Knowledge and Utilization of the Glasgow Coma Scale (GCS) in Evaluating Unconscious Patients among Clinical Nurses in a Nigerian Referral Health Centre

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Original Research Article

ABSTRACT

Introduction: Glasgow Coma Scale (GCS) is the foundation of the neurological appraisal of patients utilized by both nursing and clinical staff. The study was conducted to ascertain the level of knowledge, utilization and variables that prevent nurses using the GCS to evaluate unconscious patients at the teaching hospital of Modibbo Adama University in Yola, Adamawa state, Nigeria.
Materials and Methods: The study utilized descriptive research cross-sectional design. the sample size for the study was calculated using Taro Yamane's method, a structured questionnaire was administered to 131 respondents to collect data for the study out of which 117 were successfully filled and retrieved. Data collected was analysed and presented on tables.
Finding: The findings revealed that more than half of the respondents (60%) were female with post basic nursing qualification, majority (61%) of the nurses surveyed were knowledgeable of GCS,

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88% & 84% of respondents respectively reported that lack of knowledge regarding the GCS's use and not having self-confidence regarding the application of GCS were the main factors that hindered them to their capacity to apply the GCS in their routine practice.

Conclusion: It was concluded that the study subjects had good knowledge of GCS, so also utilization status of the GCS was very good.

Recommendation: Based on the findings, it was recommended that Nurses must work harder to stay current with their knowledge and practice doing the GCS examination, and management should create an educational team to evaluate, instruct and make sure that nurses adhere to utilizing the GCS appropriately.

1. INTRODUCTION

Graham Teasdale and Bryan J. Jennet, professors of neurosurgery at the University of Glasgow, initially published the Glasgow Coma Scale (GCS) in 1974. All forms of acute medical and trauma patients can have their level of awareness objectively described using the GCS and extent of impaired consciousness. The major task for medical professionals who treat individuals with neurological or neurosurgical issues are consciousness assessment and documentation. The evaluation assist in determining the neurological issues affecting the patients and assessing treatment options. According to Hien & Chae [1], in urgent situation, it may be sign that therapy or action is necessary.

GCS usage necessitates prior knowledge and expertise. This scale, when used properly and methodically, is essential for patient evaluation and measurement establishment in order to ensure dependability-which is essential to track the development of such patients [2]. Numerous research was created over a long period of time to assess the accuracy and dependability of GCS. Only 42.7% of nurses use the GCS to evaluate consciousness, according to Settervall & Sousa's [3] studies. These studies demonstrate low GCS use compliance, application challenges, and professional failures related to conscience evaluation, including a lack of standards and inadequate scale knowledge. In addition, hospital routine is a factor that contributed to the prioritization of other organic systems. The routine of health professionals, especially those working in intensive care units (ICU) and emergency services (ES), who are more skilled and knowledgeable in the application of GCS with better levels of accuracy and reliability, is to measure degree of awareness [4].

Patients are evaluated using the scale based on their verbal, motor, and eye-opening reactivity. Each of these should be reported separately to give a clear, understandable picture of the patient's condition. When it comes to providing the patient with outstanding care in a medical context, verbal interaction that is both active and meaningful is crucial [5].

The Glasgow Coma scale uses numerical ratings from 1 to 5 to indicate the degree of awareness and responsiveness for each activity, which includes eye-opening, the best motor response, and the best verbal response. The GCS scale offers a score that ranges from 3 to 15. Patients with scores between 3 and 8 are typically classified as having neurological injuries, such as a coma. The lowest GCS is three, which could indicate a deep coma or death, and the highest is 15, which denotes being fully alert and focused [6].

A study by Yusuf et'al [7] was one of the few published works that assessed physicians' knowledge of GCS among 141 doctors at a teaching hospital in Ilorin, Kwara State, Nigeria. They used a questionnaire as an instrument for data collection, and their study revealed that most of the respondents (97%) could indicate correctly what GCS stands for and identify each categorization. However, respondents' overall performance in rating the GCS's component parts was unsatisfactory. For instance, just 53 (37%) people properly answered all the questions. According to Yusuf et'al [7], more doctors (41%) who had received training in these disciplines were able to recall and properly assess the GCS categories than those (31%) who had not (quoted in [8]).

