

## Attitudes Toward Neurosciences in Medical Students in Wuhan, China: A Survey Study

Rimas V. Lukas<sup>1</sup>, Brian Cooper<sup>2</sup>, Ivy Morgan<sup>2</sup>, James R. Brorson<sup>1</sup>, Hongmei Dong<sup>2</sup>, Renslow Sherer<sup>2</sup>

■ **BACKGROUND:** Neurophobia is a well-described phenomenon among medical students in many countries. Little is reported concerning the perceptions of neurosciences among medical students in China.

■ **METHODS:** We surveyed senior medical students in Wuhan, China, on their perceptions of neuroscience.

■ **RESULTS:** Students' self-assessments of knowledge in various specialties ranked neurology low, but not the lowest. Students' confidence in diagnosing neurological patients and managing neurological patients demonstrated significant correlation. A positive correlation was noted between confidence in these clinical parameters and the likelihood of specializing in neurology. Students reported bedside teaching and small group sessions as having the greatest value in learning neurology.

■ **CONCLUSIONS:** The low, but not the lowest ranking of self-perceived knowledge in neurology by medical students in Wuhan, China, differs from findings reported in other countries. In this exploratory study the investigators hypothesize that the well-described phenomenon of neurophobia may exhibit a less pronounced influence in Wuhan, China.

### INTRODUCTION

Neurophobia refers to medical students' dislike of neuroscience based on the perception that it is overly complex. It is theorized that neurophobia arises from the unintegrated teaching of basic neurosciences and clinical

neurology (4). This is of concern as neurological disorders are common and associated with significant morbidity and mortality (1). In addition, a significant portion of neurological care is performed by primary care providers (6). This underlines the importance of neuroscience education for students who will pursue specialization in this field and those who will not.

Neurophobia is a phenomenon that has been reported in numerous countries (2, 3, 5, 7, 8, 12, 13).

Little is known regarding neurophobia in China where neurology is a rapidly growing specialty that attracts "high-quality medical graduates" (10). No equivalent term describes neurophobia in the Chinese language leading to speculation that neurophobia as a phenomenon is largely unrecognized in China. To characterize the attitudes of medical students toward clinical neurology and the neurosciences we developed and administered a survey to senior medical students in Wuhan, China.

### METHODS

To assess the attitudes of medical students toward neuroscience we designed a brief 5-question survey (Figure 1) and administered it to a convenience sample of 41 fifth, sixth, and seventh year students (analogous to third and fourth year U.S. medical students). Surveys were received from 22 fifth year students, 9 sixth year students, and 10 seventh year students. Informed verbal consent was obtained from all participants under a protocol approved by our Institutional Review Board. Neuroscience education for medical students at Wuhan University in Wuhan, Hubei province, China, is undergoing significant reform as part of a collaborative undertaking with the University of Chicago through the Wuhan University Medical Education Reform project (9). We gave out our survey before implementation of the revised neuroscience curriculum in autumn of 2011 to provide a baseline assessment of students' perceptions of neurology.

### Key words

- China
- Education
- Medical student
- Neurology
- Neurophobia
- Neuroscience
- Surveys

### Abbreviations and Acronyms

- CI: Confidence interval
- SD: Standard deviation



From the Departments of <sup>1</sup>Neurology and <sup>2</sup>Medicine, Section of Infectious Diseases and Global Health, University of Chicago, Chicago, Illinois, USA

To whom correspondence should be addressed: Rimas V. Lukas, M.D.  
[E-mail: [rlukas@neurology.bsd.uchicago.edu](mailto:rlukas@neurology.bsd.uchicago.edu)]

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Class year:	1	2	3	4	5	6	7
Please rate the following questions.							
Scale: 1=lowest/least likely to 5=highest/most likely							
1. Rate your knowledge in the following specialties:							
A. Cardiology	1	2	3	4	5		
B. Gastroenterology	1	2	3	4	5		
C. Pulmonary	1	2	3	4	5		
D. Neurology	1	2	3	4	5		
E. Rheumatology	1	2	3	4	5		
F. Endocrinology	1	2	3	4	5		
G. Geriatrics	1	2	3	4	5		
H. Nephrology	1	2	3	4	5		
2. Rate your confidence in diagnosing patients with neurological problems:							
	1	2	3	4	5		
3. Rate your confidence in managing patients with neurological problems:							
	1	2	3	4	5		
4. Rate your likelihood to specialize in neurology after completing medical education:							
	1	2	3	4	5		
5. Rate the following teaching methods for you learning neurology:							
Bedside teaching	1	2	3	4	5		
Formal lectures	1	2	3	4	5		
Small group sessions	1	2	3	4	5		
Textbooks	1	2	3	4	5		
Internet/web	1	2	3	4	5		
Peers/other students	1	2	3	4	5		

  

