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Clinical knowledge of epilepsy: A comparative evaluation of final year undergraduate students of health sciences

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ABSTRACT

Background: Inadequate knowledge of epilepsy among healthcare providers is believed to have far reaching impact on the quality of care provided to people living with epilepsy. The Objective was to comparatively evaluate the clinical knowledge of epilepsy among final year undergraduate students of health sciences.

Methods: It was a cross sectional study conducted among final year undergraduate students in the Colleges of Pharmacy, Medicine and Nursing Sciences of Gregory University, Uturu, Abia State, Nigeria. The instrument used in obtaining data was a 39 item questionnaire developed for the study. The mean of the total epilepsy knowledge score was determined and used to compare the clinical knowledge of epilepsy among the participants. Data obtained from the study was analyzed using the IBM SPSS for windows version 27.0. The inferential statistical tool, ANOVA, was also used to make comparisons. A prior level of significance $P<0.05$ was used for all comparisons.

Results: A total of 121 students participated in this study. Majority of the study participants (60.3%; n = 73) had an average clinical knowledge of epilepsy. There was a statistically significant difference in the mean epilepsy knowledge score among the students in the three healthcare disciplines (Medicine = 23.55 ±4.56; Pharmacy = 22.75 ±3.80; Nursing science = 20.72 ±4.46; $F = 5.201$; $p < 0.01$).

Conclusion: Majority of the participants demonstrated an average clinical knowledge of epilepsy. Medical students exhibited a significantly higher clinical knowledge of epilepsy compared to their counterparts in pharmacy and nursing science. There's need for a more integrated approach to epilepsy education.

Introduction

Epilepsy is reported to be one of the most prevalent neurological disorders worldwide, imposing a significant burden on individuals, families, and healthcare systems due to its chronic nature and associated comorbidities. Narrowing the treatment gap and reducing epilepsy-associated stigma has been identified as effective measures to reduce the global burden of epilepsy [1–4].

Studies have shown poor knowledge of epilepsy among medical students and practicing physicians [5-7]. Knowledge of epilepsy among other categories of healthcare providers, including nurses, has also been reported to be poor [8,9]. A study in Burkina Faso, among nurses and midwives found that almost a third of the participants believed that epilepsy is a contagious disease, while a similar study among nurses in Palestine reported that almost all the participants believed that epilepsy is a contagious disease [10,11]. Another study among pharmacists also reported poor knowledge of epilepsy among this category of healthcare providers [12].

Inadequate knowledge of epilepsy among healthcare providers is believed to have far reaching impact on the quality of care provided to people living with epilepsy. For instance, limited understanding of the clinical presentation and diagnostic criteria may result in misdiagnosis and

delayed treatment, which in turn may cause an increase in the risk of complications. Furthermore, poor clinical management of the condition due to insufficient knowledge may occur thus limiting the comprehensive care and support that should be provided to individuals with epilepsy [13,14].

Currently, there appears to be limited empirical evidence evaluating and comparing the level of clinical knowledge related to epilepsy across various undergraduate health science disciplines such as medicine, pharmacy, nursing, and allied health programs. Differences in curriculum content, teaching methodologies, and clinical exposure may contribute to varying degrees of understanding among students from different programs. Without a clear understanding of these disparities, educational institutions may struggle to identify specific knowledge gaps or misconceptions that could hinder effective epilepsy management in clinical practice. Therefore, this study was conducted to comparatively evaluate clinical knowledge regarding epilepsy among undergraduate health sciences students. By systematically assessing their knowledge, the study aimed to identify deficiencies, erroneous beliefs, and areas that require targeted educational interventions, thereby contributing to the enhancement of epilepsy education and ultimately improving patient care outcomes.

Methods

Study design

It was a cross-sectional study aimed at carrying out a comparative evaluation of the knowledge of epilepsy and its management among undergraduate students of health sciences.

Study population

The study was conducted among final year undergraduate students in the Colleges of Pharmacy, Medicine and Nursing Sciences of Gregory University, Uturu, Abia State, Nigeria.

Gregory University Uturu (GUU) is a privately owned university licensed in 2012 by the Nigerian Government and offers a wide variety of bachelor's degrees and professional programs across several colleges including health sciences.

Participants' eligibility criteria/sample size determination

All final year students at the Colleges of Pharmacy, Medicine and Nursing Sciences of the University, during the 2024/2025 academic session, who provided a written informed consent to participate in the study were eligible for recruitment.

Students who were not present at the University during the period of data collection were not part of the study. In a bid to ensure sufficient statistical power, particularly considering the relatively small population size, all the students who met the eligibility criteria were recruited into the study.

