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Original Article

Practice and associated factors of Glasgow Coma Scale assessment among nurses working in adult intensive care units of federally administered hospitals in Addis Ababa, Ethiopia

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ABSTRACT

Background & Aim: The Glasgow Coma Scale is a helpful instrument for measuring patients' level of consciousness with neurosurgical disorders. Literature showed a majority of nurses don't believe the Glasgow Coma Scale assessment is their area of practice. This study aimed to examine the Glasgow Coma Scale assessment practice and associated factors among nurses working in adult intensive care units of federally administered hospitals.

Methods & Materials: Institutional-based cross-sectional study was conducted on conventionally selected 126 nurses working in adult intensive care units. Six clinical scenarios were used to assess practice, and those who correctly answered at least four scenario questions out of 6 practical scenario questions for the Glasgow Coma Scale assessment were considered good practice. Data was collected using a self-administered questionnaire. The Chi-square test was applied to examine the variables affecting Glasgow Coma Scale practice. Furthermore, the proportions of categorical variables' replies were contrasted among the various groups.

Result: With a response rate of 96.03%, 121 nurses participated in the study. (53.7%) was males. In this study, the overall good Glasgow Coma Scale assessment practice of intensive care units nurses was 47.1%. Lack of training (77.7%), job overload (73.6%), and insufficient knowledge and skills (61.2 %) are barriers for nurses to assess Glasgow Coma Scale.

Conclusion: In this, only nearly half of the participants displayed good practice on the Glasgow Coma Scale. Sex and educational status were both found to be significant factors in nurses' Glasgow Coma Scale assessment practice.

Introduction

The Glasgow Coma Scale (GCS) is a neurological scale that is used to quantify and record a person's degree of consciousness during first and subsequent patient assessments. It is the first standardized neurological tool for assessing patients' level of consciousness (1, 2). It has primarily been used to assess prognosis, compare different groups of patients, and track neurological status. Since its inception, GCS has been utilized all around the world to improve communication among health care practitioners by providing a uniform reporting language. It was used in different clinical specializations and research endeavors to determine consciousness (3, 4). The three components of GCS are eye-opening, best verbal response, and best motor response. The scale is numerical, with total scores ranging from 3 to 15 on a scale of one to fifteen.

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Giving a clear, communicable picture of a patient's condition by reporting each one separately as well as summarizing delivers a clear, communicable picture of a patient's condition. The total score is used to classify head injuries as mild (13-15), moderate (9-12), or severe (3-8) (5, 6). In patient care, consistent measurement and transmission of the GCS at different times and amongst different observers is critical (7-9). The accurate application of measuring scales in the assessment of patients' awareness status is not only required for determining the patient's prognosis, but also as a basis for decision-making, in clinical setups.

Currently, the Glasgow Coma Scale is a global concern in terms of nurse awareness and clinical practice. Nurses working in critical care should employ assessment of awareness level as easily as other routine observations of vital signs, since a proper neurological assessment is an important aspect of nursing care and critical for the outcome of patients. Failure to assess GCS after a head injury is a common cause of unnecessary mortality and morbidity due to delays in the diagnosis and management of issues (10,11). Several studies have demonstrated, that when nurses do the GCS in a mentorship system, which is a critical component of the evaluation and management of patients suffering from trauma, surgery, or neurological sequelae, they are inconsistent and incorrect. A study conducted in the United States among 217 emergency care professionals discovered that Nurses were the most little precise in their application of GSC accuracy (2,12). Similarly, in Western African countries, nurse practice in GCS assessments is not positive in comparison to the standard of practice that nurses are expected to achieve. Nurses should have the necessary skills, and qualifications to conduct a GCS-based neurological examination (13, 14). This pattern of low awareness and practice of GCS assessment among nurses regarding such a life-saving and simple technology requires attentions, since Nurses work at the forefront of healthcare delivery. In Ethiopia there is difference in the management of patients at intensive care units studies (15) and GCS assessment score is predictor of the survival of patients admitted to the ICU (16) however, there is a scarcity of information about the use of the Glasgow coma scale assessment, particularly among nursing staffs. The aim of this study is to evaluate nurses' practice, and factors impacting GCS evaluation in adult intensive care units at a Federally Administered Public Hospital in Addis Ababa, Ethiopia.