According to a study by Ogunfowokan et al. [9] who assess clinical nurses' use of the Glasgow

Coma Scale in a few Osun State teaching hospitals, 83% of the nurses had good knowledge of the justifications for neurological assessment, 97% knew the lowest and highest scores, 64% could identify the domains of behavior on the GCS, but 67% were unable to determine a patient's motor responses. However, all of the respondents were able to give accurate answers when given the criteria for judging verbal comments.

Unfortunately, a lot of studies that were done to evaluate nurses' and other doctors' understanding and usage of the GCS have found that they don't know a lot about it. 30% of the participants in the research to gauge Nigerian physicians' understanding of the GCS did not even know what the term meant in its whole [10]. In the same nation, 33% of nurses who participated in the research to gauge nurses' understanding of the GCS had inadequate knowledge [8]. Similar studies done in Malaysia, Jordan, and Iraq similarly found that nurses did not have enough understanding about the GCS [11] and [12].

1.1 Goals of the Research

The study's goal is to identify nurses' knowledge, GCS application, and factors that prevent them from using it to evaluate unconscious patients in the Accident & Emergency Unit, Gynecology Emergency Unit, Intensive Care Unit, Emergency Pediatric Unit, Male Medical, Female Medical, Male Surgical, Female Surgical, and Theatre Unit of Modibbo Adama University Teaching Hospital, Yola (MAUTH). However, the particular goals were to measure the degree of nurses' GCS knowledge at MAUTH and to examine the extent to which nurses at MAUTH used GCS when caring for patients who were unconscious. likewise, to determine what prevents nurses at MAUTH from effectively use GCS.

2. METHODOLOGY

2.1 Research Methods and Tools

An exploratory cross-sectional study was conducted. This allowed the researcher to assessed the utilization and the level of knowledge of nurses in Modibbo Adama University teaching hospital. Questionnaires were utilized as a data gathering tool. There were four (4) sections to the questionnaire. data

from Section A, the sociodemographic, Section B contains knowledge of nurses on GCS, Section C utilization of GCS among nurses, section D perceived hindrances to utilization of GCS among nurses. The questionnaire was written in English language and the researcher was present during the distribution of the questionnaire to clarify questions which may be asked by the participants. To establish the reality of the instrument, pilot test was done on 10 staff of Specialist hospital Yola and the result was 90%.

2.2 Research Population and Sampling

The study's 195 participants were registered nurses with 1 to 15 years of nursing experience who worked in Yola's Modibbo Adama university teaching hospital's emergency paediatric unit, gynecological emergency unit, intensive care unit, male and female medical wards, male and female surgical I&II, and female surgical departments. The sample size for this investigation was established using the Taro Yamanes formula [13].

where n is the sample size
e=level of significance, N=population
The sample size is n=131. Convenient sampling techniques was used to select 131 respondents of the study

2.3 Analysis of Data

The acquired data was analyzed using straightforward percentages by dividing the value by the sum of the values, multiplying the result by 100. The percentage of proportions of individuals were calculated based on their responses and presented in frequency distribution table.

3. RESULTS

3.1 Demographic Data of Respondent

The findings revealed that majority of the respondents 70 (60%) are female, 40 (34%) are above the age bracket of 34 – 37 years, 49 (42%) poses post basic nursing qualification, 28 (24%) are NO II, 49 (42%) have 1-5 years working experience, 23 (20%) are working in surgical ward, 44 (38%) specialized in Medico-surgical nursing.

Table 1. Demographic data of respondent n= 117

Variable	Option	Frequency	Percent
Sex	Male	47	40
	Female	70	60
	22 -25	17	15
	26 – 29	26	22
	30 – 33	32	27
	34 – 37	2	2
	38 above	40	34
Qualification	Nursing Diploma	18	15
	Basic Nursing	34	29
	Post Basic Nursing	49	42
	BNSc.	14	12
	MSc. Nursing	2	2
Job Status	Staff Nurse	14	12
	NO II	28	24
	NO I	25	21
	SNO	23	20
	PNO	6	5
	ACNO	7	6
	CNO	13	11
	ADNS	1	1
Experience at work in years	1 – 5	49	42
	6 – 10	29	25
	11 – 15	15	13
	> 15	24	20
Area of Practice	A & E	13	11
	ICU	12	10
	EPU	10	9
	Gynaecology	10	9
	Medical	18	15
	Surgical	23	20
	HDU	5	4
	Operating Theatre	19	16
Specialty	A & E	13	11
	Critical Care	11	9
	Paediatrics	5	4
	Burns & Plastic	2	2
	Midwifery	23	20
	Perioperative	17	14
	Anaesthesia	2	2

