

# The Relationship between the Level of Nurse Knowledge and the Accuracy of the Assessment of the Glasgow Coma Scale in Head Injury Patients in the Emergency Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

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## Article Info

### Article history:

Received 12 Dec, 2025

Revised 21 Jan, 2026

Accepted 14 Feb, 2026

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### Keywords:

GCS Assessment Accuracy,  
Knowledge, Nurses

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## ABSTRACT

The Glasgow Coma Scale (GCS) is included in the primary survey carried out when a patient enters the emergency room which is usually assessed by the emergency room nurse and can prevent complications so that it requires a proper GCS examination. The purpose of this study was to determine the relationship between the level of knowledge of nurses and the accuracy of the assessment of the Glasgow Coma Scale in patients with head injuries in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City. Quantitative research method with a cross sectional study approach, the population in this study was all implementing nurses in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City, a research sample of 29 nurses with a total sampling technique, research instruments using knowledge questionnaires and GCS assessment observation sheets, data were analyzed by Chi-square test. The results of the study obtained the level of knowledge of nurses about the GCS assessment which was good knowledge as many as 19 nurses (65.5%) and sufficient knowledge as many as 10 nurses (34.5%), then the accuracy of the right GCS assessment was 21 nurses (72.4%) and inappropriate as many as 8 nurses (27.6%), and a p-value of 0.000 ( $\leq \alpha 0.05$ ) was obtained. It can be concluded that there is a relationship between the level of nurse knowledge and the accuracy of GCS assessment in head injury patients in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City.

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## INTRODUCTION

Head injury is damage to the head, not congenital or degenerative, but caused by an external physical attack or impact, which can reduce or alter consciousness that can cause cognitive and physical function damage (Lestari et al., 2025) and the *Glasgow Coma Scale* (GCS) is to assess the severity of a head damage which is divided into three categories based on a moderate score (GCS 14-15) (GCS 9-13) and weight (GCS 3-8). The highest score is 15 (fully conscious) and the lowest is 3 (poor condition).

According to the *World Health Organization* (WHO) in the United States, head injuries are estimated to reach 500,000 cases each year. In Indonesia, head injuries are the third most common disease and trauma in the world, every year around 1.2 million people die with severe head injuries Due to traffic accidents, 94,617 cases were recorded throughout the 2022 period in Indonesia, this figure increased in 2023 recorded as many as 116,000 cases. This number increased by 6.8% compared to last year (Firmada, 2022).

One of the leading causes of disability and death in the world, especially in developing countries, is head injuries. Patients with head injuries in Indonesia rank 8th out of the top 10 hospitalized diseases in all hospitals, it is estimated that it will increase along with the progress of people's lives, the number of head injury patients in 2020 was obtained data on 240 cases caused by Traffic Accidents (KLL), with sharp and blunt objects, Meanwhile, in 2021 there were 102 cases and in 2022 data was obtained with a total of 70 cases (Suswitha, Tafdhila, & Arindari, 2023).

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Head injuries that occurred in Gorontalo Province according to a Riskesdas report in 2018 were recorded at 17.6%. The Gorontalo Province Riskesdas said the highest injury rate was in Gorontalo Regency (23.95%) followed by Pohuwato Regency (23.23%), Bone Bolango Regency (18.64%), Gorontalo City (13.45%), Boalemo Regency (12.85%) and the lowest in North Gorontalo Regency (8.44%) (Mohamad, Yunus, & Damansyah, 2023).

*Golder hour* in patients with head injuries is 6 hours after the incident, if not treated quickly it will cause serious complications such as decreased post-traumatic memory, decreased consciousness, decreased cognitive function, disability, post-traumatic seizures, agitation, *post-contusion syndrome* and causes death so that to prevent complications need proper examination (Agustien et al, 2025).

The clinical examination used to make it easier to diagnose a head injury is a value check *Glasgow Coma Scale* or GCS (Mohamad et al., 2023). GCS is a clinical benchmark used to assess the severity of injuries in mild, moderate and severe head injuries (Mahoklory, 2021). GCS has the ability to predict life-threatening conditions of 74.8% and predict prognosis with sensitivity of 79-97% and specificity of 84-97% so that GCS has an important role in obtaining information about the level of awareness that will indicate the severity and recovery of head injury patients (Riduansyah, Zulfadhilah, & Annisa, 2021).