Methods

Study setting & design

The study was conducted in Addis Ababa, the capital of Ethiopia. Currently, there are more than 12 government hospitals and more than 40 private hospitals in the city. Five of the 12 hospitals are managed by the Federal Ministry of Health (FMOH), two by the Army and Police, and five by the Addis Ababa health bureau's city government (17). This study was undertaken at all federally administrated hospitals. The hospitals were chosen for their well-organized adult intensive care unit, which typically admits critically sick patients with altered degrees of consciousness that require regular Glasgow coma scale assessments.

The study was conducted at federally administered hospitals in Addis Abeba, Ethiopia, between April 4 and April 24, 2020, using an institution-based cross-sectional study design.

Participants

All nurses who work in Addis Ababa hospitals that the federal government runs were the source population, and all nurses who work in adult intensive care unit hospitals in Addis Ababa, which the federal government runs, were the study population.

Eligibility Criteria

Nurses who are directly involved in the management of patient care. Nurses with six months or more of experience were no longer on probation and were entirely responsible for patient care were included in this study, and during the study, nurses who were on study leave, maternity leave, or annual leave were excluded.

Sample size

The study included all nurses who worked in the adult intensive care unit of Addis Ababa's federally administered hospitals. There were 126 nurses in total in all five selected hospitals during the data collection period.

Samples & sampling methods

The four hospitals in Addis Abeba under federal administration were deliberately chosen. From these four selected hospitals, nurses were chosen by convenience sampling method. A total of 126 nurses worked in the intensive care unit in those four hospitals (42 nurses each from Black Lion and St. Paulo's hospitals, 22 from ALERT hospital, and the remaining 20 from Peter Hospital).

Data collection tools

This study's questionnaire was adapted from similar research in the past (4, 18-20). The adapted and further developed English language questionnaire was evaluated by a person who attended Master of Arts in the English language for grammatical and sentence flow correctness. The instrument's validity was assessed by the senior neurology clinician who worked at black lion hospital in Addis Ababa. The instrument's reliability was also determined by using Cronbach's alpha using SPSS, which gives the value as 0.67. The data collection tool consisted of three sections. We pre-tested the instrument on a sample of 7 nurses working in the emergency room of Addis Ababa health office administered hospitals.

Section 1: consists of nurses' socio-demographic characteristics.

Section 2: Consists of 6 clinical scenario practice questions about GCS assessment practice. A right answer was given 1, and 0 scores for an incorrect response and the total score was grouped into two levels (the good clinical practice of Glasgow coma scale assessment and poor clinical practice of Glasgow coma scale assessment). The practice of the ICU ward working nurse was determined based on the respondents' answers. There was six scenario question that assessed the practice of nurse GCS assessment. In this study, nurses who correctly answered or implemented at least four scenario questions out of 6 practical scenario questions were considered as good GCS assessment practice, while answers less than 4considered as poor practice of GCS assessment practice.

Section 3: consists of questions that evaluate perceived barrios or factors affecting nurses' assessment of GCS practice.

Data analysis

The data was collected using a pre-tested self-administered questionnaire, then checked, cleaned, and entered into Epi-data version 4.2 before being exported to SPSS version 25 for analysis.

The Chi-square test was applied to look into the variables affecting GCS practice. Furthermore, we contrasted the proportions of categorical variables: replies that were right or wrong among the various groups. Based on the findings of the Chi-square test, variables having a p-value of 0.05 or below were classified as substantially relating to the GCS practice.

Ethical consideration

The research institutional review board of Addis Abeba University provided the

ethical permission. Prior to collecting data, letters of permission was sent to all selected hospitals. The study's participants were given clear information and consent form regarding their right to participate or not. Participants were verbally informed about objective of the study. There was no outright disclosure of the participants' information's confidentiality. They were told that taking part in the study would not hurt them and would instead be beneficial.

