

## Nurses response time for trauma patients in the emergency department

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### Abstract

**Background:** In emergency conditions, patients can lose their lives in a matter of minutes, so a fast response time is needed from emergency room staff. This study aimed to determine the description of nurse response time in trauma patients at the Emergency Department.

**Method:** This research was a quantitative research used a descriptive observational method. The population was 40 executive nurses at the Emergency Department. The sampling technique used total sampling with a sample size of 26 executive nurses. The data analysis used frequency distribution. The instrument used a response time observation sheet to record the time from the patient's arrival at the emergency room until getting initial treatment.

**Results:** The response time of nurses in trauma patients was in a fast category ( $\leq 5$  minutes) as many as 19 respondents (73,1%), and in the slow category ( $> 5$  minutes) as many as 7 respondents (26,9%).

**Conclusion:** Most of nurses respon time was in fast category. It is hoped nurses can maintain response time quickly ( $\leq 5$  minutes) and precisely by applicable Standard Operational Procedural (SOP). Additionally, nurses can continue to improve skills through emergency department training.

**Keywords:** Emergency Department; Nurses; Response Time; Trauma

### INTRODUCTION

The Emergency Department (E.D.) is a service unit in the hospital that provides services to people who experience acute illness or trauma by established standards that have been set. Patient division based on class and severity condition is very important to prevent disability and death in patients (1). Therefore, in carrying out emergency services, it is necessary to provide good integrated treatment from multi-disciplines and multi-professions including nursing services (2).

The majority of frequent cases in the emergency room are trauma and non-trauma. Trauma as defined by the American Heritage Dictionary is an injury, especially one caused by a sudden physical injury (3). Trauma is divided into blunt trauma, sharp trauma, heat trauma, and chemical trauma.

Africa's traffic injury death rate is 32.2 per 100,000 population, double that of the Americas. The rate is projected to increase

from 1.2 million in 2002 to 1.9 million in 2030. In Ghana, the trauma mortality rate is estimated at 80-100 per 100,000 patients annually, 50% greater than the rate in developed countries (4).

The incidence of trauma according to WHO data in 2015 stated that 4.7 million injury deaths occurred worldwide, accounting for 8.5% of all deaths, of which almost 90% were experienced in low and middle-income countries. For this reason, there is a need to improve the efficiency and quality of trauma patient care, as well as improve the quality of emergency nursing services for trauma patients in prioritizing interventions and facilitating evidence-based decision-making, policy planning, and the development of better trauma care system better trauma care systems. The very high mortality rate can certainly be reduced by optimizing emergency care in trauma cases that hit the community (4).

In Indonesia alone, traffic accidents are the most common type of trauma, followed by workplace injuries. Based on Basic Health Research (RISKESDAS) shows the percentage of head injury cases is 11.9%, with the highest highest percentage in Gorontalo at 17.9% and Jambi Province at 4.5% (5).

A trauma emergency can happen anytime, anywhere, and to anyone. The speed and accuracy of help in a trauma emergency will determine the outcome of the help provided. Trauma patient care in the Emergency Department begins the first time the patient is admitted by performing triage, followed by the provision of management in accordance with the trauma patient's emergency category (4).

Trauma patients require immediate action, as red triage indicates, which has first aid priority due to their serious condition, with a waiting time of 0-5 minutes. It is because patients can lose their lives in just minutes. In humans, respiratory arrest for 2-3 minutes can be fatal (6).

The need for appropriate and efficient response time efficiency plays an important role in every decision-making process from the time the patient arrives until the patient is transferred from the emergency room (6). Improving response time can improve the quality of quality of care, prevent further disability, and reduce the risk of death. Response time delays due to the unavailability of equipment or medication will impact the patient's life expectancy. Long response times are associated with an increased risk of mortality (7).

The high number of medical emergencies that occur requires the entire emergency room medical team to have good abilities and skills in the field of emergency (3). Based on the decree of the Minister of Health of the Republic of Indonesia number 856/Menkes/SK/IX/2009 concerning the minimum service standards of hospitals, hospital minimum service standards state that emergency patients must be treated no later than 5 (five) minutes after arriving at the emergency room (8). Timeliness in performing emergency services in terms of

the implementation of the action or examination is started by doctors and nurses in less than 5 minutes from the first time the patient arrives in an effort to minimize the response time of the delay in service (9).

Emergency patient management has a philosophy of "Time Saving is Life Saving"; that is, all actions must be effective and efficient (10). The need for appropriate response time and efficiency plays a vital role in every decision, from when the patient arrives until the patient is transferred from the emergency department (11).

However, response time can be affected by several things, including the number of personnel, facilities and infrastructure, and knowledge or experience of the nurse. Nurse response time is said to be on time if it is within the average time that has been determined (12). It can be concluded that response time is the speed and accuracy of the time service requires the patient to get help in accordance with the emergency of the disease since entering the emergency room door (9).

