KNOWLEDGE AND UTILIZATION OF GLASGOW COMA SCALE IN EVALUATING UNCONSCIOUS PATIENTS AMONG NURSES IN A NIGERIAN REFERRAL HEALTH CENTRE

ABSTRACT

Introduction: *Glasgow Coma Scale (GCS) is the corner stone of the neurological assessment of patients used by both nursing and medical staff. The study was conducted to determine the knowledge, utilization and factors which inhibit nurses in the application of the GCS to assess unconscious patients at Modibbo Adama University Teaching Hospital, Yola. Adamawa state, Nigeria.* ***Materials and Methods:*** *The study utilized descriptive research cross-sectional design. Taro Yamane's formula was used to estimate the sample size for the study, 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 respondents had good knowledge of GCS, 88% and 84% of the respondents respectively reported that lack of knowledge on the application of GCS and lack of self-confidence on the use of GCS were the main factors that hindered them to their ability to use the GCS in their daily 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 there is need for Nurses to put more effort into updating their knowledge, as well as practice on the GCS assessment, and management should formulate an educational team to assess, teach and ensure that nurses adhere to using the GCS correctly.*

Keywords: Knowledge, Utilization, Glasgow Coma Scale, Unconsciousness, nurse

1. INTRODUCTION

The Glasgow Coma Scale (GCS) was first published in 1974 at the University of Glasgow by neurosurgery professors Graham Teasdale and Bryan J. Jennet. The GCS is used to objectively describe the extent of impaired consciousness in all types of acute medical and trauma patients. Assessing and documenting the level of consciousness are considered primary actions of doctors and nurses who care for the patients with neurological or neurosurgical problems. The assessment helps to identify the patients' neurological problems and evaluate health interventions. According to Hien & Chae [1], it can be an indicator of the need for intervention or treatment in emergency conditions.

The use of GCS requires previous knowledge and skills. This scale, if applied carefully and systematically is fundamental for assessment and establishment measures of the patient in order to guarantee reliability – which is critical to follow-up the progress of such patients [2]. For many years, a variety of studies were developed to evaluate the precision and reliability

of GCS. Settervall & Sousa [3] studies, shows low adherence of GCS use, difficulties in its application and fails of professionals related to conscience evaluation such as lack of standards and poor knowledge about the scale, in addition, the hospital routine is a fact that led prioritization of other organic systems, indicating that only 42.7% of nurses use this scale to assess consciousness. To assess level of consciousness is part of health professional's routine, mainly those working at critical care units, *i.e.*, emergency services (ES) and intensive care units (ICU), who are well trained and more experienced in the use of GCS with higher levels of reliability and precision [4].

The scale assesses patients according to three aspects of responsiveness: eye-opening, motor response and verbal response. Reporting each of these separately provides a clear, communicable picture of a patient's state. Active and meaningful verbal communication is very important part when it aims to deliver excellent care to the patient in the health care setting [5].

The Glasgow Coma scale assigns numeric values which ranges from 1 to 5 for each activity that comprises eye-opening, best motor response, and best verbal response to measure the level of awareness and responsiveness. GCS scale affords the score which ranges from 3 to 15. The patients with scores of 3 to 8 are usually said to be in neurological injuries like a coma. The lowest possible GCS is three which may be deep coma or death, while the highest is 15 which means fully attentive and oriented [6].

GCS knowledge and use among health professionals in Nigeria and Africa have been understudied. Among the few published works was a study by Yusuf *et'al* [7] whose studies was to assess physicians' knowledge of GCS among 141 doctors at a teaching hospital in Ilorin Kwara State, Nigeria. They used questionnaire as instrument for data collection, their study revealed that majority of the respondents (97%) could indicate correctly what GCS stands for and identify each category correctly. However, there was overall poor performance in scoring of the components of GCS by respondents. For instance, only 53 (37%) scored all the categories correctly. Yusuf *et'al* [7], reported that more of the physicians (41%) who had undergone training in these specialties were able to recall and score the categories of GCS correctly than those (31%) that had not (cited in [8]).

A study to evaluate clinical nurses' use of Glasgow coma scale in a selected teaching hospitals in Osun State, Nigeria by Ogunfowokan et'al [9] revealed that 83% of the nurses had good knowledge on the reasons for neurological assessment, 97% knew the lowest and the highest scores, 64% could identify the domains of behaviour on the GCS while 67% did

not know how to determine motor responses on a patient. However, all the respondents were able to respond correctly to the parameters used in determining verbal responses.