Source work field 2022

3.2 Knowledge, Utilization and Perceived Factors that Hinder Effective Utilization of GCS

level of knowledge on GCS: Table 2 shows that half of the respondents 58(50%) had formal training on GCS post registration more than 1 year ago, majority of the respondents 108(89%) said the GCS's purpose is to determine level of consciousness, 94(80%) said the three elements of GCS are: Best verbal response, eye opening, and best motor response, 108(92%) said the Glasgow coma scale ideal result is 15, 65(56%) said the Glasgow coma scale's lowest rating is 3, 78(67%) said the critical circumstance that the examiner should be aware of is indicated by a GCS score of ≤5, 70(60%) said when documenting GCS, presence of endotracheal intubation and eyelid oedema should be mentioned, 59(50%) said the results indicating a moderate head injury range from 12-9, 52(44%) said the best appropriate response for score while using GCS is The patient's initial response, 45(38%) said To evaluate the eye-opening while using GCS, the examiner should start by Calling out the patient's name, 77(66%) said to evaluate

the best verbal response while using GCS, the examiner should start by basic inquiries regarding one's environment, time and self, 63(54%) said to evaluate the best motor response while using GCS, the examiner should start by a verbal request for a motor response, 65(56%) said in GCS, it's critical to record: grading every indicator, overall score, and providing explanations as needed.

Utilization of Glasgow coma scale in the care of unconscious patient: Table 2 also reveals that the vast majority of responders 108(92%) had provided treatment for a patient who required a GCS evaluation due to an altered level of consciousness, 84(72%) said the frequency of GCS performance is daily, 72(62%) strongly believe it is crucial to determine and document a GCS for each patient whose mental state has changed, 92(82%) said yes, reporting the GCS form part of their routine handover to other nurses, 91(78%) indicated head injury as conditions for which they would use GCS to assess the patient.

Factors that hinder effective utilization of GCS: Table 2 further shows that majority of the respondents 104(94%) said yes, Lack of in-service instruction regarding the GCS and Knowledge deficit is among the hinderance to effective utilization of GCS, 104(94%) said yes, lack of a clear chart for scoring patients is among the hinderance to effective utilization of GCS, 84(74%) said yes, lack of self-confidence on the use of GCS is among the hinderance to effective utilization of GCS, 103(88%) said yes, Lack of understanding on how to use GCS is among the hinderance to effective utilization of GCS, 78(67%) said yes, Shortage of nurses is among the hinderance to effective utilization of GCS, while the remaining 39 (33%) said no.

Table 2. Level of knowledge on GCS n= 117

S/N	VARIABLES	Option	Frequency	Percent
1	Do you have any Formal GCS post- registration training?	No	52	44
		Yes, >1 year post registration	58	50
		Yes <1 year post registration	6	5
		Yes, <6months post registration	1	1
2	What is the purpose of Glasgow coma scale?	To determine level of consciousness	104	89
		To determine cognitive changes	4	3
		To determine cognitive level of knowledge	9	8
3	What are the three elements of the Glasgow Coma Scale?	Eye opening, best motor response and pupil response	12	10
		Eye opening, motor impairment and best verbal response.	11	9
		Best verbal response, eye opening, and best motor response	94	80
4	Glasgow coma scale: The ideal result is	15	108	92
		13	4	3
		8	3	3
		5	2	2
5	The Glasgow coma scale's lowest rating is	4	5	4
		3	65	56
		1	13	11
		0	34	29
6	A critical circumstance that the examiner should be aware of is indicated by a GCS score of	GCS ≤15	1	1
		GCS ≤ 8	26	22
		GCS ≤ 7	12	10
		GCS ≤ 5	78	67
7	The following criteria should be stated when documenting GCS (choose all that apply)	Endotracheal intubation is present and eyelid swelling	70	60
		Hemodynamic and respiratory stability	32	27
		Neuromuscular blockage and Sedatives use	21	18