GCS is included in the *Primary Survey* which is carried out when the patient enters the emergency room, which is usually assessed by the emergency room nurse. Emergency room nurses have an important role in the initial treatment and independent decision-making in emergency conditions especially in patients with head injuries, so as not to fall into conditions of systemic head injury, disability and death. Good and proper management of head injuries will affect the quality of care and *Outcome Patients* (Mahoklory, 2021).

Nurses in assessing the GCS of head injury patients properly and appropriately can be influenced by various factors including the characteristics of the nurse herself which consists of age, gender, education level and working period (Andrianys, Asriadi, & Ismail, 2023). In addition, nurse knowledge, nurse actions, training certificates and supervision are also factors that can affect nurses in assessing the GCS of head injury patients (Meilando, 2020).

Nurses must have knowledge in assessing the GCS of head injury patients because nurse knowledge is a very important domain to shape nurses' actions in providing treatment to head injury patients. One of the triggers for nurses to have good knowledge during the GCS assessment is due to the increasing need for health services for head injury patients (Yani, Agustiani, & Anggraini, 2024).

Urgenization in patients with head injuries requires emergency handling, so knowledge is needed in handling cases of patients with head injuries, especially patients who already have serious symptoms such as seizures or difficulty speaking, decreased consciousness, seem confused, or there is active bleeding from the ears/nose, and there are severe injuries to the head area. GCS assessment in head injury patients is indispensable in assessing the level of awareness and appropriate actions in handling the case.

According to the assumption that knowledge is one of the triggers, emergency room nurses generally have an important role in the initial handling of patients with head injuries as well as, determining GCS in patients who are in emergency conditions so as not to fall into the condition of systematic head injuries, disability and death.

Research conducted by Yunus et al (2025), showed that there was a relationship between the nurse's knowledge and the initial treatment of head injury patients at the emergency room of the M.M Dunda Limboto Hospital with *p-value* 0.000 <0.05, this is because the better the nurse's knowledge, the better the initial handling of injured patients, and vice versa, the less knowledge the nurse has, the less treatment of head injury patients so that knowledge is needed for the success of patient care, especially in the emergency room.

A preliminary study conducted by researchers in the Emergency Room of Prof. Dr. H. Aloei Saboe Hospital Gorontalo City is known that the number of head injury patients in June-August 2025 with a total of 117 patients, namely in June as many as 36 patients, in July as many as 51 patients and in August as many as 30 patients, it can be seen that the number of head injury patients who entered the emergency room of Prof. Dr. H. Aloei Saboe Hospital Gorontalo City for 3 months has increased.

The number of nurses in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City is 30 nurses and from the results of observations made by researchers, it was obtained that in the initial handling of patients with head injuries, there are also nurses who have knowledge in assessing GCS, there are also some nurses whose level of knowledge is still in the 3rd stage of 6 levels, namely at the stage of applying to the patient's condition but has not yet reached the stage of analyzing to assess the patient's GCS. The results of the researcher's interview with the nurse were also obtained that there were nurses who did not understand in determining GCS caused by the patient's condition, for example, patients who were drunk, patients who had fractures of the orbit and cranial base, and the nurse needed time to answer questions from the researcher related to GCS, so that the nurse was not right in answering the question, namely the researcher asked about the 3rd motor assessment and the nurse still did not answer correctly.

Nurse knowledge about GCS in head injury patients is necessary to assist nurses in categorizing patients, but due to the lack of nurse knowledge this can be an obstacle to providing care to patients so that this can have an impact in determining GCS because with GCS nurses are able to do proper nursing management

for patients. Therefore, the researcher is interested in conducting research on "The Relationship between the Level of Nurse Knowledge and the Accuracy of the Assessment of the *Glasgow Coma Scale* in Head Injury Patients in the Emergency Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City" in the form of a thesis.

