, adapted from standardized guidelines to fit the local context, utilized multiple-choice and true/false questions (scored 1 for correct, 0 for incorrect) to categorize scores into "Good" and "Not Good" knowledge. Before deployment, the instrument was refined through content validity evaluation by three nursing experts and a subsequent pilot test, which confirmed its validity (Pearson's) and reliability (Cronbach's Alpha = 0.82). This process strictly adhered to ethical standards, obtaining formal institutional approval and written informed consent from all participants while ensuring complete anonymity and data confidentiality.

Data analysis was conducted using SPSS version 25 through univariate and bivariate statistical procedures. Univariate analysis employed frequencies and percentages to describe the distribution of respondents' demographic and professional characteristics. Bivariate analysis examined associations between the independent categorical variables (education, tenure, and training) and the dependent variable (knowledge level) using Fisher's Exact Test with a significance threshold of $p < 0.05$. Fisher's Exact Test was specifically selected instead of the Chi-Square test to ensure robust and accurate statistical estimates, as it is uniquely suited for small sample sizes (n=30) where expected cell counts in contingency tables frequently fall below five. Ethical approval for this study was obtained from the institutional ethics committee under number KEI-01-231124.

RESULTS AND DISCUSSIONS

Analysis of emergency nurses

The univariate analysis (Table 1) provides a descriptive overview of the characteristics of the nurses participating in the study, focusing on demographic and professional factors related to their capacity in handling emergency patients. The data is summarized into frequencies and percentages to highlight general patterns across key variables.

Table 1. Univariate analysis of emergency nurses

Variable	n	%
Age (20–30)	24	80.0
Age (31–40)	6	20.0
High Education	16	53.3
Low Education	14	46.7
New Service (<5 yrs)	18	60.0
Old Service (≥5 yrs)	12	40.0
Trained	16	53.3
Not Trained	14	46.7
Good Knowledge	18	60.0
Not Good Knowledge	12	40.0

Source: Primary data, 2024

Age Distribution. Most respondents (80%) were between 20–30, while only 20% were in the 31–40 age group. This indicates that the emergency department workforce is predominantly young, possibly consisting of recently graduated nurses. This demographic trend may imply a need for structured orientation and mentorship programs to compensate for limited clinical exposure. Educational Background. 53.3% of nurses had higher education (Diploma III or above), while 46.7% had lower educational attainment. The relatively balanced distribution suggests a mixed level of formal academic preparation. The slight dominance of higher-educated nurses is a positive indicator, as academic preparation is often linked with improved critical thinking and emergency decision-making skills. Tenure (Tenure). 60% of the respondents were categorized as new nurses (with less than 5 years of service), compared to 40% who were more experienced. This suggests a fresh and possibly dynamic workforce and highlights a potential knowledge gap in real-time emergency scenarios, which typically benefit from accumulated hands-on experience.

Training Participation. A little more than half (53.3%) of the nurses had received formal emergency care training, such as BTCLS (Basic Trauma and Cardiac Life Support). The remaining 46.7% had not participated in such training, underlining a critical opportunity for improvement in professional development. Without systematic training, nurses may lack the practical competencies for high-stakes emergency interventions. Knowledge Level. 60% of nurses demonstrated a good level of knowledge in handling emergency patients, while 40% were categorized as having insufficient knowledge. While the majority showed competence, a significant portion of nurses with inadequate knowledge represents a serious concern for patient safety and care quality, especially in urgent care settings where precision is vital.

The univariate results reveal that the nurse population in the emergency department is predominantly young, moderately educated, and inconsistently trained. While most nurses demonstrated adequate knowledge, a substantial minority did not, reflecting the urgent need for structured training programs and knowledge refreshers. Enhancing access to emergency-specific certifications and reinfo.

Relationship between education, tenure, training, and knowledge

The bivariate analysis demonstrated statistically significant associations between education level, length of service, training participation, and nurses' knowledge in handling emergency patients. Nurses with higher educational qualifications showed significantly better knowledge compared with those with lower educational backgrounds. Specifically, nurses with higher education were 7.80 times more likely to have good knowledge regarding emergency patient management ($p = 0.011$). This finding suggests that higher formal education contributes to stronger theoretical understanding and clinical reasoning abilities in emergency care.

Regarding tenure, nurses with shorter working experience (<5 years) demonstrated significantly higher knowledge levels than nurses with ≥5 years of service. The analysis indicated that nurses with shorter tenure were 17.29 times more likely to possess good emergency care knowledge ($p = 0.007$). This result may reflect the influence of more recent academic preparation, updated clinical guidelines, and current emergency nursing training among newer nurses. Training participation was also significantly associated with nurses' knowledge. Nurses who had attended emergency-related training programs were 7.80 times more likely to demonstrate good knowledge compared with nurses who had never participated in such training ($p = 0.014$).

