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Original Article

Nurses' Knowledge Regarding Glasgow Coma Scale at Tertiary Care Hospital Karachi, Pakistan

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ABSTRACT

The "Glasgow Coma Scale" (GCS) is a neurological scale used to assess the level of consciousness in patients with brain injuries. GCS measures three aspects of a patient's neurological function: eye-opening, verbal response, and motor response. Each category is assigned a score from 1 to 4 or 1 to 5, depending on the response observed, with a total possible score of 15. **Objective:** To assess the nurses' knowledge regarding Glasgow Coma Scale at tertiary care hospital in Karachi, Pakistan. **Methods:** This Quantitative, descriptive Cross-Sectional study was conducted at the tertiary care Hospital of Karachi, Pakistan, from September to December 2022. A total of 50 nurses were recruited through purposive sampling from the hospital's different departments, emergency departments, Neurology, and ICUs. Moreover, those nurses who had three months of experience were included in the study. The data were collected through a valid and reliable tool that was self-administered. **Results:** This study's findings revealed that Male participants were 64% and females 36%. Furthermore, findings show that 06% of participants had a low level of knowledge,72% had a moderate level of knowledge, and 22% had a high level of knowledge regarding GCS. **Conclusions:** Overall, these findings highlight the importance of continued education and training on GCS for healthcare professionals and the general public to ensure better outcomes for individuals who experience traumatic brain injuries.

INTRODUCTION

The "Glasgow Coma Scale" (GCS) is a neurological scale used to assess the level of consciousness in patients with brain injuries. It was first developed in 1974 at the University of Glasgow and has since become widely used in emergency medicine to evaluate the severity of brain injuries. The GCS measures three aspects of a patient's neurological function: eye-opening, verbal response, and motor response. Each category is assigned a score from 1 to 4 or 1 to 5, depending on the response observed, with a total possible score of 15. The higher the GCS score, the better the prognosis for the patient. A score of 8 or below is generally considered to indicate a severe brain injury, while a score of 9 to 12 is considered moderate, and a score of 13 to 15 is considered mild. The GCS is a simple but effective tool for assessing patients' consciousness levels and guiding their management and treatment [1]. Furthermore, the Glasgow Coma Scale objectively describes the extent of impaired consciousness in all types of acute medical and trauma conditions patients [2]. The GCS grading method assesses the "complexity and extent of compromised awareness." The GCS requires that applications be scored under a wide range of steady settings. The GCS is a clinical test used worldwide to assess impaired consciousness. For decision-making and triage, the GCS grading system is

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essential [3]. According to Hussain and Rasheed, the Glasgow Coma Scale has three indicators: best eye response (E), best verbal response (V), and best motor response (M). The intensity of responses in the indicator of the Coma Scale is graded from 1 to 4 for the eye-opening response: score of 4 for best/spontaneous response, response to speech has 3, response to pain has 2, and patient with no response has 1 score & 1 to 5 for best verbal response and 1 to 6 for best motor response patient-oriented to time, place, and person have 5 scores, a confused patient has 4, patient with the inappropriate word have 3, patient with incomprehensible sounds have 2 and patient with no response have 1 score. The patient who obeys commands has a 6 score. The patient who moves to localized pain has 5, the patient with drawl from pain have 4 patient with abnormal flexion has 3, the patient with abnormal extension has 2, and the patient with no response has 1 score. The sum of all three parameters of the Coma scale falls between 3 to 15, a low score shows the worst, and a high score represents the best conscious level [4]. A patient with eight or less than eight was called a comatose client, and a patient with a 3 score was called unresponsive [5]. GCS lies in its applicability in various clinical situations and is widely used by healthcare staff. Its ease of use opens it up to misinterpretation and misapplication. Additionally, determining the degree of awareness and recording it are vital tasks for medical professionals who treat patients with neurological or neurosurgical conditions and those with chronic illnesses in their advanced age [6]. The evaluation assists in determining the patients' neurological issues and evaluating treatment options. It may denote a course of action or therapy during an emergency [2]. The GCS is currently a problem for nurses worldwide regarding clinical practice [7]. Additionally, as a proper element of nursing care is crucial for the outcome of patients, nurses working in critical care should be able to assess consciousness levels as easily as other routine observations of vital signs. Due to delays in diagnosis and treatment, failing to evaluate GCS after a head injury is another prevalent reason for needless mortality and morbidity. Additionally, nurses must be knowledgeable about GCS to protect patients [8]. There are few pieces of research on GCS study in medical sciences. The reason for this study is that there are lots of difficulties faced by nurses in checking the GCS level of patients; due to lack of knowledge, patients face lots of complications. So, this study aimed to assess nurses' knowledge regarding GCS.