S/N	VARIABLES	Option	Frequency	Percent
8	GCS outcome can be categorized into three groups: mild, moderate and severe. Results indicating a moderate head injury range from	8-3	35	30
		15-13	20	17
		12-9	59	50
		14-8	3	3
9	The best appropriate response for score while using GCS is:	The patient's initial response	52	44
		The patient's best response	48	41
		The patient's last response	17	15
10	To evaluate the eye-opening while using GCS, the examiner should start by:	Asking the patient to open his/her eyes verbally	39	33
		Calling out the patient's name	45	38
		Using unpleasant stimuli	16	14
		Standing close to the patient's bed	17	15
11	To evaluate the best verbal response while using GCS, the examiner should start by:	Asking various questions	19	16
		Basic inquiries regarding one's environment, time and self	77	66
		Enquiring about the patient's pain's location	21	18
12	To evaluate the best motor response while using GCS, the examiner should start by:	A verbal request for a motor response	63	54
		The utilization of unpleasant stimuli	43	37
		Looking at the strength of the muscles	2	1
		Looking at the range of motion	9	8
13	In GCS, it's critical to record:	Just the overall score	20	17
		An explanation of the results obtained	6	5
		Grading every indicator	26	22
		Grading every indicator, overall score, and providing explanations as needed	65	56

Source work field 2022

Table 3. Utilization of Glasgow coma scale in the care of unconscious patient n=117

S/N	VARIABLES	Option	Frequency	Percent
1	Have you ever provided treatment for a patient who required a GCS evaluation due to an altered level of consciousness?	Yes	108	92
		No	9	8
2	Frequency of GCS performance:	Daily	84	72
		Weekly	10	23
		Occasionally	16	14
		Almost neve	7	6
3	Do you believe it is crucial to determine and document a GCS for each patient whose mental state has changed?	Strongly agree	72	62
		Agree	27	23
		Neither agree nor disagree	8	7
		Disagree	7	6
		Strongly disagree	3	2
4	Does reporting the GCS form part of your routine handover to other nurses?	YES	96	82
		NO	21	18
5	List the patient conditions that you would evaluate using GCS in the space provided below.	Head injury	91	78
		Unconscious patient	58	48
		COPD	1	1

S/N	VARIABLES	Option	Frequency	Percent
		Eclampsia	11	9
		CKD	2	1
		Patient with seizure that is under sedation	1	1
		Shock	11	9
		CVA	8	7
		Stroke	16	14
		Acute medical and trauma condition	9	8
		Mentally ill patient	3	2
		Low APGAR score baby	1	1
		Spontaneous intra-cebral hemorrhage	1	1
		Cardiac arrest	4	3
		Brain abscess	3	2
		Cerebral Malaria	6	5
		Diabetic coma	9	8
		Patient with multiple organ failure	1	1
		Delay recovery from anesthesia	3	2
		Drug poisoning	2	1
		Severe burns	1	1
		Post-operative patient	4	3
		Typhoid psychosis	1	1
		Diabetic ketoacidosis	3	2
		Snake bite	1	1

Source work field 2022

Table 4. Factors that hinder effective utilization of GCS n=117

S/N	VARIABLES	Option	Frequency	Percent
1	Lack of in-service instruction regarding the GCS and Knowledge deficit.	Yes	110	94
		No	7	6
2	Lack of a clear chart for scoring patients:	Yes	98	84
		No	19	16
3	Lack of self-confidence on the use of GCS:	Yes	86	74
		No	31	26
4	Lack of understanding on how to use GCS:	Yes	103	88
		No	14	12
5	Shortage of nurses:	Yes	78	67
		No	39	33

Source work field 2022

4. DISCUSSION

4.1 Level of Knowledge on GCS among nurses at MAUTH Yola South L.G.A Adamawa State

In this study majority of the respondents had formal training on GCS post registration. The finding seems to be in disparity with that of Kimboka [14], who reported that around half of nurses in her study had never attended any type of training. It is also in contrast to the finding of [15], who reported that The vast majority of participants had not undergone any GCS refresher training.