Results

Socio-demographic characteristics

With a response rate of 96.03%, 121 nurses working in the AICU of four federally administered hospitals in Addis Ababa were participated in the study. The study included 65 (53.7%) male nurses and 56 (46.3%) female nurses. The participants' ages ranged from 23 to 43 years old, with a mean of 30.07 (STD=4.862). The majority of the participants were between the ages of 25 and 29. (52.9%). A BSc degree was held by 110 (90.9%) of the participants, while an MSc degree was held by 11 (9.1%). In terms of adult ICU experience, 58 (47.9%) of study participants had six (6) months to two (2) years of experience, while only 12 (9.9%) had more than ten years of experience (Table 1).

Table 1. Socio-demographic characteristics of nurses working in AICU in federally administered hospitals, Addis Ababa, Ethiopia (n=121)

Variables		N	%
Age	20-24 years	5	4.1
	25-29 years	64	52.9
	30-34 years	24	19.8
	35-39 years	17	14.0
	40 years & above	11	9.1
Sex	Male	65	53.7
	Female	56	46.3
Level of education	BSc degree	110	90.9
	MSc degree	11	9.1
AICU work experience	6 month-2 years	58	47.9
	3- 5 years	38	31.4
	6-10 years	13	10.7
	10 years & above	12	9.9
Working hospitals	St. peter's	20	16.5
	Alert	21	17.4
	Black lion	40	33.1
	St. Paul's	40	33.1
Too much workload	Yes	89	73.6
	No	32	26.4

Glasgow Coma Scale assessment practice

In this study, the overall good GCS assessment practice of ICU nurses was 47.1%. Only 57 (47.1%) of the study participants correctly assessed at least four of the given six scenario clinical questions (Table 2).

Table 2. Distribution of clinical practice answers on GCS assessment among nurses working in adult intensive care units of federally administered hospitals in Addis Ababa, Ethiopia, June 2020 (n=121)

Scenario	Response	N	%
1. An 18-year-old male is hit on the head with a baseball bat. He withdraws & opens his eyes in response to deep painful stimuli. He mumbles incomprehensibly. The GCS is_____	Correct	57	47.1
	Incorrect	64	52.9
2. An adult unconscious patient flexes his elbow and wrist when pressure is put on the nail bed. However, he does not open his eyes at all and makes grunting noises that are not understood. The GCS is_____	Correct	31	25.6
	Incorrect	90	74.4
3. While traveling to work, a 40-year-old guy gets engaged in a head-on incident. He opens his eyes to the pain in the casualty resuscitation room, mumbles inappropriately, and tries to block the medical officer from inserting a cannula into his arm. The GCS is_____	Correct	22	18.2
	Incorrect	99	81.8
4. A 50-year-old woman jumps from the seventh floor in an attempt to commit suicide. In the casualty resuscitation room, there is no eye-opening or speech. She does not respond when her nail bed is pressed. The GCS is _____	Correct	69	57
	Incorrect	52	43
5. An adult patient in the ICU is seen to obey simple commands and opens his eyes when he hears you speak. He can talk to you in sentences but seems confused and not sure where he is at present. The GCS is_____	Correct	67	55.4
	Incorrect	54	44.6
6. Following head trauma, a 31-year-old man is seen in the emergency department and receives a brief neurological evaluation. He is unable to open his eyes, move his arms or make any spoken sounds. The GCS is_____	Correct	85	70.2
	Incorrect	36	29.8

In this study, the chi-square test revealed sex and educational status are significantly associated with the GCS measurement practice among ICU working nurses. Male nurses performed GCS assessments more than female nurses did, and MSc-holder nurses performed GCS assessments more than Bsc-holders (Table 3). When it came to GCS assessment practice, 60% of male nurses did so well, compared to 32.1% of female nurses. 81.8% of nurses with MScs and 43.6% of those with BSc perform GCS assessments correctly. Nursing professionals with less than or equal to five years of experience practiced GCS at a rate of 49%, compared to 40% for professionals with more than five years of experience.

