

Knowledge of the Glasgow Coma Scale among Physician Interns in a Nigerian Tertiary Health Facility

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Abstract

Background: The Glasgow coma scale (GCS) is the most utilized level of consciousness scale globally. Insufficient working knowledge of the GCS by physicians may contribute to poor outcomes in patients with altered levels of consciousness. **Aim:** This study aims to assess the knowledge of the GCS among the physician interns, also known as house officers, in a rural tertiary health facility in Nigeria. **Materials and Methods:** This was a questionnaire-based survey among physician interns in a rural tertiary hospital in Nigeria. **Results:** All the 77 respondents graduated from medical school within 2 years of the study. Seventy-two (93.5%) of the participants had been actively involved in the management of patients at the hospital's accident and emergency department within a month before the study, while 71.4% had been involved in emergency care outside the accident and emergency department within a month prior. Seventy-five (97.4%) conceded to having received didactic lectures on the GCS in the course of their medical training. About three-quarters (74.03%) of the respondents correctly defined GCS as GCS; about 85.7% were able to correctly identify all the clinical variables of the GCS, while only 15.6% could correctly describe and score all the parameters of the grading scale. The eye-opening response was the most correctly remembered (64.9%), followed by the verbal response (42.9%), while the motor response was remembered by 29.9% of the respondents ($P = 0.04$). Only 36 (46.8%) participants were aware of any subsequent modification to the original GCS score. **Conclusion:** The working knowledge of GCS is poor among physician interns surveyed in this study. The clinical variable of the GCS with the highest number of items, the motor response, was the least correctly remembered.

Keywords: Glasgow Coma Scale, knowledge, Nigeria, physician interns

INTRODUCTION

The Glasgow Coma Scale (GCS) is the most utilized level of consciousness grading scale globally.^[1-4] It was initially described in 1974 by Graham Teasdale and Bryan Jennett to assess levels of consciousness after head trauma, but subsequently, the GCS scoring has been deployed in a wide range of neurological (and even nonneurological) conditions that can cause perturbations in the level of consciousness in patients.^[1,5,6] The GCS holds its global acceptance in clinical practice to the fact that it is objective, simple, reproducible, reliable, and presumably easy to learn.^[3,4,7]

Despite its appeal and widespread application, some doubts exist concerning its adequacy, flexibility for varying clinical scenarios, interrater reliability, and, even, its simplicity.^[8-10] Insufficient working knowledge of the GCS by physician interns, usually the first physicians to attend to patients in many

clinical settings, may contribute to poor outcomes in patients with altered levels of consciousness. This is particularly so in hospitals located in rural practice areas, such as our own, as well as in those without neurology or neurosurgical services, a situation that is not uncommon in our country. In these settings, there may be significant time lags in recognition of deterioration in patients' levels of consciousness with consequent delay in commencement of resuscitative measures or referral to centers where specialist care is available.

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Only a few studies have interrogated the knowledge of the GCS among physicians in Nigeria, a large, 200 million people nation in sub-Saharan Africa.^[11-13] Sadly, the extant studies all demonstrated poor knowledge of this important tool, across all cadres of doctors, but suggested a better knowledge among the most junior cadre of doctors (the physician interns) presumably because they had the most recent exposure to formal teachings on GCS. No study, to the best of our knowledge, however, has interrogated the knowledge of GCS in the latter population alone, while there are only very few studies in Nigeria showing the level of knowledge of GCS among physician interns that are working in centers where there are no robust neurology and neurosurgical practices. This study, therefore, aims to assess the knowledge of the GCS among the physician interns/house officers in one of the “neurologically and neurosurgically less well developed” tertiary health facilities in Nigeria.

MATERIALS AND METHODS

Setting

Our hospital is a tertiary health facility located in a transitional rural–urban city in the Southwest region of Nigeria. It is the sole provider of federal government-subsidized tertiary health-care services in the host, Ondo State, and other rural–urban cities of the neighboring Ekiti, Edo, Kogi, and Osun states. Moreover, providing postgraduate medical training in many clinical specialties, the hospital employs mostly locally trained physician interns and a few foreign-trained ones (usually about 10 percent or less).

Data collection and analysis

This was a questionnaire-based survey using a convenience sampling of the physician interns. The questionnaires were administered during departmental meetings. Participation was voluntary and impromptu, and confidentiality was ensured. The respondents were required to complete the questionnaires on the spot without reference to any resource material. Information collected included the duration since graduation from medical school and the duration since the last emergency room and nonemergency room emergency work. They were asked to identify the definition of the abbreviation GCS, the title of each of the three variables, and the definition as well as scoring of the components of each variable. After a convenient sampling population was achieved, the data were entered into an electronic spreadsheet, and then analyzed with the IBM's statistical package for the social sciences (SPSS) version 20 (IBM, New York, USA). The details of the performance of the participants were presented in descriptive statistics, including frequencies and proportions, and in tabular form. Bivariate cross-tabulation for statistical associations between the clinical variables and their correct identification, as well as the length of the clinical variables and their correct definition and scoring, was done with the Chi-square test, whence an alpha value of < 0.05 was deemed statistically significant.

RESULTS

There were 77 respondents in this study, most (83.1%) of them in the third decade of life. All graduated from medical schools

within 2 years of the study. Most (93.5%) of the participants had been actively involved in the management of patients at the hospital's accident and emergency department within a month before the study, with more than half within a week, while 71.4% had been involved in emergency care outside the accident and emergency department within a month prior [Table 1]. Seventy-five (97.4%) conceded to having received didactic lectures on the GCS in the course of their medical training to date. Sixty (77.9%) believed that the GCS is a very important tool of clinical practice.