In this study majority of the respondents appropriately responded to questions regarding GCS that related to the scale's purpose (or objective), its parameters, score, the standards that should be specified when documenting GCS, as well as the range of the scale that

defined GCS as moderate. Additionally, they provided accurate information on how to begin evaluating the best verbal and best motor responses, as well as how to grade each characteristic. The majority of research participants had strong knowledge of the GCS, although some of them had limited understanding of the scale score that denoted a critical condition for the patient. However, when participants were questioned about the proper approach to judge eye openness, only 15% of them selected the correct response. These findings are in line with what was reported in a previous study by Reith et'al [16] which shows that Participants had inadequate awareness of several scale factors, demonstrating the necessity for ongoing training to ensure the consistent and reliable use of GCS. This finding is almost close to that reported by Santos et'al [17], In which questions concerning the GCS's purpose, parameters, score, scale score that indicated a serious condition for the patient and that the examiner should be aware of, as well as questions about the scale interval that categorized BTI as moderate, were properly answered by more than 80% of the nurses. Additionally, they provided accurate information on how to begin evaluating the best verbal and best motor responses, as well as how to grade each characteristic. Although the majority of the nurses in our survey had strong understanding of the GCS, several experts lacked such expertise. Only 39.4% of survey participants who were asked how to accurately measure eye opening picked the correct response. This discovery is in contrast with what was reported by Alhassan et'al [15], Over half of the participants in the research, or 50.4%, showed insufficient understanding of the Glasgow Coma Scale (GCS), which involved 115 nurses working in a tertiary hospital in Ghana. Participants got a mean score of 11.99 and a standard deviation of 3.70 out of a potential range of values from 0 to 20. The GCS evaluation is poorly understood by nurses. The lowest GCS score was unknown to more than half of the study's nurse participants. They were unable to pinpoint which GCS score indicated that a patient had a serious neurological problem. The finding is also in disparity to that of Ali et'al [18] on Nurses knowledge and practice regarding GCS techniques implementation at the ICUs and emergency department of a tertiary care hospital of Lahore, according to the study, a lot of participants did not have sufficient knowledge of GCS implementation techniques in the ICU and emergency departments. According to facts and

figures, only 34.3% of nurses have sufficient knowledge on GCS implementation techniques, on the other hands, 65.7% of the population did not know about GCS implementation techniques. The finding of this study seems to be in disparity with research conducted in Jordan, nurses don't have the fundamental understanding of the GCS [12]. and also, with research conducted at the University of Malaya in Kuala Lumpur, Malaysia, 55.56% of nurses had inadequate knowledge, 41.48% had satisfactory knowledge, and 2.96% had high knowledge. However, it was in line with a study conducted in Nigeria to evaluate nurses' knowledge of the GCS. The study's findings showed that 41.7% of respondents had good knowledge, 25% had moderate knowledge, and 33% had poor knowledge of the GCS when it came to neurological patient assessments in a chosen tertiary hospital [8]. The finding in this study is in contrast with the findings of related studies done in Malaysia, Jordan, and Iraq that likewise revealed nurses' poor understanding of the GCS [11] and [12].

4.2 Utilization of GCS during the Care of Unconscious Patient Among clinical nurses at MAUTH Yola South L.G.A Adamawa State

Majority of the respondents said they have tended to a patient who needed a GCS evaluation and had an altered degree of awareness. This may not be unconnected with the wards and unit where the respondents are working. The results also showed that most of the respondents said the frequency of GCS performance is daily and also strongly agreed every patient with changed mental state has to have their GCS evaluated and recorded. The findings further revealed that, reporting the GCS is part of their standard handover to other nurses. and also 78% of them indicated head injury as conditions for which they would use GCS to assess the patient. This finding is backed by the finding of a research carried out by Jonita & Larissa [18], whose findings shows that majority of the respondents 98.3% always did reassessment of GCS based on protocol. Every subject consistently completed Glasgow Coma Scale paperwork in accordance with policy and kept the material on sites. The study also revealed that every responder assessed all three components during each evaluation and used the GCS in the emergency room and intensive care unit. The finding is also in line with that of Kimboka [14], She stated that the GCS is used by nurses to evaluate various conditions.