年级	1	2	3	4	5	6	7
请给下列问题打分							
分值: 1=最低分/最不可能.....5=最高分/最可能							
1. 请根据你对下列专业知识的了解程度打分							
A. 心内	1	2	3	4	5		
B. 消化	1	2	3	4	5		
C. 呼吸	1	2	3	4	5		
D. 神经内科	1	2	3	4	5		
E. 风湿病	1	2	3	4	5		
F. 内分泌	1	2	3	4	5		
G. 老年病	1	2	3	4	5		
H. 肾脏病	1	2	3	4	5		
2. 针对有神经性问题的病人, 请给出您诊断病人的自信心程度							
	1	2	3	4	5		
3. 针对有神经性问题的病人, 请给出您管理病人的自信心程度							
	1	2	3	4	5		
4. 请您就在完成医学教育后从事神经学专业的可能程度打分							
	1	2	3	4	5		
5. 请就以下神经学教学方法打分							
病床边教学	1	2	3	4	5		
正式讲座	1	2	3	4	5		
小组讨论	1	2	3	4	5		
教材	1	2	3	4	5		
网络资源	1	2	3	4	5		
同伴教学/同学	1	2	3	4	5		

**Figure 1.** (A) English language version of the survey using a Likert scale with 1 representing "lowest/least likely" and 5 representing "highest/most likely". (B) A Chinese language translation of the survey administered to the students at Wuhan University.

Modeled on previously reported surveys given to medical students in medical schools in other countries (7, 13), the surveys addressed students' self-assessments of their knowledge of specialties, confidence in clinical neurology and career intentions, and their perception of teaching methods, with responses from 1–5 on a Likert scale (lowest/least likely was represented by 1 and highest/

most likely by 5). The survey was translated from English to Chinese by the investigators with input from faculty at Wuhan University.

The first question of the survey queried students on their perceived knowledge in 8 specialties, whereas questions 2 to 4 asked students about their confidence in diagnosing and managing patients in clinical neurology and their likelihood of specializing in neurology after completing medical education. The final question asked students to rate a number of teaching methods for learning neurology (Figure 1).

Paired sample t-tests were performed to compare the means of the scores for students' self-perceived knowledge in medical specialties. Pearson's correlation coefficient was used to measure the degree of correlation between students' self-perceived confidence in making diagnoses in neurology and managing neurological patients. It was also used to measure the correlation between the mean score for confidence in diagnosing and managing neurological patients with their likelihood of specializing in neurology after completing medical education. Similar methods were used to evaluate the correlation between the likelihood of specializing in neurology and students' perceived knowledge in neurology. Repeated measures analysis was used to compare the means of students' perceptions of the value of various teaching methods on learning neurology.

## RESULTS AND DISCUSSION

All 41 surveys (100%) administered to students at 2 class 3 hospitals were returned. Twenty-one were from students at the Renmin Hospital site and 20 from the Zhongnan Hospital site. In students' self-assessment of knowledge in 8 medical specialties, neurology received a mean score of 2.78 (95% confidence interval [CI] 2.45–3.07, standard deviation [SD] 0.943), ranking it the sixth lowest (Table 1). Paired sample t-tests found student knowledge in neurology was significantly lower than in the 3 top specialties. Neurology rated significantly lower than pulmonary ( $t = -3.136$ ,  $df = 38$ ,  $P = 0.003$ ), nephrology ( $t = -2.731$ ,  $df = 39$ ,  $P = 0.009$ ), and gastroenterology ( $t = -2.793$ ,  $df = 39$ ,  $P = 0.008$ ). There were no statistically significant differences between neurology and the other 4 specialties. Students' self-perceived knowledge of neurology was in the mid-range among the presented specialties.

We found a significant correlation between the two aspects of clinical confidence queried: diagnosing and managing ( $r = 0.653$ ,  $P < 0.0001$ ). The average of the scores reported in these two clinical areas demonstrated no statistically significant difference in students by year; however, there was a positive trend between increasing years of training and increasing confidence. A weak but notable positive correlation was also seen between the mean of the two confidence scores and the likelihood that a student would specialize in neurology ( $r = 0.283$ ,  $P = 0.037$ ) (Table 2). As expected, students with low confidence in diagnosing and managing neurological patients trended toward a lower likelihood of specializing in neurology. In addition, we noted a positive correlation between the likelihood of specializing in neurology and students' self-perceived knowledge in this specialty ( $r = 0.4$ ,  $P = 0.005$ ).

Students rated bedside teaching (mean = 4.03, 95% CI 3.69–4.37, SD 1.00) as having the greatest value in learning neurology. This was followed by small group teaching (mean = 3.78, 95% CI 3.42–4.14, SD 1.072). Learning derived from peers was rated lowest (mean = 3.30, 95% CI 2.98–3.63, SD 0.951).

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