Neurophobia: Fear of neurology during medical clerkship in three Nigerian medical schools

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ABSTRACT
Aim: To ascertain the perception of Nigerian medical students of neurology in comparison with 7 other major medical specialties. We sought to known whether neurology was the speciality students consider most difficult and the reasons for this and to appraise their opinion on how neurosciences subjects and neurology were taught.

Method: Self-administered questionnaires was used to obtain information from randomly selected clinical students from 3 medical colleges in Nigeria (Univeristy college Hospital, Ibadan; Univeristy of Ilorin, Ilorin; LAUTECH University, Osogbo).

Results: Of 320 questionnaires sent out, 302 were returned given 94% response rate. Students’ felt they knew neurology least of all the 8 medical specialties, and were not confident of making neurological diagnosis. About 82% of students indicated they learnt neurology best from bedside teaching, followed by use of medical textbooks. Close to 15% found online resources very useful for learning neurology and 6% indicated to have learnt from group discussion. Histology and biochemistry were the preclinical subjects participants opined were least useful for learning neurology. The most frequent reasons why they felt neurology was difficult were: problems with understanding neuroanatomy (49%), insufficient exposure to neurologcial cases (41%), too many complex diagnoses (32%) and inadequate neurology teachers (32%).

Conclusion: Nigerian medical students perceived Neurology as the most difficult medical specialty and are not interested in specializing in it. Neurology education would be improved upon by provision of more bedside tutorials and increased availability of online facilitates to enhance learning. There is need to emphasize more of small group discussions so that students will be used to team work after graduation.

Key words: Neurology, fear, medical students, teaching

Background
The term “neurophobia” was originally coined by Jozefowicz to describe the fearful perception of neurology and neurological sciences by medical students [1]. However, the phenomenon has been a long standing problem. Reported signs of neurophobia vary from confusion to display of intimidation, boredom and impatient desire for the class to end. Students with neurophobia during clinical
posting are eager for the posting to come to end [1]. Fear of neurology and avoidance of neurologic examination is very common amongst general practitioners (GP) [2,3]. In the survey of Thapar et al, GP rated themselves low in confidence and in caring for neurological disorders [2]. Patients have also corroborated the view that non-specialist doctors’ show lack of confidence and are unwillingness to manage neurological diseases [4].

Recently, there has been change in epidemiological pattern of diseases in most countries and neurological disorders are at the centre of this transition [5-7]. The number of acute and chronic neurological diseases seen in most out-and in-patient services are on the increase [8-10]. For example more cases of strokes, dementias and neurodegenerative disease have been reported [6,8]. This is probably a result of change in lifestyle in most communities towards western. So that the World Health Organization (WHO) had declared disorders of the neurological system a major public health problem [9] in view of the contribution of neurological diseases to global burden of diseases. Majority of these neurological disorder are often first seen by the GPs before referral to the specialist [10,11]. It is therefore pertinent that GPs, especially those practicing in developing countries with limited facilities brace themselves for the challenges of managing patients with neurological disorders before referral. Reasons that have been adduced as to why students and doctors alike are neurophobic include; shortness of neurologic education, unfocused education and training, and the separation of basic neurosciences and clinical studies at medical schools [1,4,12]. This study therefore, set out to ascertain the views of medical students in three Nigerian universities of neurology in comparison with seven other major medical specialties. The study also sought to answer whether perception of neurology as a difficult subject pose a serious challenge for students and non-neurologists when they try to learn and practice the subject and their choice of specialization.

Methods
A self-administered questionnaire was designed based on previous studies [4,13]. The study participants were medical students in three Nigerian universities. A medical school was chosen from the first generation (University of Ibadan), second generation (University of Ilorin) and third generation (Ladoke Akintola University of Technology) universities in Nigeria. The questionnaires were distributed to clinical students in 4th, 5th and 6th year of training. The questionnaire contains 10 questions which were divided in to 2 sections: firstly, to determine depth of knowledge and secondly, to know why neurology is considered difficult. Responses were graded on a maximum scale of 3 or 5, depending on the structure of the question (1 was the lowest possible score and 3 or 5 the highest). For example responses to questions on the usefulness of preclinical subjects to clinical clerkship and why neurology was considered to be difficult had a maximum score of 3 (not a contributor-1, a minor reason-2, major reason-3). The responses to questions on how knowledgeable participants were of various medical specialties had maximum rating of 5 (very difficult-1; moderately difficult-2; mildly difficult-3; easy-4; very easy-5). Data was analyzed with the Statistical Package for the Social Sciences version 11 (SPSS Inc). Frequency tables were generated for the variables. Means and standard deviations were determined. Mean scores of responses were calculated and student t-test was used to analyze the differences in mean values of responses. P value less than 0.05 was considered statistically significant.