About three-quarters (74.03%) of the respondents correctly defined the GCS as GCS. Sixty-six (85.7%) were able to correctly identify all the clinical variables (eye opening, verbal response, and motor response) of the GCS [Table 2], while only 15.6% could correctly describe all the parameters of the scale [Table 3]. The eye-opening response was the most correctly remembered and scored (64.9%), followed by the verbal response (42.9%), while the motor response was remembered by 29.9% of the respondents, as shown in Table 3 ($P = 0.04$).

Only 46.8% of the study participants were aware of any subsequent modification to the original GCS score. Not one of them knew that the original GCS total score was actually 14, as against the extant score of 15.

Table 1: Duration since the last call in accident and emergency and involvement in emergency care outside of accident and emergency by the respondents

	<i>n</i> (%)
Duration since the last call in accident and emergency	
<One week	43 (55.84)
One-two weeks	9 (11.69)
>Two-four weeks	20 (25.98)
One-three months	5 (6.49)
Duration since the last emergency care outside of accident and emergency	
<One week	24 (31.17)
One-two weeks	22 (28.57)
>Two-four weeks	9 (11.69)
One-three months	19 (24.67)
>Three months	3 (3.90)

Table 2: Proportions of study participants with correct identification of the clinical variables used to assess the Glasgow Coma Scale

	Yes, <i>n</i> (%)	No, <i>n</i> (%)
BEO	70 (90.91)	7 (9.09)
BVR	72 (93.51)	5 (6.49)
BMR	67 (87.01)	10 (12.99)
All variables	66 (85.71)	11 (14.29)

$\chi^2=0.762$, $P=0.463$. BEO: Best eye opening, BVR: Best verbal response, BMR: Best motor response

Table 3: Proportions of the study participants with the correct definition of all respective components of each clinical variable of the Glasgow Coma Scale

	Yes, <i>n</i> (%)	No, <i>n</i> (%)
BEO	50 (64.94)	27 (35.06)
BVR	33 (42.86)	44 (57.14)
BMR	23 (29.87)	54 (70.13)
All variables	12 (15.58)	65 (84.42)

$\chi^2=5.649$, $P=0.04$. BEO: Best eye opening, BVR: Best verbal response, BMR: Best motor response

DISCUSSION

Despite the perceived inadequacies, raising concerns about the complexity of an apparently simple clinical grading scale, and efforts to correct the deficiencies of the GCS, it remains the most widely deployed scale for assessment of levels of consciousness in patients in clinical practice.^[1,14] Although there exist only a few studies on the understanding of the GCS grading among physicians in our country, all these previous studies showed an apparent poor working knowledge of this important clinical-practice tool across all specialties and cadres of physicians, albeit with an apparent trend toward better performance by more recent medical graduates (the interns).^[11-13]

All the respondents in this study were recent graduates from medical schools, in fact, within the preceding 2 years and were mostly in their third decade of life. Similar to the earlier studies by Adeleye *et al.*^[11] and Emejulu *et al.*,^[12] a significant proportion of our study participants had received didactic lectures on the GCS, agreed that the GCS is a very important clinical tool, and had recently been involved in emergency care of patients.

The percentage of our respondents who were able to correctly define GCS as GCS was similar to the 70.5% reported by Emejulu *et al.*,^[12] but lower than the rates reported by Adeleye *et al.*^[11] and Yusuf *et al.*^[13] More than four-fifth of our respondents were able to correctly identify the variables of the GCS, but their performance declined remarkably when asked to define and score the details of each variable, with only 15.6% being able to correctly define and score all components of the variables. This latter figure was lower than the 22%–54% from previous studies from our country and the 35% in the similar cadre of doctors in the report by Adeleye *et al.*^[11-13] Similar to the reports by Adeleye *et al.*,^[11] and Emejulu *et al.*,^[12] however, there was a statistically significant inverse relationship between the number of items in the variables and their recall by the respondents. The eye-opening response with its four items was the best remembered, while the six-point motor response was the least recalled [Table 3].

The working knowledge of the GCS among the doctors in the study is worse than previously reported in our country. We had presumed that with the increasing number of neurological and neurosurgical facilities/units in our nation's universities/

teaching hospitals, the newer generation of medical graduates would have a better understanding of this important neurological tool. The perceived relatively good performance among the interns in the earlier studies was, however, not corroborated by our findings. This may be due to the comparatively lower academic intensity of clinical practice in our center. Our health facility is not a training center for medical students, not being affiliated with any medical school, and does not have robust neurological and neurosurgical services as yet.

This study suffers from being a single-center study from a rural, relatively less academic setting and may not be a true reflection of the picture in other similar settings and, indeed, the more academically robust urban teaching hospitals in our country. Nevertheless, it gives an insight into the poor knowledge of GCS by physician interns. We hope our findings will also trigger a widespread study of the subject in our country.

CONCLUSION

The working knowledge of the GCS is poor among fresh medical graduates surveyed in this study that emanated from a frontline Nigerian rural tertiary health-care facility. Somewhat corroborating the findings of the few previous similar studies in other parts of our country, the clinical variable of the GCS with the highest number of parameters, the motor response, was the most bothersome to the participants in this study.

With the increasing number of medical schools and neuroscience centers in our country, a competency-based medical curriculum designed to produce medical graduates with better competence in basic clinical neuroscience practice tools, such as the GCS, will be desirable. We also recommend regular revision and application of the GCS by physician interns and other cadres of doctors whose patient population may include those with altered levels of consciousness. This ought to improve the knowledge and correct deployment of this important clinical tool in most hospital settings.

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Conflicts of interest

There are no conflicts of interest.

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