## RESEARCH METHODOLOGY

A type of quantitative research with an analytical research design with a cross sectional study approach is a type of research that collects data at a single point in time to describe population characteristics or explore the relationship or influence between independent and dependent variables (Adiputra et al., 2021). Where in the study, the researcher measured an independent variable, namely the knowledge of nurses with the dependent variable of the accuracy of the Glasgow Coma Scale (GCS) assessment at one time. The research has been conducted at the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City. The research time has been carried out on October 21-November 20, 2025. The sample in this study was taken from all implementing nurses in the emergency room, namely 29 people.

### Data Analysis Techniques

#### Univariate Analysis

Univariate analysis is the initial stage in conducting data analysis which generally uses descriptive statistical methods that are carried out on each variable to see the characteristics, namely the distribution of data frequencies (Muharry & Rohman, 2021). The researcher analyzed the variables of nurses' knowledge of GCS in head injury patients and the accuracy of the GCS assessment of head injury patients.

#### Bivariate Analysis

The second step in data analysis is bivariate analysis which aims to see the influence of one variable on other variables (Muharry & Rohman, 2021). In this study, bivariate analysis was used to identify the relationship between independent variables (nurses' knowledge of GCS) and dependent variables (GCS assessment) in implementing nurses in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City, Gorontalo Province by using statistical tests, namely *Chi-square*.

## RESULTS

### Respondent Characteristics

Table 1 Demographic Characteristics of Nurses in the Emergency Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Yes	Respondent Characteristics	Quantity	Percentage (%)
1	<b>Gender</b>		
	Male	11	37,9
	Women	18	62,1
	Total	29	100
2	<b>Age (Years)</b>		
	18-31 years old	12	41,4
	32-45 years old	16	55,2
	46-59 years old	1	3,4
	Total	29	100
3	<b>Final Education</b>		
	DIII Nursing	18	62,1
	Ners	11	37,9
	Total	29	100
4	<b>Length of Work</b>		
	≤5 years	5	17,2
	>5 years	24	82,8
	Total	29	100

Source: Primary Data, 2025

The table above shows that based on gender, the most are women, which is 18 nurses (62.1%), the most age in the range of 32-45 is 16 nurses (55.2) and at least 46-59 years as many as 1 nurse (3.4%), the most recent education is DIII Nursing, which is 18 nurses (62.1%) and the most working time is nurses with a working period of >5 years, which is as many as 24 nurses (82.8%).

### Univariate Analysis

#### The level of nurses' knowledge about GCS assessment in head injury patients in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Table 2 The level of nurses' knowledge about GCS assessment in head injury patients in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Yes	Knowledge Level	Quantity	Percentage (%)
1	Less	0	0
2	Enough	10	34,5
3	Good	19	65,5
<b>Total</b>		<b>29</b>	<b>100</b>

Source: Primary Data, 2025

The table above shows that most of the nurses' knowledge levels about GCS assessment are categorized as good, namely as many as 19 respondents (65.5%).

#### The Accuracy of GCS Assessment in Head Injury Patients at the Emergency Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Table 3 The Accuracy of GCS Assessment in Head Injury Patients at the Emergency Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Yes	GCS Assessment Accuracy	Quantity	Percentage (%)
1	Precise	21	72,4
2	Not accurate	8	27,6
<b>Total</b>		<b>29</b>	<b>100</b>

Source: Primary Data, 2025

The table above shows the accuracy of the GCS assessment in head injury patients assessed by nurses is mostly categorized as appropriate, namely as many as 21 respondents (72.4%).

