



## ANALYSIS OF KNOWLEDGE AND NURSE COMPETENCIES RELATED TO ADVANCED CARE FOR TRAUMA PATIENTS IN THE EMERGENCY ROOM IN SOUTH SULAWESI

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### ABSTRACT

**Introduction:** The Emergency Room is a unit that provides initial treatment for trauma patients. Trauma cases contribute to disability and suffering, making it the fourth leading cause of death worldwide. In 2021, the prevalence of trauma-related deaths was approximately 4.4 million people globally, with 8% of cases resulting in death. This phenomenon highlights the importance of health workers, possessing specialized knowledge and competence in emergencies, including triage, primary, and secondary assessment. **Objective:** The purpose of this study is to analyze the relationship between knowledge and nurse competence in providing follow-up care for trauma cases at the ER in South Sulawesi. **Method:** The research method utilized in this study is quantitative, employing a cross-sectional approach with a total sample of 37 respondents selected through the total sampling technique. The research was conducted at Ibnu Sina Hospital and Bayangkara Hospital in Makassar. Data were collected through questionnaires and competency observation sheets, and subsequently tested using a correlation test. The results of the univariate test indicate that nurses possess good knowledge in various aspects of follow-up care, including triage, primary survey, and secondary survey. Additionally, their competencies in these areas are also well-developed. **Result:** The correlation test revealed significant relationships between knowledge and triage competence (p-value of 0.01), knowledge and primary survey competencies (p-value of 0.047), as well as knowledge and secondary survey competencies (p-value of 0.04). These findings suggest that a higher level of knowledge among Emergency Room nurses regarding follow-up care corresponds to better competence in managing trauma cases in the emergency room. **Conclusion:** it can be concluded that there exists a relationship between nurses' knowledge regarding follow-up care and their competence in three aspects: triage, primary survey, and secondary survey. Based on these findings, it is recommended that nurses can enhance their competencies through training and can apply high-quality cardiopulmonary resuscitation to improve patient safety.

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## 1. INTRODUCTION

Emergency Room Instalation is the hospital sector that provides prompt, accurate, and careful first aid services to emergency patients in order to prevent death or disability. The Emergency Room provides initial treatment for patients suffering from illness and injury, which can be life-threatening. It requires a timely and efficient response time from the moment the patient arrives until initial treatment is provided (Pira, dkk., 2021).

Speed and accuracy of assistance in trauma emergencies greatly determine the outcome of the provided aid. Assistance for trauma patients in the Emergency Room begins upon prioritizing patients through triage, followed by providing appropriate treatment based on the severity of the patient's condition (Fatriani et al, 2020).

According to the World Health Organization, there are several diseases considered as emergencies and leading causes of death worldwide, including ischemic heart disease 7.4 million (13.2%); stroke 76.7 million (11.9%); chronic obstructive pulmonary disease 3.1 million (5.6%); lower respiratory tract infections 3.1 million (5.5%); and cancer 1.6 million (2.9%). Injury or accidents cases result in a death toll of 1.2 million. In 2016, there were a total of 18,250,250 visits to the Emergency Room (13.1% of the total visits), and this significant number requires significant attention in providing emergency patient care (Pira et al. 2021).

Trauma remains a public health issue and contributes to disability and suffering. In 2021, approximately 4.4 million people worldwide die each year due to trauma, which accounts for nearly 8% of all deaths. Unintentional trauma claims the lives of 3.16 million people annually, while violence-related trauma kills 1.25 million people each year (WHO, 2021).

According to WHO data in 2022, it is recorded that 1.3 million people worldwide die each year in road accidents due to trauma. Trauma is the leading cause of death for individuals aged 5-29 years. Efforts need to be made to improve the efficiency and quality of assistance provided to trauma patients, as well as enhance the quality of emergency nursing care for trauma patients in determining intervention priorities and facilitating evidence-based decision-making, policy planning, and the development of a better trauma care system (Fatriani et al. 2020).