Data Collection Instrument – Development and test of reliability

The instrument used in obtaining data for our study was a 39-item questionnaire developed for this study after review of relevant literature [1,5,7,8, 10–12,14–17]. In addition, five questions capturing the demographic details of the respondents were attached to the questionnaire. The developed questionnaire was reviewed by a team of expert panel comprising of clinicians practicing in the academia, hospital and community; who assessed the instrument's layout, general appearance, readability, clarity of wording and suitability to measure clinical knowledge of epilepsy among the target respondents. This was aimed at confirming content validity. These experts reviewed the questionnaire individually and rated it based on four categories: content relevance, clarity, simplicity and ambiguity [18]. All the comments from the content and face validation process were thoroughly discussed by the research team. The items were then either edited, removed or remained unchanged. A pilot test was carried out on the revised data collection instrument among 18 non-final year students (6 students from each participating college) who were not part of the final study. This was carried out to assess the readability and general formatting of the instrument. A reliability test (using Cronbach's alpha on the IBM statistical programme and service solutions software) was then carried out to assess the constancy of the instrument in producing the same result in repeated measurements.

Scoring and grading of participants' responses

Correct responses to each epilepsy knowledge question in the questionnaire attracted a score of 1 point. The highest possible score was 39 points. The mean of the total score was determined and used to compare the clinical knowledge of epilepsy among the participants. Furthermore, the total knowledge score for the respondents was graded into poor, average and high. Students considered as having poor knowledge had a total score <20 points, those with average knowledge had scores between 20 - < 28 points, while students with 28 points and above were considered as having a high clinical knowledge of epilepsy.

Data analysis

Data obtained from the study was analyzed using the IBM statistical programme and service solutions (SPSS) for windows version 27.0. Descriptive statistics were used to summarize data. The inferential statistical tool, ANOVA, was also used to make comparisons. A prior level of significance $P<0.05$ was used for all comparisons.

Ethical Consideration

Ethical clearance for this study was obtained from the Akwa Ibom State Ministry of Health based on the recommendation of the State Health Research Ethics Committee (Ref: MH/PRS/99/VOL.V/570). Furthermore, written informed consent was obtained from all the participants in this study. Participants were assured that all the data obtained would be kept confidential.

RESULTS

Reliability and internal consistency of the data collection instrument

The overall Cronbach's alpha of the questionnaire used in assessing participant's clinical knowledge of epilepsy was 0.730.

Demographic characteristics of respondents

A total of 121 students participated in this study. Fifty-one (51) of the respondents were students in the College of Medicine, while 46 and 24 of the respondents were students in the College of Nursing Science and the College of Pharmacy respectively.

Majority (52.1%; n = 63) of the respondents were female, while 58 (47.9%) were male. Most of the study participants (57.9%; n = 70) were within the age range 20 – 24 years; while 46 (38.0%) and 5 (4.1%) were within the age range of 25 – 29 years and 30 – 34 years respectively.

Clinical knowledge of Epilepsy among the respondents

The results of the item-by-item analysis of the study participants' response to the evaluation questions are presented in Table 1.

Table 1: Epilepsy knowledge score among the respondents and test of difference

Sn.	Questions	Respondent's epilepsy Knowledge Scores/College				F	p-value
		Pharmacy	Medicine	Nursing	Total		
1.	Epilepsy is a chronic brain disease that cannot be cured or controlled.	0.750 (±0.442)	0.667 (±0.476)	0.457 (±0.504)	0.603 (±0.401)	3.708	0.027
2.	Epilepsy is the most common chronic neurological disorder in the world.	0.708 (±0.464)	0.647 (±0.483)	0.652 (±0.476)	0.661 (±0.475)	0.147	0.664
3.	Epilepsy can affect people irrespective of their race or socioeconomic conditions.	0.875 (±0.338)	0.980 (±0.140)	0.739 (±0.444)	0.868 (±0.340)	6.665	0.002
4.	Everyone with epilepsy present with the same symptoms.	0.458 (±0.509)	0.628 (±0.488)	0.91 (±0.493)	0.504 (±0.502)	2.888	0.060
5.	Epilepsy seizure occurs when there is a sudden excessive electrical discharge that disrupts the normal activity of the nerve cells.	0.792 (±0.415)	0.941 (±0.238)	0.848 (±0.363)	0.876 (±0.331)	1.966	0.145
6.	Given the appropriate circumstances, anybody can have a seizure.	0.458 (±0.509)	0.726 (±0.451)	0.609 (±0.493)	0.628 (±0.485)	2.599	0.079
7.	All seizures destroy nerve cells in the brain.	0.333 (±0.482)	0.509 (±0.505)	0.457 (±0.504)	0.455 (±0.500)	1.017	0.365
8.	Epileptic seizures always result in the loss of consciousness.	0.250 (±0.442)	0.569 (±0.500)	0.304 (±0.465)	0.405 (±0.493)	5.312	0.006
9.	Epilepsy is a psychiatric disease.	0.542 (±0.509)	0.549 (±0.503)	0.435 (±0.501)	0.504 (±0.502)	0.706	0.495