### Bivariate Analysis

Table 4. Chi-Square Analysis of the Level of Nurse Knowledge with the Accuracy of GCS Assessment in Head Injury Patients in the Emergency Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

Nurse Knowledge of GCS	GCS Assessment Accuracy				Total	%	<i>p-value</i>
	Precise		Less Accurate				
	n	%	n	%			
Less	0	0	0	0	0	0	0,000
Enough	2	6,9	8	27,6	10	34,5	
Good	19	65,5	0	0	19	65,5	
<b>Total</b>	<b>21</b>	<b>72,4</b>	<b>8</b>	<b>27,6</b>	<b>29</b>	<b>100</b>	

Source: Primary Data, 2025

The table above shows that from 10 nurses, nurses obtained sufficient knowledge about GCS with the accuracy of the right GCS assessment as many as 2 people (6.9%) and the inaccurate 8 people (27.6%). Meanwhile, of the 19 nurses, 19 (65.5%) obtained nurse knowledge with the correct GCS assessment. Then, the results of the analysis of the *chi-square* test obtained a *p-value*, which is 0.000 or  $<\alpha 0.05$ , meaning that  $H_0$  was rejected and  $H_a$  was accepted, which means that there is a relationship between the level of knowledge of the nurse and the accuracy of the GCS assessment in patients with head injuries in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City.

## DISCUSSION

### Univariate Analysis

#### The level of nurses' knowledge about GCS assessment in head injury patients in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City

The results showed that the majority of nurses' knowledge levels about GCS assessment were categorized as good, namely as many as 19 respondents (65.5%). This is because at the level of knowledge all respondents answered correctly about the meaning of GCS. At the level of understanding all respondents answered correctly that the patient's responses included eye opening (E), movement or motor (M) and verbal

(V) reactions, at the level of application knowledge all respondents answered correctly that difficulties arose in assessing patients in the form of patients under the influence of alcohol or drugs, intubated, sedated and paralyzed before GCS measurements.

At the level of analysis, all respondents answered correctly that the maximum value in the eye/eye response (E) was 4 and the maximum value in the verbal/speech response (V) was 5 and the maximum value in the moving response (M) was 6. At the analysis level, all respondents answered correctly, namely if one of the reactions/responses cannot be judged to be written with an "X", for example, X-5-6. Meanwhile, at the evaluation level, all respondents answered correctly that the examiner gave any stimulus (loud noise or pinching) but the patient did not open his eyes was given a score of 1, all respondents answered correctly the patient was given a score of 5 when the examiner asked about the patient's orientation and the patient answered clearly and correctly, all nurses answered correctly that the examiner asked the patient orientation and the patient answered but confused and did not know what happened to him was given a score of 3, All nurses answered correctly that a score of 1 was given to patients who were stimulated but did not make a sound or no response.

All respondents answered correctly that the patient was given a score of 4 if the examiner gave the order but the patient ignored it and was given pain stimulation, the patient localized the pain, all respondents answered correctly that the score was given 3 on motor if the patient was given a pain stimulus, then the patient's hands were grasped and on both sides of the body in the upper sternum (decorative position) and all respondents answered correctly that when the examination the patient was given any stimulus Patients who are not moving/unresponsive are given a score of 1. Based on these results, it can be seen that these 19 nurses have answered correctly at every level of knowledge, namely from knowing, understanding, application, analysis, synthesis and even evaluation in assessing the GCS of head injury patients so that this is what makes the respondents have a relatively good knowledge.

The level of knowledge consists of knowing, understanding, application, analysis, synthesis and evaluation. The first three knowledge skills, namely knowing, understanding and application, are usually classified as low levels of knowledge, while the other three skills, namely analysis, synthesis and evaluation, are often said to be high-level knowledge skills. Until this highest evaluation stage, nurses have the ability to make estimates, estimates, or assessments to make decisions about head injury patients. Therefore, nurses whose knowledge is already at the stage from to know to evaluation as the highest level of knowledge can cause their level of knowledge to be classified as good (Wurarah, 2022).

Supported by research Andrianys et al (2023), where for a general understanding of GCS nurse knowledge is good, namely the measurement of the level of awareness by paying attention to the patient's response consisting of *Eyes* (E), *Motoric* (M), and *Verbal* (V). For nurses' knowledge in classifying head injury patients based on GCS scores, nurses' knowledge is good.

The researchers assumed that the level of nurses' knowledge of the *Glasgow Coma Scale* (GCS) assessment in the majority of head injury patients was in the good category. This is because most of the respondents have reached a high level of knowledge, covering all cognitive levels ranging from knowing, understanding, application, analysis, synthesis, to evaluation.

