



Original article

Medical students knowledge of the application of the Glasgow Coma Scale in deaf Patients

Conhecimento dos estudantes de medicina sobre a aplicação da Escala de Coma de Glasgow em pacientes surdos

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Abstract

Objective: to evaluate the knowledge of medical students in Montes Claros – MG about the use of Glasgow Coma Scale in deaf patients. **Materials and Methods:** this is a cross-sectional cohort research, which was characterized by a quantitative approach. A virtual data survey was carried out with all academics who were attending the medical internship at a medical university in Montes Claros – MG. The data collection instrument was an electronic questionnaire, without a pilot project, prepared by the authors themselves and which included 08 multiple choice questions, the first 07 with 02 answer alternatives, while the last question with 04 alternatives. Data collection was carried out using Google Forms, while tabulation, analysis and interpretation of the collected data were carried out using Microsoft Excel 14.0 and Microsoft Word 14.0 software. **Results:** 55 students were interviewed, all of whom claimed to know GCS, with 92.7% (n=51) already using it on real patients. When asked whether they would have any difficulty applying it to deaf patients, 94.5% (n=52) said yes. However, only one participant had real experience using it on these patients. **Conclusion:** most students have difficulty determining the level of consciousness of deaf patients.

Keywords: Glasgow Coma Scale. Hearing Loss. Consciousness Disorders. Medical Students.

Resumo

Objetivo: avaliar o conhecimento dos acadêmicos do curso de medicina em Montes Claros – MG sobre o uso da Escala de Coma de Glasgow (ECG) em pacientes surdos. **Materiais e Métodos:** pesquisa de corte transversal caracterizada por uma abordagem quantitativa. Foi feito um levantamento virtual de dados com todos os acadêmicos que estavam cursando o internato de medicina em uma faculdade de medicina em Montes Claros – MG. O instrumento de coleta de dados foi um questionário eletrônico, sem projeto piloto, elaborado pelos próprios autores e que contemplou 08 questões de múltipla escolha, sendo as 07 primeiras com 02 alternativas de resposta, enquanto a última questão com 04 alternativas. A coleta dos dados foi feita em um Google Forms, ao passo que a tabulação, análise e interpretação dos dados coletados foram realizadas através dos softwares Microsoft Excel 14.0 e Microsoft Word 14.0. **Resultados:** entrevistaram-se 55 acadêmicos e todos afirmaram conhecer a ECG, sendo que 92,7% (n=51) já a utilizaram em pacientes reais. Quando questionados sobre se teriam alguma dificuldade em aplicá-la em pacientes surdos, 94,5% (n=52) afirmaram que sim. Todavia, somente um participante já teve a experiência real de usá-la nesses pacientes. **Conclusão:** os acadêmicos, em sua maioria, possuem dificuldades em determinar o nível de consciência de pacientes surdos.

Palavras-chave: Escala de Coma de Glasgow. Deficiência Auditiva. Nível de Consciência Alterado. Estudantes de Medicina.

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Introduction

The Glasgow Coma Scale (GCS) was developed and published in 1974 by Graham Teasdale and Bryan Jennett after international studies conducted in the early 1970s. The purpose of its creation was to provide a clinical index of acute impairment of "general" function of the brain, as well as to standardize and objectify the analysis of the depth and duration of impaired consciousness and coma in patients with some type of trauma or brain lesion¹⁻³.

Essentially, the GCS consists of three subscales that individually qualify the eye aperture (01 to 04 points), verbal response (01 to 05 points) and motor response (01 to 06 points). The result of this survey totals at least 03 and a maximum of 15 points, values of 08 or less, when found, correspond to severe conditions that require intubation^{2,4-6}.

Curiously, limitations inherent to the proposed model for the scale not only exist but also open gaps so that failures due to its application occur and that, with this, incorrect results can be generated. Since 1974, many scales have been proposed as alternatives to GCS^{2,7}.

Among the implications related to the Glasgow Coma Scale, perhaps the most common is the impossibility of evaluating the verbal response of patients with speech impairment (such as in the case of orotracheal intubation, tracheostomy or in patients who are deaf and not oralized)⁸. Koizumi *et al.*⁸ cite that different strategies have been adopted for the use of the GCS in these circumstances. In most cases, health professionals record the verbal response as "untestable", while others underestimate the value of this item by assigning it 01 point⁸. The reason for this is due to the fact that, in severe traumatic brain injury (TBI), it was demonstrated that the total score of the GCS, fixing the best verbal response at 01 point, which is close to the real^{2,7,8}.