Unfortunately, many studies that have been conducted to assess knowledge and practice of nurses and other clinicians about the GCS have reported poor knowledge about this important tool. In a study to assess the knowledge of Nigerian physicians about the GCS, 30% of the participants did not even know the full meaning of GCS [10]. In the same country, 33% of nurses in a study to assess nurses' knowledge of the GCS had poor knowledge [8]. Similar studies conducted in Malaysia, Jordan, and Iraq also reported inadequate knowledge of the GCS among nurses [11] & [12].

1.1 Aim of the Study

The aim of the study is to determine the knowledge, utilization and factors which inhibit nurses in the application of the GCS to assess unconscious patients in the Accident & Emergency Unit, Gynae Emergency Unit, I.C.U, Emergency Pediatric Unit, Male Medical, Female Medical, Male Surgical, Female Surgical and Theatre Unit of Modibbo Adama University Teaching Hospital, Yola (MAUTH). However, the specific objectives were: to assess the level of nurses' knowledge on GCS at MAUTH, to evaluate the level of utilization of GCS in the care of unconscious patient among nurses at MAUTH. And to identify factors that hinder effective Utilization of GCS among nurses at MAUTH.

2.0 RESEARCH METHOD

2.1 Research Design and Instrument

Cross-sectional descriptive survey was used. This will allow the researcher to assess the utilization and the level of knowledge of nurses in Modibbo Adama University teaching hospital. Questionnaires was used as instrument for data collection. The questionnaire was divided into four (4) sections. Section A socio- demographic data, 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 Study population and Sampling

The population of this study was registered nurses with 1-15 years of nursing experience, working in the accident & emergency unit, gynae emergency unit, I.C.U, emergency paediatric unit, male medical, female medical, male surgical I&II, female surgical, high dependence unit and theatre unit of Modibbo Adama university teaching hospital, Yola,

totaling 195. Taro Yamanes formula [21], was used to determine the sample size for this study

$$n = \frac{N}{1 + N(e)^2}$$

Where;

n=sample Size

N=population

e=level of significance $(0.05)^2$

n (sample size) = 131. Convenient sampling techniques was used to select 131 respondents of the study

2.3 Data Analysis

The data collected was analysed using simple percentages by dividing the value by the total value and then multiplying the result by 100 i.e $(\frac{Value}{Totalvalue} X100)$. The percentage of proportions of individuals were calculated based on their responses and presented in frequency distribution table.

3.0 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.

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 function of GCS is to evaluate level of consciousness, 94(80%) said the three components of GCS are: eye opening, best verbal response, and best motor response, 108(92%) said the best score for the scale is 15, 65(56%) said the worse score for the scale is 3, 78(67%) said the GCS score that indicates a critical situation the examiner should be alert to is GCS ≤5, 70(60%) said when documenting GCS, presence of endotracheal intubation and eyelid oedema should be mentioned, 59(50%) said the results of GCS that indicate a moderate head injury are between 12-9, 52(44%) said during the use of GCS, the most adequate response for the score is the first response presented by the patient, 45(38%) said to assess eye opening, the examiner should begin with calling the patient's name in a loud

voice, 77(66%) said to assess the best verbal response, the examiner should begin with asking simple questions about location, time and self, 63(54%) said to assess the best motor response, the examiner should begin with a verbal command requesting a motor response, 65(56%) said in GCS it is important to document scoring of each indicator, total score, and describe when necessary.

Utilization of GCS in the care of unconscious patient: Table 2 also shows that majority of the respondents 108(92%) had cared for a patient with altered level of consciousness who required assessment of GCS, 84(72%) said the frequency of GCS performance is daily, 72(62%) strongly agreed that it is important to assess and record a GCS for every patient who has altered mental status, 92(82%) said yes, their normal handover to other nurses include reporting the GCS, 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 knowledge and lack of in-service training on the GCS 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 knowledge on the application of 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 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
Work Experience	1 – 5 Years	49	42
	6 – 10 Years	29	25
	11 – 15 Years	15	13
	> 15 Years	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