METHODS

This Quantitative, descriptive Cross-Sectional study was conducted at PNS Shifa Hospital Karachi, located in DHA phase-II near Korangi Road Karachi, from September to December 2022. A total of 50 nurses were recruited through purposive sampling techniques from the hospital's different departments, Emergency Department, Neurology, and ICUs. Moreover, those nurses who had more than three months of experience were included in the study. Those nurses who were on leave, non-volunteer during the data collection period, Lady health visitors, Midwives, and Paramedical staff were excluded from the study. The sample size was calculated through open EPI with a 95% confidence interval; with a population size of 55, the obtained sample size is 50. The Horizon School of Nursing and Health Sciences gave a study approval letter. After that, permission to collect data from the PNS SHIFA hospital administration was acquired through the hospital research committee. The written consent form was taken from each participant before data collection. The researchers protected the anonymity of participants and keeping researched data confidential. The data were collected by questionnaire form distributed to nurses who met the inclusion criteria. The tool was designed with the help of the literature and had two components. Component-I was demographic data consisting of 3 questions, age, gender, and working area. Component II is the knowledge assessment tool of GCS. This component consists of 10 questions to assess the nursing students' knowledge of GCS. Three experts with at least 4 years of expertise in neuroscience evaluated the items in the knowledge component for their applicability. Initial findings showed the instrument's low (0.73) content validity index (CVI). Based on the expert's recommendations, instruments were changed to reach a CVI of 0.8. The data were analyzed with "SPSS" version 26.0. Frequency and percentage were used for the demographic data and the knowledge assessment.

RESULTS

Table 1 shows the results of demographic variables among 50 participants. Male participants were 32 (64%), and females were 18 (36%). Regarding their age, 27 (54%) participants were between 21-25 years, and 23 (46%) were between 26-30 years old. Concerning their working department, 40% were working in the ER, 20% in the neurology unit, and 40% in the ICUs.

Table 1: Result of Demographic characteristics n=50

Variables	Frequency (%)
Age	
21-25 years	27 (54.0)
26-30 years	23 (46.0)
Above 30 years	0 (0)
Gender	
Male	32 (64.0)
Female	18 (36.0)

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Working Department	
ER	20 (40.0)
Neurology	10 (20.0)
ICU	20 (40.0)

Table 2 shows the result of participants' responses to every question. "What is the function of GCS?" - Only 20% of participants answered this question correctly, indicating that most participants did not have a good understanding of the function of the Glasgow Coma Scale. "How many indicators of GCS?" - All participants answered this question correctly, suggesting that the number of indicators on the GCS is well-known. "What is the best score of GCS?" - Almost all participants (98%) answered this question correctly, indicating that most people know the highest possible score on the GCS. "What is the worst score of GCS?" - Only 48% of participants answered this question correctly, suggesting that many people do not know the lowest possible score on the GCS. "What is the motor response in the number 4 GCS scale?" - Just over half of the participants (52%) answered this question correctly, indicating that the motor response in the number 4 GCS scale is not well-known by a significant proportion of people. "Which GCS scale score indicates that the client is in a coma?" - The majority of participants (88%) answered this question correctly, suggesting that most people know the score that indicates a coma on the GCS. "What does a GCS of 3 mean?" - 78% of participants answered this question correctly, indicating that most people know the meaning of a GCS score of 3. "How can I check the patient GCS eye-opening?" - Most participants (90%) answered this question correctly, indicating that most people are familiar with assessing a patient eye-opening. "How many types of commas?" - Only 28% of participants answered this question correctly, indicating that most people do not know how many commas there are. "What does GCS stand for?" - Almost all participants (98%) answered this question correctly, indicating that most people know what GCS stands for. Moreover, Questions 2, 3, 5, 6, 7, 8, and 10 were generally answered correctly, with correct answer rates ranging from 78% to 100%. This suggests that the participants had a good grasp of the number of indicators, best and worst scores, motor response in the number 4 GCS scale, the score indicating a coma, the meaning of a GCS of 3, how to check a patient's GCS eye-opening, and what GCS stands for. On the other hand, questions 1 and 9 had a correct answer rate of only 20% and 28%, respectively, indicating that the participants had a poor understanding of the function of GCS and the number of types of comas.

Table 2: Participants' Response to Every Question

Statement	Correct answers N (%)	Wrong answers N (%)
What is the function of GCS?	10 (20)	40 (80)
How many indicators of GCS?	50 (100)	0 (0)
What is the best score of GCS?	49 (98)	1 (2)
What is the worst score of GCS?	24 (48)	26 (52)
What is the motor response in the number 4 GCS scale?	26 (52)	24 (48)
Which GCS scale score indicates that the client is in a coma?	44 (88)	6 (12)
What does a GCS of 3 mean?	38 (78)	12 (24)
How can I check the patient GCS eye-opening?	45 (90)	5 (10)
How many types of comas?	14 (28)	36 (72)
What does GCS stand for?	49 (98)	1 (2)

Table 3 results show that out of the total 50 participants, only 3 (or 6%) had a low level of knowledge on the subject being studied. In comparison, a majority of 36 participants (or 72%) had a moderate level of knowledge. The remaining 11 participants (22%) had a high level of knowledge regarding GCS.

