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Medical students' perception toward neurosurgery as a career: a cross-sectional study

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Abstract

Background This study aims to access the perspective of medical students toward practicing neurosurgery after MBBS and also to identify factors responsible for low affinity among medical students in pursuing neurosurgery as a career. In this cross-sectional study, medical students were surveyed via pre-tested questionnaire, with a four-point Likert scale to determine their influence on student's consideration of neurosurgery as a career. Data analysis was performed using SPSS software.

Results The survey was completed by 185 students out of which 56.2% students considered neurosurgery as a career. Although more than 90% students acknowledged that neurosurgery training is too prolonged and it can also impede family life but huge prestige and income is attached to neurosurgery, 35.7% students shared that neurosurgery exposure and teaching is not adequate enough for them in order to have a positive influence toward neurosurgery as a career.

Conclusion Additional studies are required to further explore how participation in a formal neurosurgery experience can alter medical students' perceptions and influences their consideration of neurosurgery as career choice.

Keywords Neurosurgery, Career, Medical students

Background

Neurosurgery being a dynamic surgical specialty embraces the art of innovation and allows a variety of sub-specialization. Due to this fact, we would expect it to be one of the most considerable fields to pursue among medical students, but is it really the case? Studies have shown that there is a distinct lack of interest in medical students all over the world, choosing a career in surgery let alone the branch of neurosurgery. Only one-third

medical students shows affinity for surgical field in Pakistan [1], and statistics from different parts of the world have reported a decline in medical students choosing surgical field [2].

Number of students pursuing neurosurgery is low so demand of neurosurgeons goes unmet in the whole world. A study has shown that each year, a drastic number of 22.6 million people suffer from illnesses which ultimately require neurosurgical care. In low- and middle-income countries, more than 5 million neurosurgical cases are expected to be addressed by additional 23,300 neurosurgeons—that go unmet each year [3]. From global point of view, limited access to neurosurgical care comes as a challenge where neurosurgeons number is as low as 49,960, estimated in 2019 [4], especially in developing countries such as Pakistan where 200 million

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population is served by 212 neurosurgeons with 415 trainees nationwide [5]. These low numbers indicate that choosing neurosurgery as a career by medical students is as rare as finding a four-leaf clover.

A number of reasons are found to be the cause of medical students' deviation from neurosurgery like poor social and professional life balance, male oriented working environment, tough competition and long working hours. A lot of hard work, commitment and passion is needed to complete the surgical training since it is a very time-taking process. According to a study, 3963 h was approximated to be the total average time for surgical training, which is a major concern for medical students for its not favorable for majority of them to select a time-consuming speciality [6]. A research conducted in the United Kingdom comprising of 76 medical students, a poor social-work-life balance and competitiveness were found to be the main factors discouraging medical students to pursue a career in neurosurgery [7]. Another important cause affecting the medical students' interest in this field is a lot of medical accountability and risk of misconduct or malpractice. A recent report addresses physician career satisfaction and neurosurgeons were at the bottom of the list of different medical specialties [8].

Different studies have concluded that some variable factors exist due to which neurosurgical field is less favorable among medical students. But, few studies have highlighted factors that can help to increase neurosurgical recruitment according to medical students perception. It is important to understand that their perception can lead us to find strategies which will have a positive impact on medical students to pursue neurosurgery and that will also be a global help.

Since there has been no such research conducted here in Pakistan, the primary objective of this analysis will be to find out what are different thoughts and perceptions of medical students regarding neurosurgery. And the secondary objective would be to figure out the hindrances that are causing this major shift of interest from neurosurgery.

Methods

A cross-sectional study was conducted using convenience sampling technique, at Dow Medical College, Karachi, from July 2022 to August 2022, after obtaining approval from the institutional review board of Dow University of Health Sciences.

Participation of 185 students was entertained. Sample size was calculated from OpenEpi version 3.01 with confidence level 95% with 5% confidence limit on the basis of 14% prevalence among participants of an international study [6]. It is a pre-tested questionnaire survey comprising of two parts. First part has sociodemographic

Table 1 Pro forma: medical students' perception toward neurosurgery as a career

	1	2	3	4
Age:				
Gender: Male () Female ()				
Marital Status: Single () Married () Engaged () Divorced ()				
Nationality: Pakistani () Non-Pakistani ()				
Year of study: 3rd Year () 4th Year () 5th Year				
Response Categories: 1—Disagree; 2—Agree somewhat; 3—Agree moderately; 4—Agree strongly				
My neurosurgery teaching is adequate	()	()	()	()
I consider neurosurgery as a career option	()	()	()	()
Neurosurgical history is difficult to obtain	()	()	()	()
Neurosurgical signs are difficult to elicit	()	()	()	()
Limited interventions are available in neurosurgery	()	()	()	()
Neurosurgical illnesses are complicated and difficult	()	()	()	()
Neurosurgical illnesses are challenging and interesting	()	()	()	()
Most Neurosurgical illnesses have poor outcomes	()	()	()	()
Neurosurgery requires a long training period	()	()	()	()
Neurosurgery involves long operating hours	()	()	()	()
Huge prestige and income is attached to neurosurgery	()	()	()	()
Neurosurgery can impede family life	()	()	()	()
Neurosurgery training in Pakistan is too prolonged	()	()	()	()
Neurosurgery training centers in Pakistan are few	()	()	()	()
Future job opportunities will be limited	()	()	()	()