Table 2: Level of knowledge on GCS n= 117

S/N	VARIABLES	Option	Frequency	Percent
1	**Have you had any Formal training on GCS post registration?**	No	52	44
		Yes, >1 year ago	58	50
		Yes <1 year ago	6	5
		Yes, <6months ago	1	1
2	**What is the function of GCS?**	Evaluate level of consciousness	104	89
		Evaluate cognitive changes	4	3
		Evaluate cognitive level of knowledge	9	8
3	**Three components of GCS are**	Eye opening, pupil reaction, and best motor response	12	10
		Eye opening, best verbal response, and motor deficit	11	9
		Eye opening, best verbal response, and best motor response	9	8
4	**Best score for the scale is**	15	108	92
		13	4	3
		8	3	3
		5	2	2
5	**Worse score for the scale is**	4	5	4
		3	65	56
		1	13	11
		0	34	29
6	**A GCS score that indicates a critical situation the examiner should be alert to is**	GCS ≤15	1	1
		GCS ≤ 8	26	22
		GCS ≤ 7	12	10
		GCS ≤ 5	78	67
7	**When documenting GCS, the following criteria should be mentioned (select all which is applicable)**	Presence of endotracheal intubation and eyelid edema	70	60
		Respiratory and hemodynamic stability	32	27
		Use of sedatives and neuromuscular blockage	21	18
8	**GCS results can be divided into three categories – mild, moderate and severe. The results that indicate a moderate head injury are between**	8-3	35	30
		15-13	20	17
		12-9	59	50
		14-8	3	3
9	**During the use of GCS, the most adequate response for the score is:**	The first response presented by the patient	52	44
		The best response presented by the patient	48	41
		The last response presented by the patient	17	15
10	**To assess eye opening, the examiner should begin with:**	Verbally requesting the patient to open his/her eyes	39	33

		Calling the patient's name out loud	45	38
		Using painful stimuli	16	14
		Standing next to the patient's bed	17	15
11	**To assess the best verbal response, the examiner should begin with:**	Making different questions	19	16
		Asking simple questions about location, time and self	77	66
		Asking the patient about pain location	21	18
12	**To assess the best motor response, the examiner should begin with:**	A verbal command requesting a motor response	63	54
		The use of painful stimulus	43	37
		Observing muscle strength	2	1
		Observing the range of movement	9	8
13	**In GCS it is important to document:**	Only the total score	20	17
		Describing responses obtained	6	5
		Scoring each indicator	26	22
		Scoring each indicator, total score, and describe when necessary	65	56

Source work field 2022

Table 3: Utilization of GCS in the care of unconscious patient n=117

S/N	VARIABLES	Option	Frequency	Percent
1	**Have you ever cared for a patient with altered level of consciousness who required assessment of GCS?**	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 think it is important to assess and record a GCS for every patient who has altered mental status?**	Strongly agree	72	62
		Agree	27	23
		Neither agree nor disagree	8	7
		Disagree	7	6
		Strongly disagree	3	2
4	**Does your normal handover to other nurses include reporting the GCS?**	YES	96	82
		NO	21	18
5	**Please list below patient conditions for which you would assess using GCS.**	Head injury	91	78
		Unconscious patient	58	48
		COPD	1	1
		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 knowledge and lack of in-service training on the GCS:**	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 knowledge on the application of GCS:**	Yes	103	88
		No	14	12
5	**Shortage of nurses:**	Yes	78	67
		No	39	33

Source work field 2022

4.0 DISCUSSION

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 [13], 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 [14], who reported that a large majority of the participants had not received any refresher training on the GCS.

In this study majority of the respondents answered correctly questions about GCS concerning the function (aim) of the scale, parameters, score, the criteria that should be mentioned when documenting GCS and also about the scale interval that classified GCS as moderate. They also answered correctly how to score each parameter, and how to begin the assessment of best verbal response and best motor response. Although majority of respondents in this study showed a good knowledge about GCS, some of them had poor knowledge about the scale score that indicated critical situation for the patient. However, only 15% chose the right answer when participants was asked about correct way to assess eye opening. These findings are in line with what was reported in a previous study by Reith *et'al* [15] which shows that participants showed poor knowledge in some parameters of the scale, which indicated the need of continuous training in order to guarantee standard and reliable use of GCS. The finding is almost close to that reported by Santos *et'al* [16], in which more than 80% of the nurses answered questions about GCS correctly on the aim of the scale, parameters, score, scale score that indicated critical situation for the patient and that examiner should be alert to, and also about the scale interval that classified BTI as moderate. They also answered

correctly how to score each parameter, and how to begin the assessment of best verbal response and best motor response. Although the majority of nurses of our study showed a good knowledge about GCS, some professionals had poor knowledge about the scale. When participants in our study were inquired about correct way to assess eye opening, only 39.4% chosen the right answer. This finding is in contrast with what was reported by Alhassan et'al [14], on Knowledge of the Glasgow Coma Scale among 115 nurses in a tertiary hospital in Ghana more than half of the participants 50.4% in the study demonstrated poor knowledge about the GCS. Out of a possible range of scores from 0 to 20, participants had a mean score of 11.99 with a standard deviation of 3.70. Nurses have a low level of knowledge about the GCS assessment. More than half of the nurses that participated in the study did not know the lowest score for the GCS. They could not identify which GCS score indicated a patient was in a critical neurological condition. The finding is also in disparity to that of Ali et'al [17] 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 that of A study in Jordan which showed that nurses lack the basic knowledge about the GCS [12] and also, with a study done at the university of Malaya, Kuala Lumpur, Malaysia, which results showed that 55.56% of nurses had poor knowledge, followed by 41.48% with satisfactory knowledge and 2.96% with good knowledge. But it is in agreement with a study done in Nigeria to assess nurses' knowledge of the GCS, in the neurological assessment of patients in a selected tertiary hospital, the results showed that 41.7% of the respondents had good knowledge; 25% had moderate knowledge; and 33% of nurses in the study had poor knowledge [8]. The finding in this study is in contrast with the findings of similar studies conducted in Malaysia, Jordan, and Iraq which also reported inadequate knowledge of the GCS among nurses [11] & [12].