As shown in chart 1, the items highlighted in red refer to those in which hearing and/or speech impairments may affect the patient's response during the examination. In the evaluation of the eyeaperture, the response to the verbal command, which corresponds to item 2, is impaired. In the evaluation of the verbal response, items 1 to 4 are compromised. Finally, in the evaluation of the motor response, items 1 and 2 are affected.

Moreover, some studies propose the use of simplified components of the GCS as an alternative to its total use, such as the Simplified Motor Score (SMS), which, even evaluating only motor reactions, proven to have great predictive value of serious brain injuries. Alternatively, another scale of great scientific prestige that can be used in the evaluation of TBI in patients with endotracheal tube, sensory disabilities or aphasia is the RLS-85 (Reaction Level Scale). In fact, it was designed to overcome the limitations of the GCS and, although used almost exclusively in Sweden, is considered reliable, reproducible and superior to the GCS^{9,10}.

**Chart 1.** Glasgow Coma Scale highlighting variables that are not viable for testing in deaf individuals.

Eye aperture	Spontaneous	4
	To sound	3
	To pressure	2
	Absent	1
	Not tested	NT
Verbal response	Oriented	5
	Confused	4
	Words	3
	Sounds	2
	Absent	1
	Not tested	NT
Best motor response	Follows commands	6
	Localizing	5
	Normal flexion	4
	Abnormal flexion	3
	Extension	2
	Absent	1
	Not tested	NT

Source: https://edisciplinas.usp.br/pluginfile.php/4503800/mod_resource/content/1/NOva%20Escala%20de%20Coma%20de%20Glasgow.pdf

Caption: NT: not testable.

In short, there is no approach or suggestion in the literature that has been unanimously adopted to evaluate the GCS score in patients unable to verbalization⁷. It is worth mentioning that, although not all individuals with total hearing loss (deaf) commonly present oral communication dysfunctions and, thus, also fall within this conjunct¹¹. That said, given such disparity, it is necessary to describe the frequency with which different methods are adopted to assess the level of awareness of deaf patients in our environment.

The main objective of this study was to evaluate the knowledge of medical academics in Montes Claros – MG about the use of GCS in deaf patients. In addition, as secondary objectives, it was sought to determine the knowledge of medical students about the existence of GCS adaptations and their use in patients, as well as describe the use of other scales for assessing the level of consciousness in this population group.

Materials and Methods

The present research consisted of a cross-sectional study that was characterized by a quantitative approach. The study population was made up of academics who were studying medicine in one of the medical schools of the city of Montes Claros-MG, which, in total, consists of about 280 students.

The inclusion criteria included medical students enrolled in the curricular activities of the last four periods (internship) of the course. Were excluded from the study students absent for health reasons, maternity leave and/or other reasons, those who, for any reason, did not receive the survey

questionnaire, as well as those who have opted out of voluntary participation at any stage of data collection.

Aiming at practicality and objectivity, the data collection was done by applying an electronic questionnaire formatted in the Google search management application: Google Forms. The questionnaire developed by the authors themselves consisted of eight questions, all of which were multiple choice. It was evaluated the knowledge that medical interns in Montes Claros - MG had about the application of GCS in deaf patients. The first seven questions of this questionnaire contained each one of them, two alternative answers, while the last question presented four alternatives.

After approval of the Research Ethics Committee (REC), the dates for applying the questionnaire with the class leaders of medical academics were scheduled in 2022. Then, the announcement was made to all participants via phone, email or social networks, inviting them to participate in the study. After that, the link containing the FICF and the survey questionnaire was sent to participants who met the inclusion criteria.

It is noteworthy that the electronic form of the survey was self-explanatory and guided the participant to read and sign the FICF, as well as to read and answer the questions contained in the survey questionnaire. After completion of the survey, the responses were tabulated and analyzed by means of absolute and relative frequency calculations. For this, the software Microsoft Excel (version 14.0) was used.

The present research was carried out according to ethical criteria¹² by the Research Ethics Committee and approved with an opinion of n. 2,428,669.

Results

All participants stated they knew the GCS, and 92.7% (n=51) have already applied it in patients and only one applied the GCS in deaf patients. Fifty-five medical scholars participated in the study, representing about one fifth of the total number of students enrolled in the last four periods of the course. All of them stated to know the Glasgow Coma Scale (GCS), and 92.7% (n=51) reported having already applied the scale in patients. However, only one participant mentioned having used GCS in deaf patients.

When asked about the difficulty of applying GCS in deaf patients, 94.5% (n=52) said they would face difficulties. However, 36.4% (n=20) stated that they did not know the limitations of GCS described in the scientific literature, while 63.6% (n=35) said they knew about these deficiencies. Although most of the participants were aware of these limitations, 70.9% (n=39) indicated that they did not know about GCS adaptations or other scales created to overcome such limitations.



