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NURSES RESPONSE TIME IN EMERGENCY HANDLING OF PATIENTS WITH HIGH PRIORITY CATEGORIES: A LITERATURE REVIEW

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ABSTRACT

Background: The patient mortality rate in the emergency department indicates the quality of patient care. One of the contributing factors is the nurse's response time in providing services to patients. Service delays can cause increased mortality in patients with high-priority categories. The purpose of this research is to identify how the response time of nurses in serving high-priority patients, the impact and causal factors, and strategies to improve nurse response time behavior. **Methods:** a systematic review using the PRISMA protocol and the JBI Critical Appraisal Tool was used to determine eligible articles. Articles were sourced from four electronic databases (Scopus, PubMed, Science Direct and Google Scholar). The inclusion criteria include research on the response time of nurses to patients in the emergency department, published in English in the last five years (2019 - 2023). **Result:** 19 articles were obtained according to the criteria. The analysis showed an increased risk of death in patients with the highest priority triage level, and an increase in response time positively impacted reducing the risk of death. Factors influencing response time behavior include age, gender, education level, length of work, knowledge, training, skills, self-efficacy, and work motivation. **Conclusion:** Efforts to increase response time are one factor in reducing the risk of death in patients with high priority. Strategies to improve nurse response time behavior in emergency services must consider factors influencing behavior to improve emergency services and reduce the risk of death.

Keywords: Nurses, Response Time, Emergency Department

INTRODUCTION

The mortality rate in the emergency department is one indicator of the quality of minimum service standards (Permenkes, 129/Menkes/SK/II/2008). In emergency services, the essential thing to note is the speed of nurses in responding or acting on the first patient who enters the emergency department to reduce the risk of mortality. This speed is often called response time (Jamal, Suartini and Budi, 2021). Response time is a combination of the response time when the patient arrives at the hospital door until he gets a response from the emergency department staff with the required service time until the emergency treatment process is complete (Maratur Silitomgo and Anugrahwati, 2021). Behavioral factors influence the hospital staff response time (Ngurah, 2016). A person's behavior is influenced by three factors: predisposing, enabling, and reinforcing factors. Predisposing factors include age, education, work, attitudes and knowledge. Enabling factors include the physical environment while reinforcing factors are

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leadership support, appreciation and regulation (Ngurah, 2016). Other research mentions predisposing factors, including age, gender, education, length of work, training, ability and motivation (Tartila, Wahyudi and Qona'ah, 2020).

Bandura (1997) reveals that people's belief in their abilities will influence how they respond to certain situations or conditions. A person's self-efficacy will affect the individual in determining an action or decision where the activity is carried out to achieve a goal (Irie, 2021). The results of other studies show that self-efficacy is the strongest predictor of creativity. It shows that higher self-efficacy can be associated with higher creativity (Pretz and Nelson, 2017).

Self-efficacy is essential in shaping behavior (Bandura, 1994, 1998). Self-efficacy will affect psychological processes within a person. High self-efficacy will improve thought processes and decision-making based on logical (cognitive) reasoning, motivate a person to take specific actions according to capacity (motivation), increase control of positive emotions (affective), and increase the ability to choose the right action according to certain conditions and circumstances (selective) (Bandura, 1994). The results of previous studies indicate that high self-efficacy can improve nurse performance (Kurniawan, Hariyati and Afifah, 2019). High self-efficacy will provide a perspective that complex tasks are challenges that must be faced and are not regarded as obstacles that must be avoided (Christensen-Salem *et al.*, 2021).

In an emergency, self-efficacy is vital because a person must work adequately and relatively quickly. It is related to the high stressor in the emergency department. Failure to manage the stressor can cause a loss in providing appropriate management. If someone only has knowledge and skills without high self-efficacy, they will make someone experience difficulties in making important decisions or specific actions in certain situations. (Bandura, 1994, 1998). The results of previous research stated that high self-efficacy can increase one's readiness to deal with emergencies and disasters (Zeth *et al.*, 2022).