Results
Out of 320 questionnaires sent out, 302 were returned giving a response rate of 94%. One hundred and eighty-one participants (59%) were males and 121 (31%) were females. Distribution of participants showed that 28% were in the 4th year, 15% in the 5th year, and 51% in the 6th year.

Section 1
Questions in this section were designed to determine the depth of participants’ knowledge of neurology. The students were asked to rate their level of knowledge of 7 medical specialties in comparison with neurology. Participants rated neurology least, followed by rheumatology and geriatrics and endocrinology were rated highest (Fig 1). The difference was statistically significant (P<0.05). A total of 296 responses were given to the question on how easy it was to make neurological diagnosis. Students were not very confident to make diagnosis of neurological disorders. Close to 46% of them believed making neurologic diagnosis is moderate to very difficult, while 8% opined it was relatively ease (Table 1). With regards to their opinion on management of neurologic disorders, 16% of participants felt it was moderate to very difficult, while 30% gave no response. Students were also asked the setting they learnt neurology most in medical college. Close to 82% indicated they learnt the most from bedside teaching and 59% from use of medical textbooks. Other common ways by which the students felt they learnt neurology were classroom lectures (38%) and from online resources (13%). Only 6% indicated they learnt neurology from peers during group discussion (Fig 2).

Section 2
This section was mainly to determine why participants found neurology difficult and ways whereby teaching of neurosciences in medical schools could be improved upon. Of the basic medical science subjects, histology and biochemistry were found least useful by this group of students. They found physiology and morbid anatomy most helpful to learn neurology, with mean score (SD) of 2.9 ± 0.5 and 2.7 ± 0.4, respectively (Fig 3). Two open questions were included in the questionnaire. The first was why participants felt neurology was difficult. The most frequent reasons given were difficulty with neuroanatomy teachings (49%), occurrence of complex diagnoses (35%), insufficient teaching (32%) and inadequate neurology teachers (32%) [Table 2]. About 25% of students had difficulty with neurologic examination. Responses to question on quality of teaching of neuroscience courses received in preclinical and clinical year had a maximum score of 5. There was a significant difference in the way students rated the teaching of basic neuroscience subjects of preclinical classes and clinical subjects. Lectures received in the clinical classes were rated higher than the preclinical ones with mean score (SD) 3.33 ± 0.6 vs. 2.49 ± 0.8, p < 0.05. Participants were also requested to rate their level of interest in the four neuroscience disciplines. A higher proportion of students were interested in Psychiatry (60%) and Psychology (51%) than in Neurosurgery (46%) and Neurology 49% (p < 0.05). Only 4% of the students indicated they would like to become a neurologist upon completion of their undergraduate study. The second open question asked the participants to give suggestion on ways neurology education can be improved on. There were 329 responses and these had been summarized under 8 main themes (Table1). The frequent suggestion was the need for more neurology teachings with emphasis on clinical and bedside teachings followed by provision of more teaching aids and models. The third most common suggestion was the demand for increase in the number of neurology lecturers in the faculty.

Discussion
Clinical students were chosen in this study in order to relate usefulness of basic neuroscience courses to their clinical clerkship. The findings of this study showed that Nigerian medical students perceived neurology to be the most difficult of all medical specialties. This is evident by respondents’ rating of their knowledge of neurology least of all the eight medical disciplines. The subjects they felt they were most knowledgeable about was gastroenterology followed by nephrology. It was surprising that participants rated their knowledge of neurology below geriatrics and rheumatology, two specialties that are just being developed in most medical schools in Nigeria. It is presently difficult to give a reason for such response. Participants felt they learnt neurology most during ward rounds. This observation underscores the effectiveness of traditional clerkship and bedside teachings whereby signs are demonstrated to clinical students. Other ways by which the participants learnt neurology most were through seminars, bedside teachings and use of medical
textbooks. Our result compares with those of Schon et al from UK [3] and that of Flagan et al in Ireland [13]. In both studies students felt they were most knowledgeable of gastroenterology and considered neurology to be the most difficult of all medical specialties. The results of these studies and ours were on students’ opinion and may not reflect the depth of their knowledge of these disciplines. Nevertheless, the finding is noteworthy and may require further study to relate their actual school performances with their opinions.