Nurses whose knowledge of GCS assessment is categorized as sufficient in 10 people (34.5%) because at the level of knowledge all respondents have answered correctly about the meaning of GCS. At the level of understanding, respondents answered correctly 3 things that were considered in assessing GCS, namely EVM, while the majority of these respondents answered correctly that the maximum value of GCS is 15 and the minimum value of 0 even though the minimum value of GCS is 3. At the application level of 10 respondents, only 6 respondents answered correctly that difficulties arise in assessing patients if the patient is under the influence of alcohol/drugs, intubated, distracted or paralyzed before the patient is measured by GCS, while there are still respondents who stated that the way GCS is written is in order of E-V-M according to the values obtained or it can also be written randomly.

At the level of analysis, all nurses answered correctly that the maximum value in the eye response was 4, the maximum value in the verbal response was 5 and the maximum value in the motor response was 6. All nurses at the synthesis level answered correctly that if one of the patient's responses could not be assessed, then the writing was with an X value such as X-5-6. At the evaluation level, the majority of nurses as many as 9 people answered incorrectly that the examiner called the patient's name or ordered the patient to open his eyes was given a score of 4, all nurses answered correctly that the examiner gave any stimulation the patient still did not open his eyes was given a score of 1, all nurses answered correctly that the examiner asked the patient's orientation which the patient answered clearly, correctly, quickly was given a score of 5.

The level of knowledge is that in the evaluation all nurses answered correctly that the examiner gave a stimulus but the patient did not respond was given a score of 1 and when the examiner gave any stimulus the patient did not respond was given a score of 1. Meanwhile, at this level of evaluation, there are still many respondents who have not answered correctly, namely the majority of respondents answered correctly that the examiner approached the patient and the patient spontaneously opened his eyes and saw the examiner was given a score of 3 even though the correct answer should have been given a score of 4 and all nurses answered

incorrectly that the examiner gave pain stimulation and the patient tried to refuse the patient was given a score of 5 even though the statement was correct.

Based on these results, it can be seen that there are several statements that are answered correctly, but there are also statements that are answered incorrectly by the respondents, especially at the level of understanding, application and evaluation so that this causes the respondents' knowledge to be quite sufficient. These respondents are sufficiently knowledgeable from the characteristics of the respondents, namely the level of education dominated by the level of nursing DIII education so that it can affect the level of knowledge of nurses about the GCS assessment.

Supported by the theory that nurses' knowledge can be influenced by several factors, including education level because education level is one of the factors that affect a person's perception because it can be easier to make decisions and act. Knowledge is very closely related to education where it is expected that a person with higher education will have a wider range of knowledge (Indarwati et al., 2024).

In line with research by Alsharif et al (2024) conducted at Saudi Hospitals showed sufficient nurse knowledge in assessing GCS patients were mostly nurses whose level of education was categorized as diploma found in 6 people (75%).

The researcher's assumption that the level of knowledge of GCS is due to the fact that there is still ignorance of nurses at the level of knowledge of understanding, application and evaluation which means that at every level of knowledge the nurse knows about the assessment of GCS and this can also be influenced by the level of education of nurses.

### **The Accuracy of GCS Assessment in Head Injury Patients at the Emergency Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City**

Based on the results of the study, it shows that the majority of nurses in assessing the GCS of head injury patients who enter the emergency room are mostly correct, namely as many as 21 respondents (72.4%) in assessing GCS because when the researcher makes observations on the nurses who conduct the GCS assessment, then the results of the GCS assessment from the nurse are seen by the nurse as the same as the researcher or the answer or assessment of the respondent is correct, meaning that there is a match of the score based on the GCS indicator, namely *eye*, *verbal* and *motor* between the results of the GCS assessment by the nurse and the results of the GCS assessment by the researcher so that the assessment of the GCS of the nurse is relatively appropriate.