Low self-efficacy will lead to low motivation, weak commitment and feeling unsure of their ability to achieve their goals. When doing complex tasks, they will overthink, think about their shortcomings, minimize effort, and choose to give up. Stressful emergency conditions can raise doubts in nurses in taking specific actions and, of course, cause an increase in response time. It can increase the risk of death (Zhang *et al.*, 2019; Wessman *et al.*, 2022). Based on some of the results of previous studies, the purpose of this research is to identify how the response time of nurses in serving high-priority patients, the impact and causal factors, and strategies to improve nurse response time behavior.

METHODS

This study uses a systematic literature review method. Searching and selecting articles used the Preferred Reporting Items Systematic Review and Meta-Analysis (PRISMA) protocol. Article quality is assessed by JBI critical appraisal. A literature search was conducted using various Scopus, PubMed, Google Scholar, and Science Direct databases on 25 April 2023 on articles published in 2019 – 2023, looking for studies determined through Medical Subject Headings (MeSH) and Boolean operators (AND, OR, and NOT). The keywords used are ("Response Time" OR "Response Latency" OR "Response Speed") AND ("Nurse") AND ("Emergency Departments" OR "Emergency Hospital Service" OR "Emergency Outpatient Unit" OR "Emergency Room" OR "Emergency Units" OR "Emergency Ward" OR "Hospital Emergency Service" OR "Hospital Service Emergency").

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Selection of inclusion and exclusion criteria using the PICOS strategy. The inclusion criteria are: 1) the article contains the results of research on Response Time in the Emergency Department; 2) results that explain the relationship between response time and risk of death; 3) cohort study and cross-sectional study design; 4) articles published between 2019 - 2023; and 5) articles written in English. The search has four stages: 1) identification: entering keywords in 3 databases; 2) screening: filtering the articles using inclusion and exclusion criteria; 3) eligibility: articles assessment using JBI. Critical Appraisal Tools by excluding articles below 50%; 4) included: relevant and eligible articles. Exclusion criteria were: 1) the article used literature review, systematic review, or scoping review; 2) duplication of publications on two or more journals. Data were analyzed using meta-synthesis.

RESULTS

The authors found 73,011 articles from all databases; Scopus = 450, PubMed = 54,606, Science Direct = 1,000 and Google Scholar = 17,000. Then screening was carried out using the PICOS inclusion and exclusion criteria and the JBI critical assessment; the results obtained were 19 articles that passed the screening.

Table 1 shows two research study designs: a cohort study and a cross-sectional study. The authors analyzed all research articles, and the results were obtained; the average respondent is an adult who experiences an emergency condition. The average Response Time that is measured is from the time of arrival until being transferred to the inpatient room. The time obtained varies from 1.3 hours – more than 8 hours. EDLOS 3 hours or more has a 37% increased risk of death (Davis, et al., 2021).

Likewise, the results of a study conducted by Lee KS, et al (2022) said that 25.3% of adult patients who entered the ICU through the emergency department experienced prolonged EDLOS of 3.3 hours or more, which was significantly associated with an increased risk of death in hospital. Of the 1487 perioperative patients waiting for surgery, with an average waiting time of 24.6 hours (12.5-53.2 hours), there will be an increased risk of death in patients (Montes, 2019). From the results of this study, it can be concluded that the longer the response time, the higher the risk of death.

DISCUSSION

One of the effects of patient mortality in the Emergency Department is the Response Time. Several research articles found that most response time measurements were carried out starting when the patient arrived at the Emergency department until the patient was transferred to an inpatient room, either a standard room or an intensive care unit. Response Time is a combination of the response time when the patient arrives at the hospital until a response from the Emergency department staff and the service time required until the emergency treatment process is complete (Maratur Silitomgo and Anugrahwati, 2021). The longer the Response Time in the Emergency Department, the risk will increase in the mortality rate, apart from the patient's condition where patients with a high level, namely priority 1, have a higher risk of death rate compared to those with a lower level (Jamal, Suartini and Budi, 2021).