Data from the Basic Health Research (Riskesmas) 2013 revealed that injury cases in Indonesia still rank as the fourth leading cause of death, but among the age group of 15-25 years, it is the primary cause of death. The national prevalence of injuries in 2007 was 7.5%, which increased to 8.2% in 2013. The highest prevalence was found in South Sulawesi (12.8%), followed by DIY (12.4%), and the lowest in Jambi (4.5%). Based on Riskesdas data in South Sulawesi in 2018, the distribution of injury victims by region was as follows: head injuries (15.02%), chest injuries (2.77%), back injuries (6.63%), abdominal injuries (2.26%), upper limb injuries (32.36%), and lower limb injuries (65.56%) (Kemenkes RI, 2018).

The high number of deaths and trauma in the emergency room (ER) is caused by several factors, such as inadequate adherence to Standard Operating Procedures (SOP), delays in handling, and the calculation of the time from patient arrival to treatment. The ideal response time for patients is less than 5 minutes. In the management of emergency patients in the IGD, there is a philosophy of "Time Saving is Life Saving," which means that time is life, and every action taken in emergency conditions must be effective and efficient. In line with research by Pira et al. (2021) which identified that out of 60 respondents, nurse response time was <5 minutes (58.3%) and services in the ER were in the good category (55%).

Based on the presentation of the phenomenon and prevalence data of trauma cases above, patient deaths in the emergency room due to trauma cases are relatively high. Therefore, the researcher is interested in conducting a study on the Analysis of Nurse Competence Related to Advanced Care for Trauma Patients in the Emergency Unit in South Sulawesi.

## 2. METHODS

### Research Design

This type of research is a quantitative study using the descriptive analytic method with a cross-sectional approach. The purpose of this study is to analyze the relationship between nurse competence in providing follow-up care for trauma cases at Ibnu Sina Hospital and Bhayangkara Hospital in Makassar.

### Population and Sample

Total sampling adalah teknik pengambilan sampel di mana jumlah sampel sama dengan populasi. The population in this study consists of nurses from the Emergency Department of Ibnu Sina Hospital and Bhayangkara Hospital Makassar, totaling 38 nurses. The sampling technique used in this study is the total sampling method. Total sampling is a sampling technique where the sample size is equal to the population size.

### Instrument

In this study, the instrument used for data measurement is a knowledge questionnaire in the form of a *Google Form* with multiple-choice answers. The questionnaire consists of 10 questions about triage, 26 questions about the primary survey, and 10 questions about the secondary survey. Competence is measured using an observation sheet in the form of a checklist consisting of 15 statements. The validity test of the questionnaire yielded a value of  $r < 0.3610$ , and the reliability test showed a Cronbach's alpha value with a result  $> 0.6$ .

### Research Procedure

In this study, data collection was done using a knowledge and competency questionnaire that has undergone validity and reliability testing using *Google Form*. Nurses filled out the research consent form with informed consent and were given approximately 15 minutes to complete the form. Respondents' answers were collectively gathered in Google Spreadsheet. The data obtained from the questionnaire was then directly validated by the researcher using an observation sheet to assess the nurses' competence in providing advanced care to trauma patients. The duration required to observe respondents was approximately 15-20 minutes.

### Data Analysis

The data analysis stage is divided into two stages, namely univariate and bivariate analysis using SPSS version 24. Univariate analysis is used to assess the characteristics of respondents, the knowledge of triage, primary assessment, and secondary assessment related to advanced care in trauma cases at the Emergency Department of Ibnu Sina Hospital and Bhayangkara Hospital

Makassar. Bivariate analysis in this study aims to determine the relationship between knowledge and competence related to advanced care in trauma cases using correlation tests to examine the relationship between two nominal categorical variables.

### Ethical Clearance

This research has obtained ethical approval from the Ethics Committee of the Faculty of Medicine and Health Sciences, Alauddin State Islamic University Makassar, with letter number: C.144/KEPK/FKIK/II/2023.

