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# THE CORRELATION BETWEEN EMERGENCY DEPARTMENT NURSE WORKLOAD AND TRIAGE DETERMINATION ACCURACY

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## ABSTRACT

**Background:** *The Emergency Department (ED) is the primary entry point for 24-hour hospital healthcare services, and accurate triage determination is essential for prioritizing patient care based on clinical severity to ensure patient safety. High patient volumes and administrative demands often raise nurse workload, which may affect concentration and clinical decision-making accuracy.*

**Objectives:** *This study aimed to analyze the correlation between Emergency Department (ED) nurse workload and triage determination accuracy*

**Methods:** *This quantitative study used a cross-sectional design. The population comprised all 120 ED nurses across the Sari Asih Hospital network, enrolled using a total sampling (census) technique. Data were collected using a workload questionnaire and a triage accuracy observation sheet, and analyzed using the Chi-Square test.*

**Results:** *Most respondents had a high workload (69 nurses, 57.5%), followed by moderate (45, 37.5%) and low workload (6, 5%). Most nurses performed triage inaccurately (88, 73.3%), while 32 (26.7%) were accurate. The Chi-Square test showed a significant correlation between nurse workload and triage determination accuracy ($p < 0.001$).*

**Conclusion:** *There is a significant correlation between ED nurse workload and triage determination accuracy at Sari Asih Hospital: higher workload is associated with lower triage accuracy.*

***Keywords:*** *workload; triage accuracy; emergency nurse; hospital*

## INTRODUCTION

The Emergency Department (ED) is the frontline unit responsible for delivering time-critical, life-saving care, and triage is the process by which patients are sorted and prioritized according to clinical urgency (Christian, 2019). Accurate triage decisions are essential for patient safety, since misclassification, whether under-triage or over-triage, can delay life-saving treatment or waste scarce emergency resources (Suamchaiyaphum et al., 2024).

ED overcrowding has become a persistent, worldwide public health problem, driven by rising patient volumes that outpace available staff and physical capacity (Sartini et al., 2022). This overcrowding is consistently associated with delayed treatment, prolonged length of stay, and a higher risk of adverse patient outcomes across health systems internationally (Darraj et al., 2023). As patient volumes rise, the workload carried by ED nurses increases correspondingly, and heavier nursing workload has been linked to poorer quality of care and worse patient outcomes in emergency settings (Drennan et al., 2024; Shin et al., 2018).

A growing body of international evidence links nurse-related factors directly to triage accuracy. Reviews synthesizing more than a decade of research consistently identify triage nurse characteristics including experience, workload, and time pressure as key determinants of triage accuracy, alongside patient characteristics and the work environment (Suamchaiyaphum et al., 2024). Large-scale studies in the Middle East, for example, have found triage accuracy ranging from roughly 45% to 85%, with workload and staffing density during a shift cited as significant contributing factors (AlSerkal et al., 2020; Mostafa & El-Atawi, 2025). Similarly, an observational study in South Korea found that classification accuracy was significantly related to the time nurses had available per patient, highlighting how workload-driven time pressure can compromise triage decisions (Seo et al., 2024). Despite this, standardized instruments for measuring nursing workload remain inconsistently applied across emergency settings internationally, which limits the comparability of findings and the ability to build robust, generalizable evidence (Griffiths et al., 2020).

Although several studies have examined ED nurse workload and triage accuracy separately, evidence directly linking the two, particularly across a multi-site hospital network remains limited, especially outside high-income health systems. The Sari Asih Hospital network, comprising eight EDs across the Tangerang and Serang areas of Banten province, offers a relevant setting to examine this relationship given its high and variable patient volume across sites. Based on this background, this study aimed to analyze the correlation between ED nurse workload and triage determination accuracy across the Sari Asih Hospital network. The findings are expected to inform hospital management on evidence-based strategies for nurse staffing and workload distribution to improve the safety and accuracy of emergency triage.