Accuracy in performing GCS measurements in patients with neurological disorders such as head injury patients is critical for advanced clinical decision-making (Prasetyo & Purwanto, 2025). Client responses that need to be considered include three things, namely eye-opening reactions, speech responses, and motor responses. Each component of GCS and the sum of GCS scores are very important, so GCS scores must be written correctly. Proper GCS assessment can have benefits such as determining the initial level of awareness, monitoring changes in the condition of head injury patients, assisting in the planning of patient care and treatment, classifying the severity and awareness of head injury patients, helping to predict the prognosis and improving the efficiency of communication between other health workers other than nurses regarding the patient's condition (Setiawan et al., 2023).

The results of this study are in line with previous research by Andrianys et al (2023), which shows that nurses in the emergency room of Labuang Baji Makassar Hospital are mostly correct in assessing the GCS of head injury patients with a total of 26 nurses or 78.8%.

The right nurse in assessing GCS is out of the 21 people, there are 7 people whose level of education is nurses so that the accuracy of GCS assessments on these respondents is due to their level of education. This is as in theory Wijayanti et al (2025) which states that the level of continuous education or the high level of education of nurses such as nurses can affect the ability of nurses to apply the knowledge or theory gained into practice. Supported by research Andrianys, Asriadi, & Ismail (2023) The right nurse in assessing the GCS of head injury patients in the emergency room is dominated by nurses whose education level is nurses with a percentage of 69.7%.

In nurses with the accuracy of the right GCS assessment from 21 people, there were 14 nurses who were seen from the characteristics of their working length >5 years with a range of 6-15 years of work, so this length of work caused nurses to accurately assess the GCS of head injury patients. This result is in line with the theory of Notoatmodjo (2018) stating that the longer the nurse works, the more experience is gained about the GCS assessment they have, which has an impact on the accuracy of the GCS assessment of head injury patients by nurses in the emergency room. Strengthened by research Andrianys, Asriadi, & Ismail (2023), showing that the length of nurses' work >5 years mostly correctly assessed the GCS of head injury patients with a percentage of 72.7%.

The researcher's assumption is that nurses in the emergency room show accuracy in assessing *the Glasgow Coma Scale* (GCS) of head injury patients. This accuracy is confirmed through observation where the nurse's assessment is consistent with the researcher's assessment based on GCS (eye, verbal, and motor response) indicators. The accuracy of GCS measurements is critical for clinical decision-making, treatment

planning, severity classification, and prediction of the prognosis of head injury patients. This accurate assessment can be beneficial for patients as well as nurses, as well as other healthcare workers.

Based on the results obtained, there were 8 people (27.6%) who were not accurate in assessing GCS in head injury patients. The lack of accuracy of nurses assessing the patient's GCS is due to the difference in the results of the GCS assessment between nurses and researchers where the average nurse is wrong in assessing verbal indicators such as in Severe Brain Injury patients who should have a verbal score of 3, but are assessed 2 by the nurse so that this causes errors in the GCS assessment. This is because at the time of the research it also appeared that there were nurses who were hesitant or unsure of determining the patient's GCS.

Inconfidence is a nurse's feeling of doubt about her own judgment in dealing with certain situations. This uncertainty can affect clinical judgments such as the assessment of the patient's GCS making it difficult to make clinical decisions for patients, which can have an impact on patient safety and care (Shabestari et al., 2024).

Supported by research findings Andrianys et al (2023) which was carried out at the emergency room of Labuang Baji Makassar Hospital, it was found that there were some nurses at the hospital, namely 7 people (21.2%) who did not accurately assess the GCS assessed by nurses in patients with head injuries.

The respondents who were not accurate in assessing the GCS of head injury patients were 8 people (27.6%), judging from the level of education, there were 4 nurses whose last education was DIII nursing and there were 4 nurses whose working period was  $\leq 5$  years, which was 2-5 years. Therefore, according to researchers, nurses' education level and length of work are related to the lack of accuracy of nurses in assessing the GCS of head injury patients.

Clinical decision-making by emergency nurses such as in the GCS assessment is included in a complex process that can be influenced by a combination of internal factors such as length of employment and nurse education level (Elsavina et al., 2025). As in the research Andrianys et al (2023) nurses whose DIII nursing education level is 15.2% incorrectly assessed GCS and whose length of work was  $\leq 5$  years was also incorrect in the assessment of GCS for head injury patients whose percentage was 18.2%.