10.	Epilepsy is a contagious disease.	0.708 (±0.464)	0.922 (±0.272)	0.435 (±0.501)	0.694 (±0.463)	16.967	0.0001
11.	Epilepsy can be caused by a brain tumour.	0.333 (±0.482)	0.529 (±0.504)	0.500 (±0.506)	0.479 (±0.502)	1.317	0.270
12.	Epilepsy can be caused by alcohol or drug abuse.	0.417 (±0.504)	0.667 (±0.476)	0.652 (±0.482)	0.612 (±0.489)	2.442	0.091
13.	Epilepsy can be caused by a stroke.	0.917 (±0.282)	0.529 (±0.504)	0.674 (±0.474)	0.661 (±0.475)	5.887	0.004
14.	Epilepsy can have a genetic cause.	0.750 (±0.442)	0.863 (±0.348)	0.696 (±0.465)	0.777 (±0.418)	2.028	0.136
15.	Lack of sleep is a common trigger for epileptic seizures.	0.7500 (±0.442)	0.431 (±0.500)	0.696 (±0.465)	0.595 (±0.493)	5.312	0.006
16.	Low blood glucose levels may trigger an epileptic seizure.	0.833 (±0.381)	0.765 (±0.428)	0.739 (±0.444)	0.769 (±0.23)	0.390	0.678
17.	Epileptic seizures may be triggered by certain illness or fever.	0.875 (±0.338)	0.845 (±0.367)	0.761 (±0.431)	0.818 (±0.387)	0.866	0.423
18.	A generalized seizure is characterized by the involvement of the whole brain.	0.708 (±0.464)	0.686 (±0.469)	0.717 (±0.455)	0.703 (±0.459)	0.057	0.945
19.	Absence seizures are partial seizures.	0.292 (±0.464)	0.118 (±0.325)	0.152 (±0.363)	0.165 (±0.373)	1.848	0.162
20.	Tonic-clonic seizures are generalized seizures.	0.708 (±0.464)	0.824 (±0.385)	0.652 (±0.482)	0.736 (±0.443)	1.895	0.155
21.	In status epilepticus, seizures are prolonged or occur one after another without full recovery between seizures.	0.792 (±0.415)	0.843 (±0.367)	0.717 (±0.455)	0.785 (±0.412)	1.130	0.326
22.	Accurate diagnosis and effective management of epilepsy is carried out by a trained psychiatrist	0.458 (±0.509)	0.667 (±0.476)	0.413 (±0.498)	0.529 (±0.501)	3.536	0.032
23.	Diagnostic tests for epilepsy usually include an Electroencephalogram (EEG).	0.833 (±0.381)	0.863 (±0.348)	0.761 (±0.431)	0.818 (±0.387)	0.858	0.427
24.	Surgery is the primary treatment for epilepsy.	0.667 (±0.482)	0.784 (±0.415)	0.435 (±0.501)	0.628 (±0.485)	7.004	0.001
25.	Most cases of epileptic seizures can be controlled with medications called antiepileptic drugs.	0.875 (±0.338)	0.961 (±0.196)	0.674 (±0.474)	0.835 (±0.373)	8.209	0.0001
26.	If epileptic seizures are controlled for some months, the patient can reduce the dose of his/her antiepileptic drugs.	0.375 (±0.495)	0.235 (±0.428)	0.348 (±0.482)	0.306 (±0.463)	1.051	0.353
27.	If a patient expects a seizure, he/she should take an additional dose of his/her antiepileptic drugs.	0.333 (±0.482)	0.392 (±0.493)	0.283 (±0.455)	0.339 (±0.475)	0.641	0.529
28.	The sudden discontinuation of antiepileptic drug treatment can result in serious health complications.	0.750 (±0.442)	0.784 (±0.415)	0.869 (±0.340)	0.809 (±0.394)	0.911	0.405
29.	Dietary measures can be employed in the treatment of epilepsy.	0.792 (±0.415)	0.471 (±0.504)	0.717 (±0.455)	0.628 (±0.485)	5.163	0.007