Table 3: Levels of Knowledge

Level Of Knowledge	Total Participeants (%) N=50
Low Level	03 (06)
Moderate Level	36 (72)
High Level	11 (22)
Total Participants	50 (100)

DISCUSSION

This study aimed to assess nurses' knowledge regarding Glasgow Coma Scale (GCS) and is vital because GCS is a widely used tool for assessing the level of consciousness of patients with traumatic brain injuries or neurological conditions [9]. As front-line healthcare providers, nurses play a crucial role in assessing and managing patients with these conditions, and accurate and timely assessment of GCS is critical for patient outcomes. Current findings show that only 20% of participants answered this question correctly, indicating that most participants did not have a good understanding of the function of the Glasgow Coma Scale. In contrast, another study shows that 99% of the participants understand the function of GCS [10]. These findings suggest that there may be a gap in knowledge among the participants. This may have implications for the quality of patient care provided by the nurses in this study. However, the comparison to another study where 99% of participants understood the function of GCS may indicate differences in the sample characteristics or the methods used to assess knowledge. Present findings revealed that - Only 48% of participants answered this question correctly "What is the worst score of GCS?" suggesting that many people do not know the lowest possible score on the GCS. In

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contrast, another study found that 97% of the participants knew about the worst score of GCS [10]. This is particularly concerning because the worst score of GCS indicates the severity of traumatic brain injuries or neurological conditions [11, 12]. Nurses unaware of the worst score of GCS may fail to recognize critical conditions and provide appropriate interventions, leading to adverse patient outcomes [13]. Current findings revealed that "What is the best score of GCS?" - Almost all participants (98%) answered this question correctly, indicating that most people know the highest possible score on the GCS. Another study's findings parallel ours, showing that 98% of the participants answered this question correctly [10]. These findings suggest a high level of knowledge among the participants in this study. This is particularly important because the best score of GCS is an essential indicator of the patient's level of consciousness and is used to assess the severity of traumatic brain injuries or neurological conditions [14]. Nurses aware of the best score of GCS can accurately evaluate the patient's condition and provide appropriate care, improving patient outcomes [15]. The current findings show that the participants had a good grasp of the number of indicators, best and worst scores, motor response in the number 4 GCS scale, the score indicating a coma, the meaning of a GCS of 3, how to check a patient's GCS eye-opening, and what GCS stands for. Overall, the findings suggest that the participants in this study have a good understanding of several important aspects of the GCS. However, further research could explore the factors contributing to their knowledge and identify additional education areas. Furthermore, training may be needed to ensure that nurses are well-equipped to provide high-quality care for patients with traumatic brain injuries or neurological conditions [16-19]. Present findings show that out of the 50 participants, only 3 (or 6%) have low knowledge of the studied subject. In comparison, a majority of 36 participants (or 72%) have a moderate level of knowledge. The remaining 11 participants (or 22%) have a high level of knowledge. Furthermore, another study showed that 50.4% had insufficient knowledge, 62.6% of participants had good knowledge, and only 5.2% demonstrated good knowledge [20]. Similarly, another study conducted in Karachi showed that 41.5% had adequate knowledge, only 38.3% had good knowledge, and 20.2% of nurses had poor knowledge of GCS [4]. This suggests that while many participants have some level of understanding, there is still room for improvement in their knowledge and understanding of the topic. It is important to note that having a moderate level of knowledge does not necessarily indicate a lack of proficiency or competence but suggests room for improvement. It is also noteworthy that only a small number of participants (6%) have a low level of knowledge, which is a positive finding. This suggests that most participants have a basic understanding of the subject and do not lack knowledge. This could be attributed to previous education or training, work experience, or personal interest in the subject.

CONCLUSIONS

Based on the findings, it can be concluded that most participants (72%) had a moderate level of knowledge regarding GCS (Glasgow Coma Scale), a neurological scale used to assess the level of consciousness after a traumatic brain injury. This suggests that while there is room for improvement in knowledge among the participants, many have a basic understanding of GCS. On the other hand, a smaller proportion of participants (22%) had a high level of knowledge, indicating that there is still room for improvement and more education on GCS. It is also concerning that 6% of participants had a low level of knowledge, as this suggests that they may not be well-equipped to recognize and respond appropriately to traumatic brain injury situations. Overall, these findings highlighted the importance of continued education and training on GCS for healthcare professionals and the general public to ensure better outcomes for individuals who experience traumatic brain injuries.

Authors Contribution

Conceptualization: AB
Methodology: AA, MAK, RA, MHS
Formal analysis: MAK, MH
Writing-review and editing: AB, MZ, MAK, MJ,SM, NK

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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