Based on research conducted by Afrina et al., the number of samples in the study were 30 respondents. This study shows that nurses with poor response time in patients with second priority amounted to 6 (66.7%) people, more than nurses with poor response time with first priority patients. While nurses with good response time with first priority patients amounted to 16 (76.2%) people. It can be concluded that the response time in the emergency room of Bakti Timah Pangkalpinang Hospital is included in the excellent category (13).

Based on research by Avidar et al, it shows that patients with trauma categories including fast response times are 35 patients and 6 patients are slow with an average medical personnel response time of 6.244 minutes. Patients with non-trauma categories including fast response times were 161 patients and 42 patients were slow with an average medical personnel response time of 3.722 minutes (3).

Based on research by Rossy et al, it shows that in the response time group of 69 respondents, it is calculated from the time

the patient arrives at the emergency room until he is handled by medical staff. 50 patients with a percentage of 72, 5% get a fast response time, which is handled  $\leq$  5 minutes after the patient arrives at the hospital. The remaining 19 patients with a percentage of 27.5% were treated  $\geq$  5 minutes after arriving at the hospital or did not meet service standards. The average response time obtained is 4 minutes 7 seconds (14).

Various research studies conducted in Indonesia regarding response time still show varied results, and no research has been found on the response time of nurses in trauma patients at Jambi Provincial Hospital.

This study aims to determine the nurse's response time for trauma patients in the trauma patients in the Emergency Department.

**METHOD**

This research used quantitative methods, using the descriptive observational method. It was conducted in February 2024 at the Emergency Department of Raden Mattaaher Hospital Jambi.

The sampling technique used total sampling, with a sample size of 26 nurses who met the inclusion and exclusion criteria. Inclusion criteria in this study were an executive nurse who is on duty in the emergency department and nurses in trauma cases from triage to initial treatment. Exclusion criteria in this study were nurses who served as head of the room or team head and who were on leave.

This study was analyzed univariately, namely frequency distribution. The instrument used was a response time observation sheet to record the time from the patient's arrival at the emergency room until the patient gets initial treatment from the nurse. The measuring instrument used was a stopwatch to measure nurse response time. The measurement results were  $\leq$  5 minutes, including response time in the fast category, and measuring results  $>$  5 minutes, including the slow response time category.

The implementation of this study has been approved by the Health Research

Ethics Commission (KEPK) Raden Mattaaher Hospital Jambi by procedures applied with ethical number S.118/SPE/I/2024.

**RESULTS**

**Table 1. Frequency Distribution Characteristics of Respondents**

Variable	f	%
<b>Gender</b>		
Male	11	42,3
Female	15	57,7
<b>Total</b>	<b>26</b>	<b>100.0</b>
<b>Age</b>		
< 25 years	9	26,9
26-35 years	12	46,2
36-45 years	4	15,4
45-55 years	3	11,5
<b>Total</b>	<b>26</b>	<b>100.0</b>
<b>Education</b>		
Nursing Diploma	15	57,7
Nursing Bachelor	11	42,3
<b>Total</b>	<b>26</b>	<b>100.0</b>
<b>Length of work</b>		
<5 years	13	50,0
6-10 years	9	34,6
11-15 years	2	7,7
16-20 years	2	7,7
<b>Total</b>	<b>26</b>	<b>100</b>

Based on Table 1, it can be seen that most nurses are female, with a total of 15 respondents (57.7%). Most respondents were aged 26-35 years, with 12 respondents (46.2%). The majority of nurses with vocational education (diploma) were 15 respondents (57.7%). Nurses' work length is dominated by nurses who work  $<$ 5 years, with as many as 13 respondents (50.0%).

**Table 2. The Frequency Distribution of Nurses Response Time**

Variable	Frequency	(%)
Fast ( $\leq$ 5 minutes)	19	73,1
Slow ( $>$ 5 minutes)	7	26,9

Table 2 shows that the distribution of nurse response time from 26 respondents obtained response time in the fast category from as many as 19 respondents (73.1%) and response time in the slow category from as many as 7 respondents (26.9%).

## DISCUSSION

Based on the study results, most nurses' response time is in the fast category. Based on the characteristics of respondents, this study was dominated by female nurses. This is in line with previous research that in Indonesia the majority of health workers are dominated by women. Women are said to be synonymous with feminism. This attitude that women have is very helpful in providing nursing care because it is related to the application of the concept of caring and communication to patients (15).

In this study, the majority of nurses aged 26-35 years, based on the results of research at RSUD Tugurejo Semarang, there was no relationship between age and performance of nurses because poor performance is not necessarily caused by age. Nursing services must pay attention to physical and mental health, workability, and high responsibility (16).

Age has a close relationship with a person's productivity and level of technical and psychological maturity. The higher the age may indicate that life and work experience are already quite a lot. Productive age has a positive impact that helps nurses always work and provide the best so that nursing services are of higher quality (17).

In this study, the education level of nurses is dominated by Diploma Nursing graduates. The education possessed by nurses will have an impact on the nursing services provided to patients, including emergency department response time. The level of education is one of the factors that influence a person's perception and more easily accept ideas and technology. The higher the level of education, the more knowledgeable a person will be, which leads to a better quality of life (18).