Table 3. The comparison of nurses' GCS assessment practices with an independent variable working in AICUs of federally administered hospitals, Addis Ababa, Ethiopia, June 2020 (n=121)

Variable		N	%	GCS practice		P value*
				Poor N (%)	Good N (%)	
Sex	Male	65	53.7	26 (40)	39 (60)	0.002
	Female	56	46.3	38 (67.85)	18 (32.14)	
Educational status	BSc	110	90.9	62 (56.36)	48 (43.63)	0.016
	MSc	11	9.1	2 (18.18)	9 (81.81)	
Work experience	≤5years	96	79.33	49 (51.04)	47 (48.95)	0.424
	>5years	25	20.66	15 (60)	10 (40)	

* Pearson Chi-Square

Perceived barriers and factors to GCS assessment

The main problems that make it difficult for nurses to assess patients' GCS are a lack of ongoing training and updating (77.7%), work overload (73.6%), and insufficient knowledge and skills (61.2%).

Discussion

The Glasgow Coma Scale (GCS) is a scoring system that uses eye-opening, motor, and vocal responses to objectively quantify a person's state of consciousness and brain injury severity.

The current study indicated that participants with good GCS assessment practice in the adult intensive care unit are nearly half of the study participants.

Our findings are lower than those of a study conducted in India, which found that 83.6% of nurses had enough abilities (21), and inline a study conducted in Vietnam, which found that 47.9% of nurses correctly answered questions about clinical scenarios of GCS assessment application (22).

In contrast, the current study's findings are higher than those of a previous study conducted in Ghana, where only 5.2% had good expertise in practicing relevant clinical scenario questions (19). Disparities observed in this study could be attributed to differences in the tools, environment, and quality of training received by respondents. Other possible explanations for the disparity include variations in healthcare policy, the strength of the management system, and the availability of GCS assessment tools in health institutions.

Our current study identified several factors that could be determinants of GCS assessment practice in adult intensive care units. Sex and educational levels have been identified as factors that influence GCS assessment practice. Our findings are in line with research conducted in the African countries of Nigeria (4) and Egypt (13), which found that males have more GCS practice.

In contrast, a study conducted in Ghana, another African country, found that female nurses in clinical situations had higher levels of GCS assessment practice (19). The difference might be due to respondent experience, sampling, or other socio-demographic differences.

Similarly, educational status is a factor in the current study's GCS assessment practice among adult intensive care unit nurses. This conclusion is consistent with research conducted in Egypt (13). This implies that the more GCS knowledge the nurses' staff received, the more they practiced. In our findings, years of nurses' experience in ICU had no association with the application of GCS assessment practice. This discovery is in line with the findings of a Vietnamese investigation (22). The finding could be due to a variety of factors, including sample size, study location, availability of GCS assessment tools, and training variation.

The current study has the following limitations: we use only a self-administered clinical scenario questionnaire to assess practice. It was better if qualitative techniques and an observational checklist supported it. Because of the non-probability sampling techniques, the result may not be applied to the entire target population.

Conclusion

In this study (47.1%) of the participants showed the good practice of GCS assessment. This shows that most of the nurses in the intensive care units are not implemented GCS assessment practice. The findings of our study advise stakeholders to focus on training and presentation of GCS assessment tools, as well as close supervision and support of GCS assessment application by ICU personnel, nurses, and healthcare administrators. On their side, researchers conduct future research by overcoming current finding limitations.

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Conflict of interest

The authors declare that there is no competition of interest.