In addition, 98.2% (n=54) of the participants never used GCS adaptations or other scales to evaluate the level of awareness of deaf patients. When asked about which scale they would use to assess the level of consciousness of a deaf patient, 90.9% (n=50) replied that they did not know. Only 5.5% (N=3) chose the Simplified Motor Scale, 1.8% (n=1) selected the Reaction Level Scale, and 1.8% (N=1) opted for another scale. All detailed results can be found in Table 1.

Table 1. Results of the application of the assessment of medical students' knowledge about the application of the Glasgow Coma Scale in deaf patients.

Question	Yes	No		
1.Do you agree with the informed consent form?	55	0		
5.Do you know the Glasgow Coma Scale?	55	0		
6.Have you ever applied the Glasgow Coma Scale to real patients?	51	4		
7.Have you ever used the Glasgow Coma Scale to assess the level of consciousness of a deaf patient?	1	54		
8.Considering that some deaf people cannot speak, have you had (or would you have) any difficulty applying the Glasgow Coma Scale to deaf patients?	52	3		
9.Did you know that the Glasgow Coma Scale has some limitations described in the scientific literature?	35	20		
10.Did you know that there are adaptations of the Glasgow Coma Scale, as well as other scales for assessing the level of consciousness that were created to overcome its limitations?	16	39		
11.Have you ever used an adaptation of the Glasgow Coma Scale or any other scale for assessing the level of consciousness to examine a deaf patient?	1	54		
2.What undergraduate degree are you currently pursuing?	Medicine (n=55)	Other undergraduate course (n=0)		
3.What period of the medical course are you currently in?	Basic or clinical cycle (n=0)	Internship (n=55)		
4.At which institution do you study medicine?	Institution 1 (n=55)	Institution 2 (n=0)		
12.If your answer to question 11 was yes, which other scale did you use? If not, if you had to use one of these other scales to assess the level of consciousness of a deaf patient, which one would you use?	Don't know (n=50)	Reaction Motor Scale (RLS85) (n=0)	Simplified Motor Scale (SMS) (n=3)	Others cale (n=1)

Discussion

In this study, it was demonstrated that the minority of participants had contact with deaf patients. This reflects the lack of ability to deal with this type of obstruction when it is necessary to assess the level of awareness in these patients, as demonstrated when most report difficulties applying GCS to deaf people.

Corroborating with the lack of knowledge and practice of health professionals on this particular subject, a study conducted at the Hospital das Clínicas Complex of the Faculty of Medicine of the University of São Paulo (HCFMUSP) it is exposed that, one of the parameters evaluated in GCS is the verbal response⁸.

In the literature review carried out by researchers from Aracaju, SE, Brazil, it is evident that the GCS remains as the gold standard for the evaluation of the level of consciousness, being used worldwide by several emergency services. However, even though there are other scales, such as SMS and RLS 85 that can contemplate the limitations present in the EKGs regarding verbal response in non-oralized or aphasic deaf patients, they are not used daily by emergency professionals¹⁰. Thus, the majority of medical scholars in this study, upon graduation, have this deficit to correctly assess the level of awareness of deaf patients. This is notable because, although more than half of the participants reported having knowledge about the limitations of GCS, only a minority does not know such limitations, most of these academics do not know the other proposed scales and therefore will not apply in your medical routine.

In view of this, it was noticeable that the majority of the medical interns have no knowledge about the other scales to evaluate the level of awareness before a patient with hearing loss, claims to have never used GCS or other scales adaptations to examine a deaf patient and reports not knowing which scale to choose when facing these patients.

Among the main limitations of the research is the possibility that the academic interviewed has read about the subject during the process of filling out the answers in Google Forms. Another point to be commented is that only a fraction of the academics participated in the research, so that the sample may not have reflected the real knowledge of the academics on the subject.

Conclusion

Most of the students in the internship evaluated have difficulties to assertively obtain the level of consciousness of a deaf patient. This may be associated with the lack of contact with such patients during graduation, as well as not witnessing medical conduct in such situations. Based on the verification of these students' knowledge about the evaluation of the level of consciousness in deaf patients, the data obtained were consistent with those identified in the literature.

Authors' Contribution

Samuel Gustavo Rodrigues Reis: Conception and design of the research; data collection; data analysis and interpretation; manuscript writing. **Samuel Gustavo Rodrigues Reis and Marcelo José da Silva de Magalhães** Critical review of the manuscript regarding the intellectual content and final presentation. The

authors approved the final version of the manuscript and declared themselves responsible for all aspects of the work, including ensuring its accuracy and integrity.

Conflict of interest

The authors declare no conflicts of interest.

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