Patients with a brain tumor (5.7%), CVA/stroke (31.0%), altered state of consciousness patients (1.3%), unconscious patients (29.7%), trauma patients (15.8%), very sick patients (12.7%), patients with any disturbed mental status (12.7%), patients with a head injury (55.7%), and seriously ill patients were also included in this group. On the other hand, the finding in this study is in contrast with the findings of similar studies conducted in Brazil by Santos et'al [17] in a university hospital in So Paulo, Brazil, which revealed low adherence to GCS use, challenges with its application, and failures of professionals related to consciousness evaluation, such as a lack of standards and inadequate knowledge of the scale.

4.3 Hindrances to Effective Utilization of GCS Among nurses in MAUTH Yola South L.G.A Adamawa State

Vast majority of the respondents indicated that lack of in-service instruction regarding the GCS and knowledge deficit and also lack of a clear chart for scoring patients is among the hinderance to effective utilization of GCS. this finding is in agreement with Kimboka [14] who stated that the nurses said that their inability to accurately assess patients was hampered by their lack of understanding and in-service training on the GCS evaluation and implementation. This might result in critically sick patients receiving care that is of subpar quality. As a result of the majority of nurses in the examined locations, such as the emergency medicine department (EMD), not having access to a GCS chart, which is frequently used as a reference tool for assessment, it was also observed that a lack of resources was a problem that interfered with GCS assessment. The GCS is recorded by the EMD using a computer system, but it is not kept with the paperwork of the vital signs. It is under a different part called "Trauma Score", if the patient has not had a trauma, the nurses might not consider to employ it. The computer system utilized for the EMD does not require or urge completion of GCS. Additionally, there is no chart in the rooms for the nurses to consult if they forget a GCS component. The results concur with those of Chan et al [20]. He stated that a number of factors affect the nursing care and evaluation results obtained when the GCS is applied. These include lacking information, a negative attitude, a lack of confidence, a lack of education, and demographic variables like age and gender. In a research on the knowledge, attitudes, and self-confidence patterns of nurses

to execute the conscious level assessment, conducted at Singapore National University, same characteristics were discovered. Younger nurses were shown to be more proficient in utilizing the GCS. According to several research, well trained nurses used the GCS more consistently and accurately. Comparatively speaking, recently graduating nurses and student nurses performed less accurately than nurses who received formal training in the use of the GCS [21]. The results concur with those of Santos et al. [17], who hypothesized that a lack of standards and a lack of familiarity with the scale are among the obstacles to its use. Only 42.7% of nurses utilize this scale to evaluate awareness, which suggests that the hospital routine prioritizes other biological systems.

The strength of this findings lies in its methodology, and also based on the fact that it is the first study in the North-eastern Nigeria based on the researcher's knowledge, and it also has a significant number of participants. The weakness of this study is that, it is a cross sectional research and also data was gathered at a single tertiary health facility.

5. CONCLUSION

The GCS must be accurately carried out to guarantee patient safety. From the findings of this study, it is obvious that most of those surveyed had solid understanding. About GCS it could be related to their level of education and post registration training on GCS. Over fifty percent of the nurses was unaware of the scale score that pointed to a crucial circumstance for the patient that the examiner need to be aware of. Majority of respondents reported Lack of understanding on how to use GCS and lack of a clear chart for scoring patient's GCS prevented them from using the GCS in their regular practice. These elements, along with a lack of expertise, will restrict their ability to analyze, use clinical judgment, and make decisions while handling unconscious patients.

CONSENT AND ETHICAL APPROVAL

As per international standard, the researcher sought ethical clearance from Modibbo Adama university teaching hospital, Yola research and ethics committee with reference number; MAUTHY/SUB/S.128/191. Permission to conduct the study was obtained from the director of clinical services Modibbo Adama University teaching hospital, Yola, and finally from the unit

heads of the selected wards at the facility. Written informed consent was also obtained from study participants and was assured of anonymity and confidentiality throughout the study.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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