30.	People with epilepsy are as capable as other people without the condition.	0.833 (±0.381)	0.780 (±0.418)	0.696 (±0.465)	0.758 (±0.429)	0.916	0.403
31.	People with epilepsy should avoid strenuous work because this can provoke seizure.	0.083 (±0.282)	0.157 (±0.367)	0.283 (±0.455)	0.190 (±0.394)	2.384	0.097
32.	Women with epilepsy are unable to have healthy babies.	0.667 (±00.482)	0.863 (±0.348)	0.422 (±0.499)	0.658 (±0.476)	12.148	0.0001
33.	People with epilepsy can participate actively in sports or other recreational activities.	0.833 (±0.381)	0.628 (±0.488)	0.587 (±0.498)	0.653 (±0.478)	2.226	0.108
34.	People with seizure should not swim without an accompanying person.	0.667 (±0.482)	0.686 (±0.469)	0.630 (±0.488)	0.661 (±0.475)	0.167	0.847
35.	Flashing or strobing lights (e.g., disco light, TV or computer screens) should be avoided by everyone with epilepsy.	0.500 (±0.511)	0.177 (±0.385)	0.261 (±0.444)	0.273 (±0.447)	4.551	0.012
36.	Patients with epilepsy should always disclose their condition to potential employers while applying for the job.	0.125 (±0.338)	0.059 (±0.238)	0.283 (±0.455)	0.157 (±0.365)	4.959	0.009
37.	All epilepsy patients who intend to drive, must alert the driving authorities about their condition.	0.208 (±0.415)	0.098 (±0.300)	0.217 (±0.417)	0.165 (±0.373)	1.448	0.239
38.	People with epilepsy should be cured before being allowed into public places such as religious gatherings, schools and markets	0.583 (±0.504)	0.765 (±0.428)	0.522 (±0.505)	0.636 (±0.483)	3.369	0.038
39.	All students with epilepsy should be taught in a special classroom specific for people with this condition	0.583 (±0.504)	0.804 (±0.401)	0.457 (±0.504)	0.628 (±0.485)	6.951	0.001
Mean total epilepsy knowledge score		22.750 (±3.802)	23.549 (±4.558)	20.717 (±4.456)	22.314 (±4.531)	5.201	0.007

Epilepsy Knowledge grade and test of relationship with demographic characteristics of the study population

Majority of the study participants (60.3%; n = 73) had an average clinical knowledge of epilepsy, while 30 (24.8%) and 18 (14.9%) had poor and high knowledge respectively. We found a significant relationship between respondents' knowledge grade and their age and College (Table 2).

Table 2: Relationship between sociodemographic variables and epilepsy knowledge grade

Variable	Knowledge grade			χ^2	p-value
	Poor (0 - <20)	Average (20 - <28)	High (28 – 39)		
Gender					
Male (n = 58)	14	34	10	0.492	0.782
Female (n = 63)	16	39	8		
Age range (in years)					
20 – 24	19	42	9	11.150	0.025
25 – 29	7	30	9		
30 – 34	4	1	0		
College					
Pharmacy	3	19	2	12.133	0.016
Medicine	11	27	13		
Nursing science	16	27	3		

Discussion

We comparatively assessed knowledge of epilepsy among final year students of medicine, nursing science and pharmacy. Our results revealed an average clinical knowledge of epilepsy among the students. Students in the college of medicine demonstrated better clinical knowledge of the condition than students in the colleges of pharmacy and nursing sciences. The observed difference was statistically significant. This may be due to differences in the level of clinical exposure to neurological diseases among students in the three professional disciplines. A previous study by Chomba *et al* [1] among non-physician healthcare workers identified significant gaps in epilepsy care knowledge, both in diagnosis and treatment. They opined that nurses and other clinical officers require more epilepsy care education than they are presently receiving [1].

We found that majority of the students across the three colleges demonstrated good understanding of the basic pathophysiology and triggers of epilepsy, with majority correctly identifying epilepsy as a chronic but controllable neurological disorder, recognizing that it affects people irrespective of race or socioeconomic status, and understanding that seizures are caused by abnormal electrical discharges in the brain. Our finding is consistent with an earlier report from a Nigerian study, which similarly observed moderate to high levels of epilepsy awareness among medical students [19]. Conversely, a survey of nurses and midwives working in primary health care settings in Ouagadougou of Burkina Faso found that only about a third of the population studied were aware of seizure triggering factors such as fever, alcohol consumption and sensory stimulation [10].