## METHODS

*Study Design and Participants*

This study employed a quantitative research design with a cross-sectional approach, conducted in the ED units of the Sari Asih Hospital network (Cipondoh, Ar-Rahmah, Ciledug, Sangiang, Karawaci, Bintaro, Ciputat, and Serang) between May and July 2026. The study population consisted of all staff nurses working in these ED units. A total sampling (census) technique was

applied, enrolling all 120 eligible nurses as respondents. The inclusion criterion was active ED staff nurses willing to participate; the exclusion criterion was nurses who declined participation.

*Research Instruments*

Three instruments were used. (1) A demographic data sheet captured respondent characteristics, including age, gender, educational background, and length of employment. (2) A workload questionnaire, adapted from Yulistiawan (2019), consisted of 12 items measured on a 5-point Likert scale (1–5). Workload was categorized as Low (score 12–28), Moderate (29–44), or High (45–60); the instrument's reliability yielded a Cronbach's Alpha of 0.959 (highly reliable). (3) A triage accuracy observation sheet, based on the hospital's Standard Operating Procedure (SOP) for triage, comprised 8 indicators evaluated on a Guttman scale (Yes = 2, No = 1); scores were classified as Accurate (score = 16) or Inaccurate (score < 16). [State the number and background of the validators involved, and the validity/reliability values obtained for the triage accuracy observation sheet, e.g., inter-rater reliability/Cohen's Kappa if tested.

*Data Analysis*

Data were processed using SPSS software. Univariate analysis was used to describe the frequency distribution and percentage of demographic characteristics, workload level, and triage accuracy. Bivariate analysis using the Chi-Square test ($\alpha = 0.05$) was performed to examine the correlation between nurse workload and triage determination accuracy.

## RESULTS

**Table 1. Demographic Characteristics of Respondents (N = 120)**

| Characteristics | Frequency | Percentage (%) |
|---|---|---|
| **Gender** | | |
| Male | 52 | 43.3 |
| Female | 68 | 56.7 |
| **Age (years)** | | |
| 21–30 | 91 | 75.8 |
| 31–40 | 25 | 20.8 |
| 41–50 | 4 | 3.3 |
| **Education Level** | | |
| Professional Nurse | 47 | 39.2 |
| Diploma in Nursing | 73 | 60.8 |
| **Length of Employment (years)** | | |
| 1–5 | 77 | 64.2 |
| 6–10 | 32 | 26.7 |
| 11–20 | 11 | 9.2 |
| **Workload Level** | | |
| High | 69 | 57.5 |
| Moderate | 45 | 37.5 |

| | | |
|---|---|---|
| Low | 6 | 5 |
| **Triage Determination Accuracy** | | |
| Inaccurate | 88 | 73.3 |
| Accurate | 32 | 26.7 |

Table 1 presents the characteristics of the 120 respondents. Most respondents were female (56.7%) and aged 21–30 years (75.8%). Regarding education, 60.8% held a Diploma in Nursing (D3) and 39.2% held a Bachelor's degree with a professional nurse qualification (Ners). Most respondents (64.2%) had 1–5 years of working experience. Regarding the main study variables, most nurses experienced a high workload (57.5%), and most performed triage inaccurately (73.3%).

**Table 2. Cross-Tabulation and Chi-Square Analysis Between Nurse Workload and Triage Determination Accuracy (N = 120)**

| Workload Level | Accurate n (%) | Inaccurate n (%) | Total n | p-value |
|---|---|---|---|---|
| Low | 5 (83.3) | 1 (16.7) | 6 | |
| Moderate | 19 (42.2) | 26 (57.8) | 45 | < 0.001 |
| High | 8 (11.6) | 61 (88.4) | 69 | |
| **Total** | **32 (26.7)** | **88 (73.3)** | **120** | |

## DISCUSSION

The findings confirm a statistically significant, inverse correlation between ED nurse workload and triage accuracy: as workload increases, triage determination accuracy decreases. This pattern is consistent with international evidence showing that triage errors are rarely isolated individual failures but instead arise from an interaction of human, organizational, and system-level factors — including workload and staffing adequacy (Fekonja et al., 2026).