### 3. RESULT

Based on the results of the statistical rank-spearman test, there is a significant correlation between nurse knowledge and competencies related to the primary survey in trauma cases at Ibnu Sina Hospital and Bhayangkara Hospital Makassar. The test result shows a p-value of  $0.047 < 0.05$ , indicating that nurse knowledge and competencies related to the primary survey in trauma cases have a meaningful correlation with an r value of 0.416. Similarly, there is a significant correlation between nurse knowledge and competencies related to the secondary survey in trauma cases at Ibnu Sina Hospital and Bhayangkara Hospital Makassar. The test result shows a p-value of  $0.041 < 0.05$ , indicating that nurse knowledge and competencies related to the secondary survey in trauma cases have a meaningful correlation with an r value of 0.337. Therefore, it can be concluded that the null hypothesis ( $H_0$ ) is rejected, and the alternative hypothesis ( $H_a$ ) is accepted, meaning that "the higher the level of knowledge, the higher the nurse's competency related to triage, secondary survey, and primary survey in trauma cases.

**Table 1. Characteristics of Respondents**

	Frekuensi	Persentase (%)
<b>Gender</b>		
Woman	20	54,1
Man	17	45,9
<b>Age</b>		
26-35 years old	27	73,0
36-45 years old	10	27,0
<b>Education</b>		
Diploma Degree (D3)	11	29,7
Bachelor's Degree (S1+Ners)	25	67,6
Master's Degree (S2)	1	2,7
<b>Training</b>		
Yes	28	75,7
No	9	24,3
<b>Length of Work</b>		
> 10 years old	20	54,1
< 10 years old	17	45,9
<b>Total</b>	<b>37</b>	<b>100</b>

Based on the above table, the characteristics of the respondents who contributed to this study are as follows: In terms of gender, there were 20 female respondents (54.1%) and 17 male respondents (45.9%) who contributed to this study. The characteristics of the respondents based on age are as follows: 27 respondents (73.0%) were in the early adulthood category (26-35 years

old), and 10 respondents (27.0%) were in the late adulthood category (36-45 years old). The characteristics of the respondents based on their highest education are as follows: 11 respondents (29.7%) had a Diploma Degree (D3), 25 respondents (67.6%) had a Bachelor's Degree in Nursing (S1/Profesi Ners), and 1 respondent (2.7%) had a Master's Degree (S2). In terms of training experience, 28 respondents (75.7%) had participated in emergency-related training, while 9 respondents (24.3%) had not participated in any emergency-related training. Based on the period of working at emergency room of Ibnu Sina hospital and RS Bhayangkara hospital, 20 respondents (54.1%) had worked for more than 10 years, and 17 respondents (45.9%) had worked for less than 10 years.

### Nurse Knowledge Regarding Triage, Primary Survey, and Secondary Survey

**Table 2. Nurse Knowledge in the Emergency Department Regarding Triage, Primary Survey, and Secondary Survey Advanced Care of Trauma Patient at Ibnu Sina Hospital and Bhayangkara Makassar Hospital (n=37)**

Knowledge Level	Frequency	Percentage (%)
<b>Triage</b>		
Quite Good	17	45,9
Good	20	54,1
<b>Primary Survey</b>		
Quite Good	16	43,2
Good	21	56,8
<b>Secondary Survey</b>		
Quite Good	14	37,8
Good	23	62,2

Based on table 2, the description of the knowledge of emergency room nurses at Ibnu Sina Hospital and Bhayangkara Hospital Makassar regarding trauma patient triage falls into the good category. There are 20 respondents (54.1%) who have good knowledge of trauma patient triage. Additionally, 21 respondents (56.8%) have good knowledge of the primary survey, and 23 respondents (62.2%) have good knowledge of the secondary survey.