We identified gaps in the clinical knowledge of epilepsy among the respondents. For instance, many of the students erroneously asserted that everyone with epilepsy presents with the same symptoms and that all seizures destroy nerve cells in the brain. Clinical presentation of epilepsy is dependent on the type of epileptic seizure as some patients with the condition may either have retained or impaired awareness during a seizure episode, and not all seizures affect the integrity of the brain cells.

Most of the students opined that patients with epilepsy could discretionally discontinue their antiepileptic drugs, without the recommendation of their physician, when they attain seizure control for some months. Such discontinuations pose significant risks to the patient as there is evidence of increased risk of reoccurrence of seizures following the withdrawal of antiepileptic medicines [20]. The decision to discontinue antiepileptic medication should only be done based on the recommendation and supervision of a neurologist and such discontinuation should be done slowly, over a few months, but extended with drugs like the benzodiazepines and barbiturates [20].

We noted certain misconceptions among the students regarding the psychiatric and contagious nature of the condition, with many of them suggesting that people living with epilepsy should be cured before being granted access to public social or educational settings. These misconceptions indicate the persistence of stigma-related beliefs even among future healthcare professionals, a finding consistent with studies conducted among students and health workers in Nigeria and other developing countries [19,21]. A survey among Zambian healthcare workers reported that more than half of the respondents classified epilepsy as a form of mental illness [1]. Such misconceptions may be influenced by a combination of cultural beliefs, inadequate exposure to patients with epilepsy, and limited training on psychosocial aspects of neurological disorders.

We observed significant differences in certain areas of epilepsy knowledge across the disciplines studied. For instance, students of nursing science showed a lower level of knowledge of the therapeutic management and social aspect of epilepsy care. This is suggestive of a need for an improved curriculum that emphasizes clinical management of epilepsy in nursing education.

Adamolekun *et al* observed that a basic workshop-based training program was effective in improving the provision of epilepsy care by non-physician healthcare providers in Zimbabwe [22].

The findings of this study have highlighted the differences and similarities in epilepsy knowledge among final year undergraduate students in essential health science programs. This demonstrates the need for a more integrated approach to epilepsy education to ensure that all healthcare providers, regardless of the area of specialty, share a foundational knowledge of the condition. This is essential in multidisciplinary healthcare settings where coordinated care is necessary for optimal management of epilepsy patients.

Strengthening clinical knowledge about epilepsy among graduating students of health sciences would enhance healthcare delivery to people living with the condition. Chomba *et al* in their study in Zambia noted that more recent graduates of healthcare disciplines had higher knowledge of epilepsy care than older colleagues [1]. Their observation was attributable to recent curricular changes in the training of healthcare providers in the country [1].

Healthcare professionals with sufficient training in epilepsy are more likely to provide accurate diagnoses, recommend appropriate treatment regimens, and engage in effective

patient education and counseling. This would in turn lead to improved patient outcomes including reduced seizure frequency and an improved health related quality of life. Furthermore, increased knowledge among healthcare providers would reduce stigma and misconceptions regarding the condition within healthcare settings and the society at large. The incorporation of educational programs involving didactic and bedside training in epilepsy care into prequalification and continuing medical educational programs for healthcare professionals has been recommended [1].

Conclusion

Majority of the participants demonstrated an average clinical knowledge of epilepsy, however, significant gaps in knowledge and certain misconceptions regarding epilepsy exist among the students. Medical students exhibited a significantly higher clinical knowledge of epilepsy compared to their counterparts in pharmacy and nursing science, suggesting a difference in curricular content and clinical exposure. Our findings highlight the need for a more integrated, experiential, and stigma-sensitive training approaches in the education of future healthcare professionals.

Limitations of the study

The findings of this study are limited in generalizability because respondents were recruited from one tertiary institution. Furthermore, there may be a risk of selection bias in the sampling as students who were willing to participate in the study may differ in knowledge from those who choose not to participate in the study. Nevertheless, our findings provide valuable insights and have identified significant knowledge gaps and the presence of erroneous beliefs regarding epilepsy among graduating students in colleges of health sciences, highlighting the need for stigma-sensitive training approaches in the education of future healthcare professionals.

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Declarations

Author contributions

UIE conceived and designed the study. UIE, ILJ and DVV were involved in the development of the data collection instrument. UIE and AAE participated in data collection, analysis and interpretation. UIE wrote the manuscript and critically reviewed it for important intellectual content. All the authors read and approved the submitted manuscript.

Competing interest

The authors declare no competing interest.

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