The results of previous research stated that there was a relationship between education, length of work, and training with response time (Mudatsir, Sangkala and Setyawati, 2018; Saktiawati, Silvah and Ilham, 2021). However, the results of other studies state that there is no relationship between age, education, length of work, training, expertise, motivation with response time. Factors related to response time were gender and appreciation (Tartila, Wahyudi and Qona'ah, 2020). High education, length of work, training and

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competency possessed by a person will increase a person's confidence in taking action, including Response Time. Someone will make an effort based on experience and competence possessed. More expertise and higher competence will increase self-confidence. The relationship between caring preceptor, self-efficacy, job satisfaction, and new nurse performance (Kurniawan, Hariyati, and Afifah (2019).

Improving the response of the nursing team in the emergency department is one of the efforts to reduce mortality. Response time behavior changes: immediately go to the patient, conduct an assessment to find out the patient's problem and take action immediately according to his needs influenced by a person's self-efficacy. Self-efficacy is confidence in his ability to do something to achieve success (Irie, 2021).

The concept of self-efficacy is divided into three dimensions: magnitude, generality, and strength (Bandura, 1998). Magnitude is the level of self-efficacy of each individual in working on and completing a task that will differ from one another, depending on the task's difficulty level. Someone will have high self-efficacy if they do jobs that are relatively simple and easy for themselves and according to their abilities. The second dimension is generality; this dimension has a relationship with the skills possessed by a person in working on the field or something he is working on. They have self-efficacy in various activities or are limited to certain things. Someone with high self-efficacy will find it easier to master multiple fields to complete the job. The third dimension is strength; this dimension focuses more on a person's strength level toward his beliefs. Self-efficacy will tell someone that all their actions and work will produce results that match their expectations (Bandura, 1994, 1998).

High Self-Efficacy tends to intervene immediately in carrying out their duties. They do not perceive their task or work as a burden or threat to them and choose to develop a passion for an activity to achieve their goals. If they experience failure, they will quickly get up and get their self-efficacy back, thinking that a loss is a form of effort that has yet to be maximized. Meanwhile, someone who has low Self-Efficacy tends to procrastinate and even avoid the work or task they carry out. They consider that the job is a burden and a threat to them. Low self-efficacy will lead to low motivation, weak commitment and feeling unsure of their ability to achieve their goals. When doing complicated tasks, they will overthink, think about their shortcomings, minimize effort, and choose to give up (Bandura, 1994, 1998).

Therefore, high self-efficacy will increase officers' response time and performance in responding quickly to incoming patients. Good Response Time behavior will affect good clinical management and ultimately reduce mortality. However, the right strategy by making good preparation through training and conditioning for the situation with guidance from other nurses who are more proficient, as well as a supportive environment must be carried out correctly (Saktiawati, Silvah and Ilham, 2021; Cevik *et al.*, 2022), and there was a significant relationship between self-efficacy and nurse preparedness in facing the disasters (Zeth *et al.*, 2022).

CONCLUSION

Nurse response time behavior, especially in priority 1 category patients, is influenced by many factors, including age, gender, education level, length of work, knowledge, training, skills, self-efficacy, and work motivation. Self-efficacy plays a key role, where high self-efficacy will increase response time. Improving response time can be done through efforts to increase self-efficacy to improve hospital staff in responding to patients quickly and taking appropriate action, increasing good clinical management so that it can reduce patient mortality.