### Knowledge of Nurses Regarding Triage, Primary Survey, and Secondary Survey

**Table 3. Competence of Emergency Room Nurses Regarding Triage of Trauma Patients at Ibnu Sina Hospital and Bhayangkara Hospital Makassar (n= 37)**

Competence	Frequency	Percentage (%)
<b>Triage</b>		
Quite Good	10	27,0
Good	27	73,0
<b>Primary Survey</b>		
Quite Good	10	27,0
Good	27	73,0
<b>Secondary Survey</b>		
Quite Good	9	24,3
Good	28	75,7

## The Relationship between Knowledge and Competency of Emergency Room Nurses Related to Advance Care in Trauma Patients at Ibnu Sina Hospital and Bhayangkara Hospital

**Table 4. The Relationship between Knowledge and Competency of Nurses regarding Triage in Trauma Patients at Ibnu Sina Hospital and Bhayangkara Hospital Makassar**

Variable		Competency Score
<b>Triage</b>		
Knowledge Score	r	0.416
	p	0.010
	n	37
<b>Primary Survey</b>		
Knowledge Score	r	0.329
	p	0.047
	n	37
<b>Secondary Survey</b>		
Knowledge Score	r	0.337
	p	0.041
	n	37

Based on table above, the relationship between knowledge and competency of nurses regarding triage in trauma cases at the Emergency Department of Ibnu Sina Hospital and Bhayangkara Hospital Makassar shows the test results with a p-value of  $0.010 < 0.05$ , indicating that knowledge and competency of nurses regarding triage in trauma cases have a significant correlation with an r-value of 0.416.

The relationship between knowledge and competency of nurses regarding the primary survey in trauma cases at the Emergency Department of Ibnu Sina Hospital and Bhayangkara Hospital Makassar shows the test results with a p-value of  $0.047 < 0.05$ , indicating that knowledge and competency of nurses regarding the primary survey in trauma cases have a significant correlation with an r-value of 0.416.

The relationship between knowledge and competency of nurses regarding the secondary survey in trauma cases at the Emergency Department of Ibnu Sina Hospital and Bhayangkara Hospital Makassar shows the test results with a p-value of  $0.041 < 0.05$ , indicating that knowledge and competency of nurses regarding the secondary survey in trauma cases have a significant correlation with an r-value of 0.337. This identifies that "the higher the level of knowledge, the higher the competency of nurses regarding triage, secondary survey, and primary survey in trauma cases.

## 4. DISCUSSION

### The Relationship between Knowledge and Competency of Nurses regarding Triage in Trauma Cases at the Emergency Department

The existence of a relationship between knowledge and competency of nurses regarding triage in trauma cases at the IGD is supported by the history of formal and non-formal education of IGD nurses at Ibnu Sina Hospital and Bhayangkara Hospital Makassar. The majority of nurses have completed formal education, with 25 individuals (67.6%) holding a nursing profession degree, while 28 individuals (75.7%) have undergone non-formal training. Nurses are also

predominantly experienced, with more than 10 years of work in the nursing field, which enhances the skills they possess due to the experiences they have gained.

The accuracy in conducting triage will determine the appropriate emergency intervention steps for trauma patients. Resuscitation and emergency priorities are categories of triage that require a response time of less than 15 minutes and must be promptly addressed. This is in line with the research conducted by Damanik (2018) regarding the relationship between the application of triage and nurses' response time in the emergency department with research results, there is a correlation between the application of red triage and response time for patient care. One of the indicators of successful emergency medical management is the speed of providing adequate assistance to emergency patients, both in routine situations and during disasters.

In line with the research conducted by Ashfaq (2022) about According to the research, there is a correlation between knowledge and the accuracy of decision-making maternal emergency by nurses in triage implementation at Labuang Baji Hospital. These research findings are also consistent with a study conducted in the Emergency Department of RSUP Dr. Wahidin Makassar, which showed that 77.3% of nurses with good knowledge had accurate triage implementation, while 72.7% of nurses with low knowledge had inaccurate triage implementation (Asrullah, 2019).

The factors that significantly determine the knowledge and competence of nurses are education and training. Specific education related to emergency nursing has been obtained since pursuing a bachelor's degree at the university. The Emergency and Critical Care Nursing course is a subject that discusses the management of emergency cases, both trauma and non-trauma. Competence is also acquired through training in the field of emergency care, such as Basic Life Support (BLS) and Basic Trauma Cardiac Life Support, which have curriculums aimed at improving knowledge and competence in managing trauma cases and related skills. This is in line with the theory that states that the higher the level of knowledge, the more mature the thinking and actions taken, and supported by empirical data and facts, this will actualize theoretical concepts into practical applications, especially in the development of health sciences (Hendriana 2023).