Nurses with length of service <5 years dominated in this study. Period of work can affect the nurse's response time; it can happen because the working period can increase experience, skills, and knowledge because nurses directly face cases of emergencies so that they will be more proficient in taking action (19).

Nurses with a new tenure tend to be highly idealism in nursing care, which tends to be an opportunity to show good performance because it is beneficial for career development as a nurse (19). The length of service of the nurses on duty is closely related to the length of work and experience they have when working in the previous installation, fresh graded nurses still need guidance and basic training for emergencies that enter / seek treatment at the Grandmed Hospital Emergency Room Installation in accordance with triage grouping and response time according to Grandmed Hospital policy (19).

Based on the researcher's observation results, after the patient arrives at the emergency room door, the nurse will immediately direct the patient to the medical room for an anamnesis. The nurse's response time was less than 3 minutes until triage. However, inpatient conditions in the yellow triage category will be temporarily handled, and delays will be carried out because the nurse will handle them based on the patient's triage group and the severity of the patient's condition.

This is in line with the results of research by Hania which state that there is a relationship between the condition of emergency patients (red triage) and response time. Nurses prioritize severe patient conditions over mild patient conditions and can even affect response time five times that of mild patient conditions (7).

This is in line with Afrina et al's research which states that traffic accident patients with priority one status (red) will be prioritized in emergency nursing services and will get a faster response time compared to traffic accident patients with second priority (yellow and green). This is because if priority one patients do not get management first, it will increase the likelihood of morbidity and mortality in patients. In accordance with the IGD motto time is saving, the safety of priority one patients is highly dependent on the timing of management (13).

In this study, based on the results of observation, rapid response time in trauma

cases is dominated by trauma cases were dominated by patients with mild head injuries caused by traffic accidents and patients not wearing helmets when driving, with a total of 12 cases with an average response time of 4.30 minutes. This is because patients with mild head injury cases are not given too many actions.

Based on researcher observations, patients with red triage have a fast response time, such as cases of severe head injury and vulnus laceratum who presented with severe because, in this case, the patient is in an emergency that requires immediate action to prevent as soon as possible to prevent disability to the patient. Slow response time is more dominated by trauma cases with yellow and green triage categories; in this study, cases classified as yellow triage, such as cases of vulnus laceratum (lacerated wounds), vulnus scissum (cut wounds), closed fractures, and burns with an average response time of 16.2 minutes. In patients who are included in the yellow category or patients who are the second priority (action area), action can be postponed to patients where there is no life threat that can occur at any time to the patient (20).

This research is in line with the research of Prahmawati et al who shows the results of univariate analysis of known respondents who get a fast response time <5 minutes 35 respondents (58.3%) and respondents who stated that the service in the emergency department was fast who stated that service in the emergency department in the excellent category 33 respondents (55%) (10).

This study is in line with Suswitha et al's research on the response time of head injury services to patients at the Palembang Hospital Emergency Room, where most nurses had a response time of <5 minutes, as many as 94.9%(12).

Based on researcher observations, the thing that affects the slow response time of nurses in trauma cases is the increasing number of patient visits at one time, which can cause delays in handling time because the number of nurses on duty in one shift is only 7-10 people. The high number of patient

visits at one time resulted in a decrease in bed capacity in the emergency room and a limited number of nurses, requiring patients to wait temporarily and delayed action.

This research is also in line with Wisageni et al. about the "Relationship between Nurse Response Time and Satisfaction Level in Category Patients Australian Triage Scale (A.T.S.)" that a small proportion of respondents stated that the response time of health workers is slow, this is related with the limited number of health workers in providing services, while the tasks of the task that are carried out so much that affect the availability of health workers in the response time (21).

In addition to improving facilities and infrastructure, human resource development and integrated multi-disciplines and professions also need to improve commitment and unity of perception about the principles of triage principles for all health workers in the emergency room environment as well as for patients. Patients with severe severity are expected to respond faster than those with mild light severity. Information related to patient management based on triage needs to be shared with patients in general (with counseling /seminars, posters, leaflets, etc.) and personally (by being informed directly / in person) (22).

A long response time can be fatal for patients in the form of physical disability and cause disappointment and dissatisfaction with family and patients towards the services offered by the hospital. So, response time affects the level of patient life safety when patients come for treatment in the emergency room and affects the quality of hospital services .

Limitations in this study include the possibility of bias that is not realized by the researcher, as nurses may know they are being assessed in terms of performance, which can lead to unrealistic results.

## CONCLUSIONS

Based on the results of research conducted by researchers regarding the response time of nurses to trauma patients in

the Emergency Department Raden Mattaher Hospital Jambi, it can be concluded that the response time at the Emergency RSUD Raden Mattaher Jambi in the category fast ( $\leq$  5 minutes).

It is expected that nurses can maintain response time quickly ( $\leq$  5 minutes) and precisely by the applicable Standar Operational Procedural. Moreover, nurses can continue to improve skills through emergency department training.

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