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Figure 1. Prisma flowchart

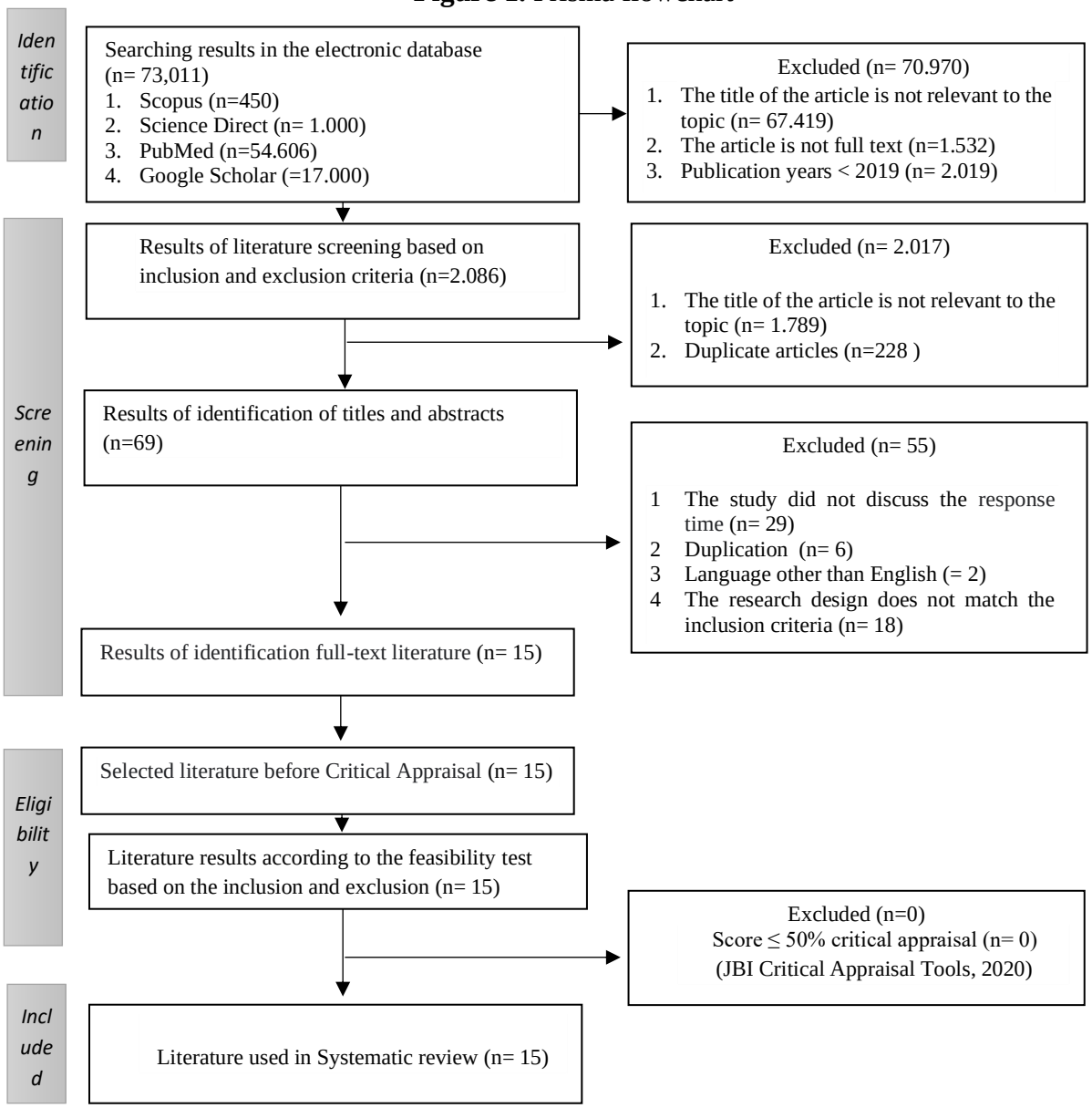

Figure 1. Diagram of Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA)