Nurses with more than 5 years of work experience generally have good knowledge and competence. The longer the work experience, the better their competence. Experience in handling various cases becomes a learning process for nurses, as it allows them to understand patterns and mechanisms of treatment that align with the Standard Operating Procedures (SOP) for trauma cases. Nurse competence is obtained through three mechanisms, namely through the process of education, work experience, and training. Competence through the education process is obtained indirectly through theoretical learning, laboratory practice, and clinical practice in higher education institutions. Competence through work experience is obtained directly when nurses handle various real cases with repeated actions. According to the research by (Natarianto,2018), 83% of nurses at the Regional General Hospital have good knowledge about triage, and 100% of the nurses have a good perception. Competence through training is obtained directly through standardized and up-to-date learning systems that are tested through a nurse's ability to perform emergency interventions in various cases during training.

However, when analyzed per item in terms of knowledge of triage, it was found that more than 50% of nurses still make mistakes in determining triage categories based on the Canadian Triage and Acuity Scale, as well as determining patient waiting time during triage. This is

consistent with the research findings conducted in the educational setting (Wibowo, 2019) that knowledge and skills in triage should be instilled since college. Strategies that can be implemented include modifying learning methods, extending preparation time, improving trauma case analysis based on triage determination needs, and utilizing triage application technology on smartphones. This will have an impact on the readiness of prospective nurses with high-quality and competitive outputs. In the context of service, there is a need to improve patient triage based on priorities by providing relevant trauma case examples in determining triage categories, either through case studies in hospitals or through emergency training.

Based on the observation results of the respondents, nurses receive triage on trauma patient cases with an estimated time of <5 minutes and prioritize emergency trauma care. Nurses are able to classify trauma cases using 5 priority categories: resuscitation, emergency, urgent, less urgent, and non-urgent. Bhayangkara Makassar Hospital and Ibnu Sina Hospital have implemented patient categorization with 5 levels of triage categories based on CTAS (Canadian Triage and Acuity Scale). The triage system implemented have a positive impact in the ER. The use of 5-level triage category in the hospital is due to the different and specific characteristics of cases. Each triage level is intended for different case categories, different response times, different areas of the room, different observation periods, as well as rapid and appropriate interventions according to the category level. This requires nurses to have knowledge and competence in handling emergency cases in the ER.

### **The Relationship between Knowledge and Competency of Nurses regarding Primary Survey in Trauma Cases at the Emergency Department**

The primary survey is a comprehensive assessment that combines airway assessment, breathing assessment, circulation assessment, disability assessment, and exposure assessment. A proper primary assessment will determine appropriate actions. The most threatening issues that can lead to death are problems with the airway, breathing, and circulation. In any trauma case, the brain and heart are organs that require immediate oxygen and blood supply within 3-8 minutes, as a shortage of blood and oxygen supply can result in irreversible damage.

In line with the research conducted by Raffa.,dkk., (2021) on the relationship between nurses' knowledge of Basic Trauma Cardiac Life Support (BTCLS) and the handling of primary surveys in the Emergency Department of Yarsi Pontianak Hospital in West Kalimantan Province, it was found that nurses' knowledge of Basic Trauma Cardiac Life Support is related to the handling of the primary survey. One's skills or abilities are demonstrated when nurses perform actions according to the applicable Standard Operating Procedures (SOP). The primary survey is also influenced by several factors such as emergency training or workshops. Nurses who have participated in face-to-face training often have a better understanding of triage procedures and primary assessments.

This research is in line with the study conducted by (Plasay, 2022) on the relationship between nurses' knowledge and the implementation of the primary survey in the Emergency Department of Haji Makassar Hospital. It was found that there is a relationship between nurses' level of knowledge and the implementation of the primary survey. Similarly, (Maryati, 2020) conducted a study on the relationship between nurses' level of knowledge of Basic Life Support



(BLS) and nurses' behavior in the implementation of the Primary Survey in the Emergency Department of Karanganyar District Hospital. It was found that there is a relationship between nurses' knowledge of Basic Life Support (BLS) and nurses' behavior in the implementation of the Primary Survey. This is consistent with the theory proposed by Cristian in 2008 (Maryati, 2020), which states that good knowledge has a significant impact on good skills. It is important for nurses to have good skills in effective communication, objectivity, and the ability to make accurate clinical decisions in order to provide optimal patient care.