References

1. Jaddoua BA, Mohammed WK, Abbas AD. Assessment of nurse's knowledge concerning glasgow coma scale in neuro surgical wards. Kufa J Nurs Sci. 2013;3(2).
2. Al-Quraan H, AbuRuz ME. Assessment of Jordanian nurses' knowledge to perform Glasgow Coma Scale. European Scientific Journal. 2016 Sep 1;12(27).
3. Matis G, Birbilis T. The Glasgow Coma Scale–a brief review Past, present, future. Acta Neurol Belg. 2008 Sep 1;108(3):75-89.
4. Ehwarieme TA, Anarado AN. Nurses use of Glasgow coma scale in neurological assessment of patients in university of Benin Teaching Hospital, Benin City Edo State, Nigeria. Journal of Medicine and Biomedical Research. 2017;16(1):47-61.
5. Bhaskar S. Glasgow coma scale: technique and interpretation. Clinics in Surgery. 2017;2:1-4.
6. Ayoub A, Saifan A, Alamsouri E, Hussain H, Salim N. Assessment of nurses' knowledge about Glasgow coma scale at al Dhafra Hospitals, Abu Dhabi. Journal of Clinical Review & Case Reports. 2018;3(7):1-5.
7. Reith FC, Brennan PM, Maas AI, Teasdale GM. Lack of standardization in the use of the Glasgow Coma Scale: results of international surveys. Journal of Neurotrauma. 2016 Jan 1;33(1):89-94.
8. Iankova A. The glasgow coma scale clinical application in emergency departments. Emergency Nurse. 2006 Dec 1;14(8).
9. Albougami A. Exploring nurses' knowledge of the Glasgow Coma Scale (GCS) in intensive care and emergence departments at a tertiary hospital in Riyadh cty, Saudi Arabia. The Malaysian Journal of Nursing (MJN). 2019 Oct 1;11(2):23-30.
10. Jennett B. Development of Glasgow coma and outcome scales. Nepal Journal of Neuroscience. 2005 Jan 31;2(1):24-8.
11. AbuRuz ME. Simplifying Glasgow Coma Scale Use for Nurses. International Journal of Nursing Didactics. 2016 Jan 31;6(01):17-22.
12. Bledsoe BE, Casey MJ, Feldman J, Johnson L, Diel S, Forred W, Gorman C. Glasgow Coma Scale scoring is often inaccurate. Prehospital and Disaster Medicine. 2015 Feb;30(1):46-53.
13. Ahamed ST, Ebraheim MN. Glasgow Coma Scale technique: Effect of theoretical and practical educational program on nurses' compliance. Journal of Nursing and Health Science. 2017;6(3):21-8.
14. Oktarina Y, Simajuntak CA. Comparison of glasgow coma scale with full outline of unresponsiveness score in measuring consciousness level of endotracheal tube intubated patient in the intensive care unit. International Journal of Research in Medical Sciences. 2018 Jun;6(6):1882-5.
15. Laytin AD, Sultan M, Debebe F, Walelign Y, Fisseha G, Gebreyesus A. Critical care capacity in Addis Ababa, Ethiopia: A citywide survey of public hospitals. Journal of Critical Care. 2021 Jun 1;63:1-7.
16. Amare AT, Tesfaye TD, Ali AS, Woelile TA, Birlie TA, Kebede WM, Tassew SF, Chanie ES, Feleke DG. Survival status and predictors of mortality among traumatic brain injury patients in an Ethiopian hospital: A retrospective cohort study. African Journal of Emergency Medicine. 2021 Dec 1;11(4):396-403.
17. Tesfaye Ejigu. Addis Ababa's ailing state hospitals: Addis standard. October 2013 [cited 2020 Jan 5] Available from: https://addisstandard.com/addis-ababas-ailing-state-hospitals-2/
18. Bansal S, Chawla R. Awareness of Glasgow Coma Scale in anaesthesiology post-graduates in India: A survey. Journal of Neuroanaesthesiology and Critical Care. 2016 Dec;3(03):227-32.
19. Alhassan A, Fuseini A-G, Musah A. Knowledge of the Glasgow Coma Scale among nurses in a tertiary hospital in Ghana. Nursing

Research and Practice. 2019 Jun 24;2019:5829028. doi: 10.1155/2019/5829028.
20. Moosy S. Nurses knowledge on initial assessment and management for traumatic brain injury patients in regional referral hospital Dar es salaam, Tanzania: Muhimbili University of Health and Allied Sciences; 2020. (Doctoral dissertation).
21. Teles M, Bhupali P, Madhale M. Effectiveness of self instructional module on knowledge and skills regarding use of Glasgow coma scale in neurological assessment of patients among nurses working in critical care units of KLE Dr. Prabhakar Kore hospital and medical research centre, Belgaum. Journal of Krishna Institute of Medical Sciences University. 2013 Jan 1;2(1):98-104.
22. Nguyen TH. The accuracy of Glasgow coma scale knowledge and performance among Vietnamese nurses 2011. (Doctoral dissertation).