Table 1. Characteristics or summary of findings from articles

No	Author (years)	Method	Main Findings
1	Stey *et al.* (2021)	D: Observational cohort study S: 113 respondents V: ED length of stay I: The data ACS-TQIP 2010-2015. A: chi-square test and continuous non-parametric variables using the Mann-Whitney test	One hundred thirteen patients from 373 hospitals were identified as having unintentional or intentional traumatic injuries and were considered critically injured on admission to the ICU with an ISS more significant than 15. The median length of stay in the ED was 167 minutes, with an interquartile range of 91-269 minutes. Prolonged length of stay in ED occurred in 15,279 (13.5%) patients. The mortality rate of patients with prolonged LOS IGD is 4.5%, almost the same as the control group, which is 4.2%. The results of multivariable logistic regression showed that prolonged length of stay in the emergency department was not associated with mortality.
2	Wessman *et al.*(2022)	D: Retrospective cohort study S: 639 respondent V: patient's main complaint, triage priority, pre-hospital care I: RETTS-A Triage priority A: Pearson's test and one-way ANOVA	The highest mortality occurred at the highest and decreased at the lower triage levels. Increased LOS in the ED is associated with a slight increase in short-term mortality in patients at lower triage levels and those not admitted to the hospital.
3	Davis *et al.* (2021)	D: Cross-sectional retrospective analysis. S: 3108 respondent V: System characteristics (hospital stroke certification), patient characteristics (age, sex, and race), and covariate conditions (stroke severity and comorbidities) I: administrative database A: descriptive statistics dan hierarchical logistic regression models	Mean EDLOS was 2.9 ± 3 hours (0–42 hours). Inpatient mortality is 14.9%. EDLOS 3 hours or more has a 37% increase in the odds of in-hospital mortality
4	Ha and Sung (2022)	D: Retrospective observational study. S: 227 respondent V: Age, sex, initial vital signs, state of consciousness, past medical history, EDLOS I: CURB-65 score, acute physiology and chronic health evaluation II, and sequential organ failure assessment scores were calculated and compared. A: Mann–Whitney U test; Multivariate logistic regression	The analysis showed that post-EDLOS (waiting time in the emergency room after deciding to enter the ICU) was an independent risk factor for death in the hospital for patients with pneumonia who were treated in the ICU. Mid-EDLOS (waiting time in the ED for reviewing, dining, and making decisions about patient admission to the ICU) is an independent risk factor for death in hospitals for pneumonia patients treated in the ICU during the COVID-19 pandemic.
5	Lee *et al.* (2022)	D: Retrospective cohort study S: 657,622 respondent V: ED presentation, initial triage score, artificial ventilation in the ED, diagnosis codes during hospitalization I: Charlson comorbidity index (CCI) and discharge status. A: Chi-squared test; Wilcoxon rank test	The median EDLOS is 3.3 hours. Characteristics of patients associated with prolonged EDLOS are coming to the emergency room at night and a Charlson comorbidity index (CCI) score of 1 or higher. While the characteristics of the hospital are a larger number of staffed beds and a higher level of emergency department. 25.3% of adult patients were admitted to the ICU. through the ER experience prolonged EDLOS, which is significantly associated with an increased risk of in-hospital mortality
6	Harpenau *et al.* (2022)	D: Retrospective cohort study S: 128 respondent V: ED LOS <6 and ED LOS ≥ 6 hours, I: Electronic reporting of patients admitted to the ED with a diagnosis of sepsis or septic shock, the random number generator selected a total of 490 patients for eligibility review, 362 (74%) of whom were excluded, reasons for exclusion included qSOFA < 2 (n = 268) and the first dose of antibiotics not administered within 3 hours. A: Chi-squared test.	There were 128 patients, 99 with EDLOS <6 hours and 29 with EDLOS ≥6 hours. Delay in the second dose of antibiotics occurred in 30.3% of patients with EDLOS <6 hours and 24.1% with EDLOS ≥6 hours. In-hospital mortality in patients with delayed second doses of antibiotics was more significant than those without delay (18.9% vs. 8.8%).
7	Zhang *et al.* (2019)	D: Retrospective study S: 1997 respondent V: Sociodemographic, comorbidities, vital signs, and laboratory results, EDLOS I: EDLOS duration A: Student's t-test, Mann-Whitney test, Fisher's exact test, multivariable regression model	The mortality rate of patients with EDLOS <6 hours was 21.4%, EDLOS 12-24 hours 31.9%, and EDLOS >24 hours 31.8%. Prolonged EDLOS was independently associated with an increased risk of death in septic patients admitted to the ICU from the ED.