In the Intensive Care Unit (ICU) and Emergency Department (ED), nurses' knowledge and skills are highly needed, especially in clinical decision-making where skills are crucial in the initial assessment. Nurses must prioritize patient care based on proper decision-making. Therefore, knowledge and skills in nursing interventions are essential.

This is in line with Muzaki's theory, which suggests that skill levels are acquired after exposure to knowledge on the subject matter. The acquired knowledge enables individuals to apply what they have learned in real-life situations. According to (Maryati, 2020), "Identifying that there is a relationship between the knowledge and behavior of nurses in conducting primary assessments, in addition, factors such as experience and motivation can influence skills. Nurses must possess certain factors that can affect their skills, particularly in actions required to build good skills. Emergency Department nurses should have professional skills, which are obtained through education and training in emergency care.

Consistent with the research conducted by Aty, et al., (2021), good competency determines success in handling trauma cases. Proper assessment of the Airway, Breathing, and Circulation improves the survival rate of unconscious patients. Nurhidayati, (2021) states that nurses' competency is expected to be possessed by individuals working in the healthcare field. This competency consists of technical and behavioral competencies. Nurses are considered to have appropriate competency if they can use and optimize both of these main components effectively.

However, when analyzing each question item regarding primary survey knowledge, more than 50% of nurses still make mistakes in airway management for trauma patients, management of electrical burn injuries, determining GCS in trauma cases, and differentiating exposure management from secondary assessment in trauma patients. There are also errors in preventing hypothermia. Therefore, it is necessary to improve nurses' knowledge of primary survey in various trauma cases.

Based on observations, respondents perform primary surveys when receiving patients categorized into 5 levels. Nurses systematically assess 5 aspects in the primary survey. Nurses open the airway and clear the airway in trauma cases using the head tilt and chin lift method for cases without cervical injury, and the jaw thrust method for cases with cervical injury. Nurses provide oxygen assistance based on the needs and condition of trauma patients, using nasal cannula, simple mask, Rebreathing mask (RM), Non-Rebreathing Mask (NRM), and Bag Valve Mask. In the Circulation aspect, nurses measure Vital Signs (TTV) and insert an IV line with the necessary fluids, although most nurses do this upon receiving the patient initially. In the Disability aspect, nurses identify fractures and multiple fractures in trauma cases, as well as assess the level of consciousness using the Glasgow Coma Scale (GCS). In the exposure aspect, nurses conduct further injury examinations while prioritizing patient privacy and provide blankets to prevent hypothermia, especially in patients with hypovolemic shock and hemorrhagic shock.

## **The Relationship between Knowledge and Competency of Nurses regarding Secondary Survey in Trauma Cases at the Emergency Department**

The secondary survey is conducted after the triage and primary survey have been completed. It involves a comprehensive evaluation from head to toe. The purpose of the secondary survey is to identify any secondary issues that the patient may be experiencing, which are then noted and prioritized for further action. Anticipatory measures can be taken to address any potential threats to the patient's health based on the collected data. In accordance with the study conducted by Ali et al. (2022), it was found that nurses have acquired both knowledge and proficiency in effectively managing cases of head trauma following competency training. This expertise extends beyond triage and primary assessment to encompass secondary assessment as well.

In this research, the results obtained indicate that overall the knowledge and competency of nurses related to the secondary survey are in the good category. However, upon analyzing each question item, there are still 3 questions where knowledge confusion was found in conducting assessments. Nurses are still mistaken in determining the assessment conducted after the primary assessment, and they still do not fully understand the signs, symptoms, and interventions in cases of head trauma.