The high proportion of nurses experiencing heavy workloads (57.5%) at the Sari Asih Hospital EDs mirrors patterns reported internationally, where lower nurse staffing levels in emergency departments are consistently associated with worse patient outcomes, including delays in treatment and increased adverse events (Drennan et al., 2024). Non-clinical, extra-role demands further divert nurses' attention away from comprehensive clinical assessment, a pattern also identified in systematic reviews of nurse staffing and quality of care in EDs, which found that inadequate staffing directly compromises the timeliness and accuracy of nursing care processes (Drennan et al., 2024; Shin et al., 2018).

Regarding triage performance, an alarming 73.3% inaccuracy rate was identified — notably higher than the 59.3%–85% range reported across recent international studies (AlSerkal et al., 2020; Mostafa & El-Atawi, 2025; Seo et al., 2024). An observational study of nurse-led triage similarly found that errors increased significantly during periods of high patient volume and limited time per assessment, supporting the interpretation that under time pressure, nurses rely more heavily on rapid visual heuristics rather than systematic, protocol-based assessment (Ausserhofer et al., 2021). This reliance

on rapid judgment increases the risk of both under-triage and over-triage, a pattern also confirmed in triage accuracy reviews spanning multiple health systems (Suamchaiyaphum et al., 2024; Smith et al., 2022).

The relationship between nurse experience and triage accuracy observed in this study is consistent with international research applying Benner's Novice-to-Expert framework to triage decision-making, which found that less experienced nurses were more susceptible to inaccurate triage decisions under high workload conditions, while more experienced nurses were better able to maintain accuracy despite similar pressures (Soola et al., 2022). This suggests that triage accuracy is not simply a matter of individual competence but reflects a dynamic interaction between experience, cognitive load, and the demands of the working environment — a relationship also highlighted in integrative reviews of triage education, which found that structured, ongoing training measurably improves triage accuracy regardless of baseline experience level (Butler et al., 2023).

These findings indicate that improving triage accuracy requires systemic workload management rather than relying solely on individual training or administrative reminders. This is supported by evidence that adequate nurse staffing and manageable workloads are associated not only with better patient safety outcomes but also with improved nurse wellbeing and retention (Woodnutt et al., 2025; Alharbi et al., 2025). Recommendations include optimizing nurse-to-patient staffing ratios, assigning dedicated administrative staff to non-clinical tasks, and implementing structured preceptorship models that pair senior and junior nurses during each shift — strategies consistent with international calls to strengthen organizational support and non-punitive safety culture in triage practice (Fekonja et al., 2023).

*Study Limitations*

This study has several limitations. First, the cross-sectional design captures workload and triage accuracy at a single point in time and therefore cannot establish causality between the two variables. Second, direct observation of triage performance may have introduced a Hawthorne effect, in which nurses performed more carefully because they were aware of being observed. Third, the study was conducted across a single hospital network, so the findings may not be generalizable to EDs with different staffing models or case-mix profiles. Future research using a longitudinal or multi-center design, together with standardized, validated workload measurement tools (Griffiths et al., 2020), is recommended to address these limitations.

## CONCLUSION

Most ED nurses at Sari Asih Hospital experience a high workload, and triage determination accuracy is predominantly inaccurate. There is a statistically significant correlation between ED

nurse workload and triage determination accuracy: the higher the nursing workload, the lower the accuracy of triage determination.

For hospital management, these findings support re-evaluating nurse staffing requirements using workload indicator analysis, reducing non-nursing administrative burdens, and establishing senior–junior nurse pairings per shift. ED nurses are encouraged to maintain strict adherence to standardized triage SOPs and to practice effective stress management to prevent occupational burnout. Future researchers may conduct time-motion observational studies and investigate additional factors influencing triage accuracy, such as response time, knowledge level, and leadership style.

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## CONFLICT OF INTEREST

The author hereby declares that this research is free from conflicts of interest with any party.

## DECLARATION ON THE USE OF ARTIFICIAL INTELLIGENCE (AI)

The author(s) declare that no Generative AI or AI-assisted technologies were used in the writing of this manuscript

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