No	Author (years)	Method	Main Findings
8	Montes *et al.* (2019)	D: Retrospective cohort study S: 1487 respondent V: ED-LOS, the interval between ED arrival and surgery start time and Mortality I: Electronic medical records were the primary data source at both hospitals A: Student's t-test or Mann-Whitney test, Wilcoxon, Chi-square test or Fisher's exact test	Among 1487 patients analyzed, 519 adverse perioperative outcomes were reported, including 150 deaths. In the unselected sample (n = 998), 17.9% of patients presented a negative perioperative outcome with a mortality of 4.9%. The median ED-LOS was 24.6 (IQR 12.5–53.2) hours. ED-LOS was associated with age, comorbidities and known risk factors for 30-day mortality. Patients developing an adverse perioperative outcome started surgery 27.1 h later than their counterparts. Prolonged ED-LOS increased the risk of a negative perioperative effect in patients without risk factors (covariate-adjusted OR = 2.52) while having 1–2 or 3+ risk factors was negatively associated (OR = 0.87 and 0.72, respectively, p < 0.001 for the interaction).
9	Asheim *et al.* (2019)	D: Cohort study. S: 80.617 respondent V: Instrumental; the average time to triage in minutes. Patients triaged I: Rapid Emergency Triage and Treatment System A: multiple linear regression	The mean EDLOS was 2.9 hours, and the risk of death at 30 days was 3.4%. There is almost no change in the risk of death due to prolonged EDLOS.
10	Dinh *et al.* (2023)	D: Retrospective analysis. S: 697.600 respondents V: Time of ED presentation, Triage category, Charlson Comorbidity Index score, Readmission within 30 days, All-cause mortality. I: Charlson Comorbidity Index score A: Multiple linear regression	The 30-day mortality ratio is 28% higher in patients with prolonged EDLOS (do not meet ETP.)
11	Boulain, Malet and Maitre (2020)	D: Retrospective longitudinal cohort study S: 68.632 respondents V: Boarding time in the ED I: ED boarding time A: Wilcoxon Sign Rank test	17,271 (25.2%) had ED boarding time >4 hours. There is a significant increase in the risk of death in patients with ED boarding time >4 hours. LOS in the hospital was also significantly longer in patients with ED boring time >4 hours
12	Groenland *et al.* (2019)	D: Retrospective observational cohort study S: 14,788 respondents V: age, male, gender, predicted mortality I: APACHE IV A: Variance or Kruskal-Wallis test	The median time from ED to ICU was 2 hours (1.3-3.3 hours). Prolonged time from ED to ICU. (>2.4 hours) is associated with increased hospital mortality after ICU admission. The sooner the patient enters the ICU, the lower the hospital mortality.
13	Tartila, Wahyudi and Qona'ah (2020)	D: Cross-sectional study S: 101 respondents V: Independent variables are skills, emergency training, gender, age, working length, education, rewards, and motivation. The dependent variable is response time. I: Questionnaire A: Multiple Regression Logistic test	There is no relationship between age, education, length of work, training, expertise, and motivation with response time. There is a relationship between gender and the reward factor with response time.
14	Mudatsir, Sangkala and Setyawati (2018)	D: Cross-sectional study S: 32 respondents V: Level of education, emergency training, facilities, patient emergency level, length of work, patient treatment time. I: Questionnaire A: Chi-square, Fisher's extract test dan multiple logistic regression	This study found that there was statistical significance between response time and level of education (p = 0.006), length of service (p = 0.005), emergency medical training (p = 0.001), ED facility (p = 0.008) and patient's level of acute condition (p = 0.006). Among these factors, the facility factor was the most related to response time (OR = 6.945). There is a relationship between the level of education, length of work, emergency training, IRD facilities, and the patient's emergency level with the response time for treating head-injured patients.
15	Saktiawati, Silvah and Ilham (2021)	D: Cross-sectional study S: 60 respondents V: Gender, length of service, education, training, response time I: Questionnaire A: Fisher's test and correlation	The results showed that there was a relationship (p-value < 0.034) between education (p = 0.05), years of service (p = 0.016), training (p = 0.034) and nurse response time. There is a relationship between education, length of work, and training with response time.