Of all the preclinical courses, histology and biochemistry were indicated to be least helpful for learning neurology. These 2 courses are usually taught early in medical schools in Nigeria. It may be that the subjects were taught in an unrelated manner so that it gave an impression they were unimportant in the later part of their training as earlier suggested [3]. Part of the reasons why the students found neurology particularly difficult is that they had trouble in understanding neuroanatomy along with availability of limited number of teaching aids. They also had problem with too many complex diagnoses made by neurologists. Trouble with neuroanatomy is particularly a recurring theme from several similar studies [13]. The main reason that had been adduced for this is the abstract manner in which neuroanatomy had been taught, and there are opinions that this needs to be changed. This abstract method requires visuospatial activity, a function of right cortex that is best suited for Faculty of Arts students rather than medical student. Even though the structure and functions of the entire central nervous systems may be complex than most body organs, neurology is not so complicated if taught from basics and in a simplified manner in relation to common diseases [3].

Another interesting finding of this study is that only 6% of the participants indicated they learned neurology from their colleagues. It could be inferred that only few medical undergraduates in this study practice small group discussions with their peers. This observation is pertinent because doctors often do not practice in isolation, but rather as a team with colleagues and other health care workers. Thus, these students might find it difficult to work with colleagues and other members of health team after graduation. A study that had looked at ways to improve medical education had suggested introduction of small group discussion. This is likely to encourage team work, increase students’ comprehension and make them lifelong learner [14]. Over 15 % of our participants found online resources very useful for learning neurology. This proportion is more than 1% of student reported from Ireland [13] but less than the proportion of US students that reported that online resources are veritable tool for neurology education [15]. A recent study on alternative ways to facilitate learning of basic and clinical neurology in USA found use of e-textbook a good alternative [16]. The conclusion of the study was that after 6 years of introduction of e-textbook and online resources, neurology education was made easier with marked increase in student’s satisfaction with the subject [16].

Unfocused teaching in neurology is another reason that has been found to be responsible for why doctors and medical students are neurophobic. Neurologists in the past do proud themselves during ward rounds about making complex diagnoses of rare disorders and unusual syndromes more than any other medical specialties [12]. This view was corroborated by responses of more than a third of our students’ responses that they had problems with the complex diagnoses made in this specialty. To overcome this view teaching of clinical neurology should focus more on common disorders and in a simplified terminology. Over 52% of the students proposed provision of more teachings in neurology and increase in number of neurology teachers as ways to improve on neurology education. We believe this suggestion is crucial to improvement of neurology education in Nigeria. The work of Ridsdale et al from UK supported this view [12]. In the report after neurology had been taught for 13weeks and mostly in consultant-led teachings, students’ understanding and rating of neurology was comparable to other medical disciplines, while their skill of neurology examination was greatly improved upon [12]. The use of small group bedside teachings which the students found most beneficial will also facilitate better understanding of the subject. Therefore, provision of more focused teaching along with increase
length of neurology course will help prevent phobia for neurology by students and doctors. Furthermore, there is critical need to encourage specialization in this discipline based on the recent disturbing report that the number of neurologist in most African countries is very few with estimate of 0.03 Neurologist per 100,000 populations [17]. Nigeria with current estimated population size of 140 million [15] have only 50 registered Neurologists [18]. More Neurologists are needed in developing countries as practitioners to improve neurological practices and also as educators and health policy advisers and advocates. Unfortunately, only 4% of this cross section of medical students were interested in specializing in neurology. Thus, the teaching of clinical neurology will still have to depend on non- neurology specialists in most medical schools.

Conclusions
In conclusion, results of this study confirmed that medical students perceived neurology as a difficult subject than other medical subjects. This is likely to be the view of majority of medical undergraduates in Nigeria because the study participants were drawn from three medical schools in the country. This negative perception of neurology could be a hindrance to the practice of the discipline. Majority of the students are not interested in specializing in neurology and felt there is need to improve on the neurology education in our medical schools. From the given responses, students appeared ill-prepared to face the challenge of managing neurological disorders. Introduction of e-textbooks and online resources may likely facilitate better learning of neurology.

Competing interests
The authors declare that they have no competing interests.

Authors' contributions
EOS and OEA conceived the study. EOS coordinated the study, analyzed the data and drafted the initial manuscript. The collection of data and review of initial manuscript were carried out EOS, OEA and TOO. All authors read and approved the final manuscript.

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References
Figure 1: Self-rated knowledge of neurology in comparison to other subjects

Keys: car-cardiology; endo-endocrinology; derm-dermatology; ger-gerontology; gast-gastroenterology; neph-nephrology; neur- neurology; rheu- rheumatology.
Figure 2: where students learn neurology most

Keys: beds teach- bedside teachings; class lec- classroom lectures
Figure 3: How helpful are basic neuroscience courses to clinical clerkship
Additional files provided with this submission:

Additional file 1: Table 1 neurophobia.docx, 10K
http://www.biomedcentral.com/imedia/1224581934542226/supp1.docx
Additional file 2: Table 2 neurophobia.docx, 11K
http://www.biomedcentral.com/imedia/1242272533345529/supp2.docx