The researcher assumes that there are nurses who incorrectly assess the GCS of head injury patients caused by differences in GCS assessment results from both the respondents (nurses) and the researcher based on the three aspects (*eye*, *verbal* and *motor*) which are caused by the nurse's uncertainty which ultimately has an impact on clinical assessment, decision-making, patient safety and overall patient care.

### **Bivariate Analysis**

#### **The Relationship between the Level of Nurse Knowledge and the Accuracy of GCS Assessment in Head Injury Patients in the Emergency Room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City**

Based on the results of the study, it was shown that there was a relationship between the level of knowledge of nurses and the accuracy of GCS assessments in head injury patients in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City, where nurses whose knowledge was categorized as good were mostly correct in assessing GCS for head injury patients with a total of 19 respondents (65.5%) because the level of knowledge was good in every indicator of knowledge, both from *tofu* to evaluation related to the basics of GCS knowledge (definition, GCS indicators, GCS scores, classification of head injuries based on GCS, difficulty of GCS assessment and how to write GCS), *eye* responses, *speech* responses and *verbal* responses that cause nurses to perform GCS assessments according to the patient's circumstances so that the nurses are accurate GCS assessments based on *eye*, *verbal* and *motor*. So, it can be seen that the better the level of knowledge of the nurse about the GCS assessment of head injury patients, the better the accuracy of the GCS assessment.

Knowledge of how to assess GCS in the Emergency Facility affects making the right decision in patients who need immediate attention as well as paying attention to complications that occur after GCS assessment (Susilo, Syarifah, & Deliana, 2025). This knowledge includes a theoretical understanding of visual responses, verbal responses and motor responses, thus an adequate level of knowledge becomes an essential foundation for emergency room nurses in providing care to patients and contributing to the safety of head injury patients (Prasetyo & Purwanto, 2025).

The results of the research obtained in this study are supported by research findings Saputra (2024), which was obtained that there was a significant relationship between nurses' knowledge and the accuracy of GCS assessments in the emergency room of Temanggung Hospital, meaning that the better a nurse's knowledge of GCS, the higher the accuracy of the nurse in assessing the condition of head injury patients.

Respondents whose knowledge was good with the accuracy of the GCS assessment of head injury patients in 19 respondents (65.5%), were obtained between gender characteristics and the level of knowledge dominated by female nurses, namely 11 people out of 19 people and the accuracy of GCS assessment of 19 people was also dominated by women. Therefore, according to researchers, the gender of nurses, namely women, has a good level of knowledge about GCS assessment which has an impact on the accuracy of GCS assessment of head injury patients, compared to men.

Female nurses are more thorough in every action they give because this thoroughness causes more nurses to be accurate in assessing GCS, while male nurses are faster in terms of response than female nurses who are at risk of making mistakes in GCS assessments (Yanti, Agustiani, & Agustin, 2024).

Nurses who have sufficient knowledge about GCS, but the accuracy of the GCS assessment is exactly 2 people (6.9%) because from the characteristics of the respondents, namely the length of work of the two respondents is categorized as >5 years, namely they have worked for 6 years and 18 years. Therefore, the length of the nurse's work can affect the accuracy of the GCS assessment of head injury patients.

The length of work is the time in which a person works. The longer a person works, the more knowledge about GCS assessments he has. The length of work can be associated with a person's experience having a positive or negative impact, considering that many or long experiences will have a tendency to act better than the new one. The length of work >5 years has a positive attitude considering the peak of a person's working period during that period (Notoatmodjo, 2018).

Research Andrianys et al (2023) It was found that there was a long-term relationship with the accuracy of the GCS assessment of head injury patients in the emergency room of Labuang Baji Makassar Hospital with *p-value* 0.000 because nurses who have worked for a long time  $\leq 5$  years are mostly incorrectly assessed GCS with a total of 6 people (18.2%) and nurses who have worked for a long time >5 years, almost all nurses, namely 25 people (72.7%), correctly assessed GCS patients.

