Combating Neurophobia and Addressing the Challenges in Neurology Education for Medical Students

Hassan Farid - Neurology Clinical Teaching Fellow ; **Hena Ahmad** – Consultant Neurologist and Clinical Neuroscience Teaching Lead
St. Georges University of London and St. Georges University Hospital

Why Is This Important ?

" Neurology is a complex specialty "
" Neurology is a difficult subject " " I never plan to be a neurologist " ,

We frequently hear these kind of comments from the students at the beginning of their placement and wanted to understand the underlying reasons and deal with neurophobia in medical students.

Introduction

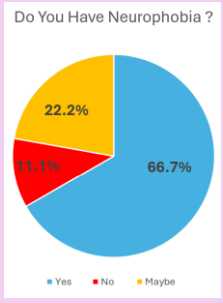
- The existence of a fear of neurology among medical students has been acknowledged for a considerable period of time. The word "neurophobia" was first used in 1994 by Jozefowicz Research has shown that it is widespread among medical students and junior physicians [1, 2].
- Neurology educators asserted that the complexity of neurology is primarily influenced by the acquisition of fundamental neurosciences. This underscores the necessity of bridging the basic neuroscience education and clinical training [3]
- Educational theory postulates a robust correlation between teachers and student learning. Teachers have a vital role in developing educational policies and influencing the way students perceive the learning environment [4]. Gathering student feedback on teaching practice is often used in educational settings to improve teaching techniques and assess performance [5].

Methods

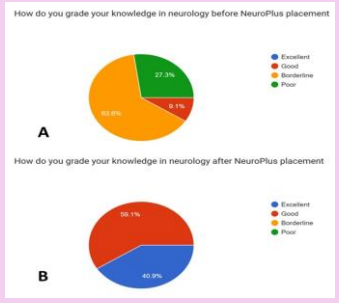
- An anonymized feedback evaluation form was distributed to a group of 35 Penultimate year medical students (22 respondents, response rate = 62.85%) at St. George's University of London medical school using Google Forms to assess their educational experience in a neurology placement.
- Percentage of students who experienced neurophobia was assessed, followed by a reflection on their level of knowledge before and after the placement. The evaluation covered three settings: bedside teaching, clinical skills and case-based lectures. In each setting, students rated the effectiveness of the teaching methods and assessed the level and interactivity of the teaching.
- A chi-square test evaluated the statistical significance of the categorical data.

Results

- The current survey found that 66.7% of students have neurophobia **(Figure 1)**.
- The grading of knowledge in Neurology before and after the placement teaching indicated that most students (N=14; 63.3%) had borderline knowledge before placement **(Figure 2 A)**, however following placement **(Figure 2 B)**, all the students reported either good (N=13; 59.1%) or excellent (N=9; 40.9%) knowledge and this difference is statistically highly significant (p-Value < 0.01).



(Figure 1)



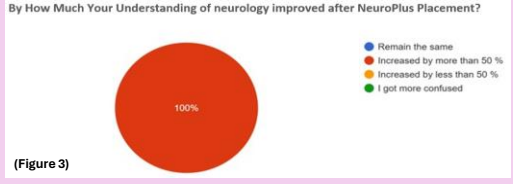
(Figure 2)

- Feedback on challenges faced by students in studying neurology has been categorised into eight themes as shown in Table 1.

(Table 1) **The causes of difficulties in studying neurology (n = 22)**

Cause	Frequency (%)
Difficulty in localizing lesions and understanding neuroanatomy	15 (68.1%)
Challenges in differential diagnosis	6 (3.0%)
Difficulty in understanding neurological terminology and concepts	4 (18.1%)
Volume of content and complexity	3 (13.6%)
Challenges in neurological examination particularly the cranial nerves examination	3 (13.6%)
Linking clinical context and physiology	2 (9.1%)
Need for review and consolidation	2 (9.1%)
Dislike or frustration with neurology	1 (4.5%)

- The survey also found that all of the students found that the placement teaching improved their understanding by more than 50% **(Figure 3)**.



(Figure 3)

How to Combat Neurophobia and Improve students' experiences ? Examples of students' voices

- To combat neurophobia and improve student experiences, we integrated bedside teaching for direct patient interaction, case-based teaching for practical applications, and demonstrations / simulation-based teaching for hands-on experience in a controlled environment. These methods boost confidence, foster critical thinking, and reduce anxiety, enhancing neurological education.
- **Bedside Teaching:** Medical education has transitioned from passive lecture-based learning to student-centered, active approaches like bedside teaching, fostering critical thinking and knowledge synthesis over mere memorization [6].
- **Clinical Cases Teaching:** Global health education is shifting to case-based learning (CBL), using realistic clinical cases to develop essential skills. Research shows CBL streamlines curriculum changes, enhancing the educational experience [7 – 9].
- **Clinical Skills Teaching:** Medical education has embraced simulation or live demonstration-based teaching to enhance learning. It revolutionizes lectures by offering practical simulations that replicate real-life scenarios, enabling safe skill practice [10].
- The students experiences and comments were shown in the Table 2-4.

(Table 2)

Bedside Teaching		
Engagement	The teachings have an engaging style, are interactive, and provide a comfortable learning environment.	8 (36.3%)
Effectiveness	The teachings are useful, and there is a benefit of clinical-theoretical integration.	17 (77.2%)
Structure and preparation	The teachings are thorough, and there is value in detailed mentor-student (one-to-one) feedback.	10 (45.4%)
Timing and frequency	There is a need for additional similar teaching opportunities over different time periods to compare the performance and the progression.	16 (72.7%)

(Table 2)

Clinical Cases Teaching		
Engagement	The lectures are interactive, have group discussions, and have an engaging style.	7 (31.8%)
Effectiveness	The materials are comprehensive, of high quality, have well-organised slides, and contain useful and relevant cases.	18 (81.8%)
Structure and preparation	The lectures have logical incorporation, and they link the basics with clinical information.	3 (13.6%)
Timing and frequency	The lectures are long in terms of duration, and there is a lack of breaks.	1 (4.5%)

(Table 3)

Clinical Skills Teaching		
Engagement	The sessions are motivating, have an encouraging style, and are interactive.	5 (22.7%)
Effectiveness	The sessions are effective methods for clinical skill learning and have a recognised style of repetition to consolidate the knowledge.	20 (90.9%)
Structure and preparation	The preparation of teaching material and the use of pictures and video demonstrations help understand the clinical signs.	5 (22.7%)
Timing and frequency	There is a need to increase the time to allow more clinical practice.	2 (9.1%)

Conclusions and Recommendations

- The students reported significant improvement in their knowledge following our Neurology placement and they acknowledged the engagement, effectiveness, structure, and preparation of our teaching sessions.
- We recommend case-based, bedside teaching and live clinical demonstrations or simulations for clinical neurology teaching, noting that these methods help combat neurophobia. It also emphasised the importance of maintaining interactive, engaging, and well-structured teaching methods.
- Receiving and acting on student feedback is crucial in medical education, as it enhances learning and understanding. Additionally, addressing challenges in teaching is essential to continually improving the educational experience.

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