There is a relationship between the knowledge and competency of nurses related to the secondary survey. This is because nurses in the Emergency Department have special qualifications, where they are required to undergo minimum Basic Trauma and Cardiac Life Support training, which is renewed every 4-5 years. In the training curriculum, there is an initial assessment skill where nurses handle patients with multiple trauma, starting from triage determination, primary assessment, and secondary assessment. The assessment rubric for the secondary survey is also included when participants attend the training activities. Nurses enhance their knowledge and competency in the secondary survey according to the latest algorithm in the training, for both trauma and non-trauma emergency cases.

In the study by Yousef et al. (2018), it was clarified that the level of education and training greatly determines the knowledge of nurses in advanced patient care. Good knowledge will determine the competency of nurses in handling trauma cases in hospitals. In the study by (Shehab et al., 2018), it was identified that besides education and training, protocols or Standard Operating Procedures (SOPs) in the Emergency Department are crucial in supporting nurses' knowledge in providing emergency care for patients with head trauma. This is related to the secondary survey, which is incorporated in the form of protocols or SOPs. It is recommended that this should be the standard of care in Emergency Medical Response II.

In addition, research conducted by Jenusi, et al (2020) reveals that nurses' experience as emergency department personnel is significantly related to their knowledge and competency. The more experience they have in handling various types of trauma cases, the better their knowledge and competency as nurses will be.

The research conducted by Ali et al. (2022) demonstrates a significant improvement after implementing a program to enhance the knowledge and competency of nurses in managing patients with head trauma at Banha University Hospital. This is consistent with previous research indicating that education and training have a significant impact on enhancing nurses' knowledge and competency. Nurses will develop critical thinking skills in handling trauma cases with varying

levels of severity. Critical-thinking nurses will assess all aspects comprehensively, not just focusing on visible injuries. They will observe and evaluate potential risks if further intervention is not performed. Nurses who think critically will accurately triage patients, conduct a rapid and accurate primary assessment, and perform a precise and consistent secondary assessment until the patient's condition stabilizes. i.

In some trauma cases, death often occurs without a clearly known cause, referred to as a silent killer. Hemorrhagic shock and hypovolemic shock are the most common causes of death in trauma cases. If nurses do not continuously detect these conditions, especially during the secondary assessment, a significant number of patients may be in an undetectable state of death.

In the research conducted by (Elsayed et al.,2020) at El-Arabi Hospital, it was identified that more than half of the nurses have an unsatisfactory level of knowledge while 51,4% had incompetent level of practice regarding the advanced care of trauma patients. It means that there was a statistical significant difference between nurses's level of knowledge and their level of competence. Consistent with the analysis of individual question items in the secondary survey, it was found that more than 50% of nurses still make mistakes in determining the secondary survey, especially for patients with head trauma. This indicates the need for an improvement in knowledge related to the management of head trauma cases.

Based on the observation results, if the patient's condition has stabilized, the nurse proceeds with the assessment by filling out the nursing assessment form to focus on the secondary assessment (ongoing assessment) by asking about the patient's history of drug allergies, food allergies, and other triggers in trauma patients. The nurse inquires about the patient's last meal schedule in trauma cases, asks about the cause of injury and the mechanism of injury in conscious patients or the patient's family if the patient is unconscious. The nurse performs a head-to-toe physical assessment on trauma patients and collaborates with the doctor for diagnostic tests (EKG, chest X-ray, CT scan, radiology, etc.) as indicated by the trauma case.

## 5. CONCLUSION

The conclusion of this research are, the nurses' knowledge related to triage of trauma patients in the ER in South Sulawesi is categorized as good. The nurses' knowledge related to the primary survey of trauma patients in the ER in South Sulawesi is also categorized as good. Similarly, the nurses' knowledge related to the secondary survey of trauma patients in the ER in South Sulawesi is categorized as good. The nurses' competence in providing advanced care for trauma patients in the ER in South Sulawesi is categorized as good. Furthermore, it was identified that there is a correlation between nurses' knowledge and triage competence in trauma cases in South Sulawesi, as well as a correlation between nurses' knowledge and primary survey competence in trauma cases in South Sulawesi, and a correlation between nurses' knowledge and secondary survey competence in trauma cases in South Sulawesi.

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