The results of this study were also obtained from 10 nurses whose knowledge was quite sufficient, there were 8 people (27.6%) who did not accurately assess the GCS of head injury patients in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City. Because of the age characteristics of the respondents, namely 7 out of 8 respondents were in the range of 18-31 years who had just entered early adulthood and the majority of 4 out of 8 respondents stated that the GCS assessment could experience difficulties if the patient was under the influence of alcohol or drugs, intubated, died, or paralyzed before the GCS measurement was carried out so that the characteristics of the nurse's age and the patient's condition affected the accuracy of the GCS assessment.

The age of the nurse affects the accuracy of the nurse's GCS assessment where age affects a person's ability to grasp and mindset. The older he gets, the more his ability and mindset will increase. Meanwhile, the age that is just starting to enter the age of catchability and mindset is still lacking because it is just starting to develop (Notoatmodjo, 2018). According to Aditya (2020), the patient's condition, for example, patients who are sedated or who are given sedation drugs before the GCS assessment can affect the accuracy of the GCS assessment because sedation drugs affect the GCS measurement components of eye response and motor response.

In line with research Andrianys et al (2023) obtained that there was a relationship between the age of the nurse and the accuracy of the GCS assessment of the head injury patient with *p-value* 0,030 ( $< \alpha$  0,05). Strengthened by research findings Alsharif et al (2024), the age of nurses who are classified as early adults is dominated by sufficient nurse knowledge as many as 37 people (80.4%) which can affect the accuracy of the patient's GCS assessment.

Based on the results of the study obtained from 10 nurses whose knowledge was classified as sufficient and inappropriate to assess GCS, there were 4 nurses who received patients who were diagnosed with severe brain injuries. Where in Nusdin (2020) stating that patients with severe brain injuries are indeed difficult to determine their GCS scores because the patient's condition is very serious and often experiences a decrease in consciousness as a result of which the GCS assessment is challenging, and requires periodic assessments to see neurological changes so that nurses tend to be inaccurate in assessing the patient's GCS.

The researcher's assumption is that there is a relationship between the level of nurse knowledge and the accuracy of the GCS assessment in head injury patients in the emergency room because the better the level of nurse's knowledge about the GCS assessment of head injury patients, the better the accuracy of the GCS assessment, and vice versa, the more sufficient the nurse's knowledge, the less accurate the GCS assessment of head injury patients. However, both the nurse's knowledge and the accuracy of the GCS assessment can be influenced by various factors including the age of the nurse related to the maturity of the nurse's thinking pattern, the length of work associated with experience in dealing with various patients in the room and the patient's condition which affects the components or indicators of the GCS assessment.

## CONCLUSION

The level of nurses' knowledge about the assessment of GCS in head injury patients at the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City is mostly classified as good knowledge. The accuracy of the assessment of the nurse's GCS in the head injury patient at the emergency room of the Prof. Dr. H. Aloei Saboe Hospital in Gorontalo City was mostly correct in assessing GCS. There was a relationship between the level of nurse knowledge and the accuracy of GCS assessment in head injury patients in the emergency room of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City with a *p-value* of 0.000 ( $< \alpha$  0.05).

**ADVICE**

The hospital is expected to use the results of this study as one of the evaluation materials for the knowledge of nurses in assessing the GCS of head injury patients and conducting training or providing material on GCS to nurses who are not appropriate in the GCS assessment so that the hospital can improve the ability of nurses to assess the GCS of patients who enter the emergency room so that patient nursing services are improved.

Nurses can restudy the GCS assessment in order to increase their level of knowledge about GCS and determine the level of awareness of head injury patients.

The results of this research are expected to be used as a reference in the teaching and learning process of students during emergency nursing learning for nursing students at the University of Muhammadiyah Gorontalo.

The researcher is further expected to develop other factors related to the accuracy of the GCS assessment in addition to the level of knowledge of emergency room nurses such as gender, age, education, length of work and condition of the patient or patient diagnosis.

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