Table 2. Relationship between education, tenure, training, and knowledge

Variable	Category	Good Knowledge n (%)	Poor Knowledge n (%)	*p-value*
Education	Higher	13 (81.2)	3 (18.8)	0.011*
	Lower	5 (35.7)	9 (64.3)	
Tenure	<5 Years	11 (91.7)	1 (8.3)	0.007*
	≥5 Years	7 (38.9)	11 (61.1)	
Training	Yes	13 (81.2)	3 (18.8)	0.014*
	No	5 (35.7)	9 (64.3)	

Note: *Fisher's Exact Test, significant if the p-value < 0.05

This finding emphasizes the importance of structured emergency training programs in improving nurses' competence and preparedness in handling emergency patients. Overall, the results indicate that higher education, participation in emergency training, and shorter working experience were associated with better knowledge among emergency nurses. Although the confidence intervals were relatively wide due to the limited sample size, all variables showed statistically significant associations, highlighting their potential contribution to improving emergency nursing competence.

The findings of this study imply that improving emergency nurses' knowledge requires more than relying on work experience alone. Hospitals should strengthen competency-based nursing development through regular emergency training, continuing professional education, and routine competency evaluations. Emergency departments are encouraged to implement mandatory certification programs such as BTCLS, BLS, and ACLS, supported by simulation-based training and periodic refresher courses. In addition, hospitals should provide mentoring systems and support academic advancement to ensure nurses remain updated with current emergency care standards. These strategies may improve clinical competence, patient safety, and the overall quality of emergency healthcare services.

The Role of Education in Knowledge Acquisition. The data revealed that nurses with higher educational qualifications (Diploma III or above) possessed significantly better knowledge of managing emergency patients ($p = 0.011$). This aligns with existing literature asserting that formal education fosters a deeper understanding of clinical reasoning, evidence-based practices, and protocol adherence, foundational competencies in emergency care settings. Modern nursing education integrates technical knowledge, critical thinking, and scenario-based simulations, preparing graduates for high-pressure environments such as the Emergency Department (ED) (Han et al., 2023). However, knowledge gaps among some highly educated nurses indicate that formal education alone is insufficient. Without continuous learning and practical reinforcement, even those with advanced credentials may struggle to retain or apply critical knowledge in real-time (Joo et al., 2025). Therefore, educational institutions must ensure curricula remain aligned with the latest emergency care standards and provide opportunities for lifelong learning (Sharbini et al., 2025).

Surprising Inverse Correlation with Tenure. Interestingly, this study found that nurses with shorter tenure (<5 years) had significantly better knowledge than their more experienced counterparts ($p = 0.007$). While experience is typically associated with practical expertise and clinical intuition, these findings suggest that recent graduates may benefit from more current training and updated academic content (Serna et al., 2024). Furthermore, newly hired nurses often undergo structured onboarding programs and competency evaluations, reinforcing key emergency care skills early in their careers

(Makhlouf et al., 2024). In contrast, nurses with longer service may rely on outdated knowledge or procedural habits that no longer reflect best practices. The phenomenon of knowledge stagnation among experienced staff is well-documented in nursing research (Saçıkara and Cingil, 2024). It often results from limited access to refresher courses, lack of institutional emphasis on continuing education, or complacency over time. This highlights the urgent need for hospitals to institutionalize mandatory and recurring professional development programs, especially targeting long-serving staff to prevent skill erosion and promote a culture of lifelong learning (Liao et al., 2024).

Impact of Training on Emergency Knowledge. The strong association between participation in emergency training (such as BTCLS) and higher knowledge levels (p = 0.014) reinforces the critical role of practical, skills-based learning in emergency preparedness. Hands-on training complements theoretical education by simulating real-life scenarios that enhance decision-making, technical proficiency, and confidence under pressure. Moreover, certified training often includes standardized protocols such as the ABC (Airway, Breathing, Circulation) approach and Primary & Secondary Survey techniques, essential in emergency care delivery (Ong et al., 2025). Yet, the finding that a small proportion of trained nurses still demonstrated poor knowledge suggests gaps in training quality, frequency, or follow-up mechanisms (Pavón et al., 2025). Passive participation or lack of ongoing evaluation may reduce training effectiveness (Al-abri et al., 2025). On the other hand, a notable subset of untrained nurses performed well, possibly due to recent academic exposure, mentorship, or informal learning through clinical experience. These mixed results call for a more systematic and standardized approach to emergency training. Institutions should provide initial training and conduct regular assessments, simulations, and certification renewals. Integration of training outcomes into performance reviews may also incentivize active participation and knowledge retention (Malya et al., 2025).

However, this study has several limitations. The small sample size (n=30) may limit the generalizability of the findings. The cross-sectional design only identifies associations and cannot determine causal relationships. In addition, the use of self-administered questionnaires may introduce response and recall bias. The single-center setting may also limit external validity. Future studies with larger multicenter samples and longitudinal designs are recommended.

CONCLUSIONS

This study demonstrated that education level, tenure, and participation in emergency training programs were significantly associated with nurses' knowledge in handling emergency patients. Nurses with higher educational qualifications and formal emergency training showed better knowledge levels. Interestingly, nurses with shorter work experience demonstrated higher knowledge, possibly due to greater exposure to updated curricula and recent training programs. These findings emphasize the importance of continuous professional development, regular emergency training, and competency-based nursing education in strengthening emergency nursing preparedness. Hospitals should implement periodic certification, refresher training, and ongoing competency evaluation to ensure nurses maintain updated knowledge and skills in emergency care. Strengthening emergency nursing competencies may contribute to improved patient safety and the quality of emergency healthcare services.

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CONFLICT OF INTEREST

The author(s) declare that they have no conflict interest

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