Utilization of GCS in the Care of Unconscious Patient Among nurses in MAUTH Yola South L.G.A Adamawa State.

Majority of the respondents said they have cared for a patient with altered level of consciousness who required assessment of GCS. This may not be unconnected with the wards and unit where the respondents are working. The findings also revealed that majority of the

respondents said the Frequency of GCS performance is daily and also strongly agreed it is important to assess and record a GCS for every patient who has altered mental status. The findings further revealed that, their normal handover to other nurses include reporting the GCS and also 78% of them indicated head injury as conditions for which they would use GCS to assess the patient. This finding is supported by the finding of a study conducted by Jonita & Larissa [18], whose findings shows that majority of the respondents 98.3% always did reassessment of GCS as per protocol. All the subjects always did Glasgow Coma Scale documentation as per the protocol and maintained the Glasgow Coma Scale documentation on sites. The study further showed that all the respondents always use the GCS in the intensive care unit and emergency department and checked all the 3 components during every assessment. The finding is also in line with that of Kimboka [13], who reported that nurses use the GCS to assess several conditions. These conditions included a patient with a head injury (55.7%), CVA/Stroke (31.0%), unconscious patients (29.7%), trauma patients (15.8%), seriously ill patients (12.7%), any patient with altered mental status (12.7%), brain tumor (5.7%) and altered level of consciousness patients (1.3%). 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 [16] on the assessment of nurse's knowledge of the Glasgow Coma Scale at a university hospital São Paulo, Brazil, which shown a low adherence to GCS use, difficulties in its application and failures of professionals related to consciousness evaluation, such as lack of standards and poor knowledge about the scale.

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 knowledge and in-service training on the GCS 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 [13] who stated that lack of knowledge and lack of in-service training on the GCS assessment and application were reported by the nurses to be factors that decreased their ability to assess patients correctly. This may contribute to inadequate quality care being delivered to critically ill patients. In addition to that, lack of resources was also reported to be a factor which interfered with GCS assessment because most of the nurses in the studied areas, such as the emergency medicine department (EMD), were lacking a GCS chart which is used regularly as a reference tool for assessment. The EMD uses a computer system to record the GCS, but it is not located with the vital signs documentation. It is in a separate section, entitled "Trauma Score", which the nurse may not think to use, if the patient has not been involved in a trauma.

There is no prompt or mandatory completion of GCS in the computer system used in the EMD. Along with this, there is no chart in the rooms for nurses to refer to if they forget a component of the GCS. The findings are also in line with that of Chan et'al [19] who reported that there are several factors that determine the nursing care and assessment achieved during application of the GCS. These include inadequate knowledge, attitude, lack of self-confidence, educational background and demographic factors such as age and gender. Similar factors were found in Singapore national University in a study done on investigating nurses" knowledge, attitudes and self-confidence patterns to perform the conscious level assessment, where by younger nurses were more accurate in using the GCS. Some studies reported that well-trained nurses were more consistent and accurate in use of the GCS. Nurses who had formal training in the use of the GCS were more accurate as compared with newly graduated nurses and student nurses [20]. The finding is also in agreement with the findings of Santos et'al [16] who postulated that lack of standards and poor knowledge about the scale are among the hindrance to its utilization. In addition, the hospital routine leads to prioritization of other organic systems, indicating that only 42.7% of nurses use this scale to assess consciousness.

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 study and also the data was collected in only one tertiary health facility.

5.0 CONCLUSION

To ensure patient safety, the GCS has to be performed accurately. From the findings of this study, it is obvious that most of the respondents have good knowledge about GCS this may be related to their level of education and post registration training on GCS. More than half of the nurses did not know the scale score that indicated critical situation for the patient, that examiner should be alert to**.** Majority of the respondents reported lack of knowledge on the application of GCS and lack of a clear chart for scoring patient's GCS hindered their ability to use the GCS in their daily practice. These factors, together with inadequate knowledge will limit their capacity for assessment, clinical judgment and decision making in managing 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.

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