characteristics of the participants. The second part consists of 15 items based on a Likert ranking scale (1, disagree; 2, agree somewhat; 3, agree moderately; 4, agree strongly). This questionnaire has been validated and used in international study that has been published [6] (Table 1). We conducted a pilot study with a small group of medical students to assess the clarity, comprehensibility, and relevance of the survey items. Based on their feedback, we made necessary modifications to improve the survey's validity and reliability.

The study evaluated the perspective of medical students currently studying in third year, fourth year and final year MBBS, regarding career in neurosurgery. Relevant data were collected with informed consent. Information on participant's age, gender, marital status, nationality and year of study was recruited. Throughout the study, confidentiality of collected data was maintained. SPSS version 21 software was used as a tool to analyze the data. Data were presented as frequency and percentages (%) and reported based on Likert scale.

Results

In this study, 186 medical students completed the questionnaire in which 82.3% participants were females and 17.7% were males (152 females and 33 males) (Figure 1A).

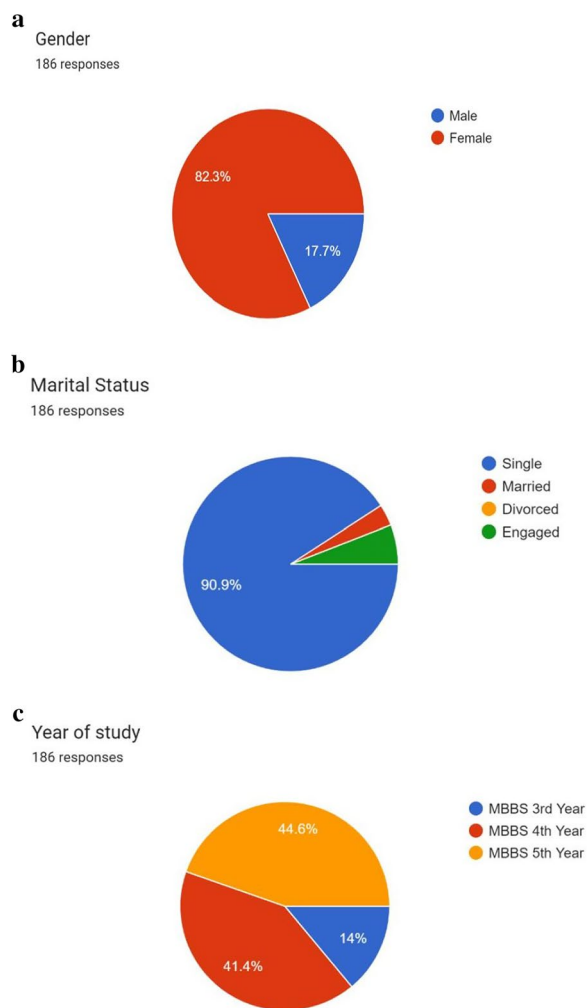


Fig. 1 a Gender of participants. b Marital status of participants. c Year of study of participants

The response rate for our study was 62%. We achieved this by distributing the survey to 300 medical students, and we received responses from 186 participants. Mean

age of participants was 22.7 years ± 1.00 Standard Deviation (Range 19–25 years). 90.9% participants are single, while 10.1% are married/engaged (Figure 1B). 44.6% of participants were from 5th year, 41.4% of participants were from 4th year and 14% of participants were from 3rd year MBBS (83 fifth year, 76 fourth year and 26 third year) (Figure 1C). Results of Likert scale are presented in Figures 2, 3, 4 and Table 2.

Discussion

In the past few years, there have been significant changes in the medical sector, including technological advancements, research and the entry of more women and minorities as medical students [9]. Interns’ and medical students’ effect on choosing a specialty can be influenced by a variety of circumstances. According to a previous survey, the majority of medical students had negative attitudes of the specialty of neurosurgery [10]. In contrast, in the current survey, more than half of the research population wants to pursue neurosurgery as a career. However, their opinions about the field regarding long training period, difficulty in obtaining neurosurgical signs, effect on family life and lack of training centers in Pakistan for the field remain the same as previous studies around the world [11, 12].

Saudi Medical Students have an overall favorable opinion for neurosurgery. According to the study, interest in neurosurgery as a specialization may improve if students and interns are more exposed to the field. The majority of people view neurology and neurosurgery as challenging yet fascinating fields of study. Additionally, the majority of them said that the field’s excellent reputation and high salaries were significant elements, which became a major factor in choosing neurosurgery as a career [13].

Akhigbe et al., in his study showed that students believed that their neurosurgical training is insufficient. 78% of the Irish medical students in their last year were choosing neurosurgery as their preferred field of study.

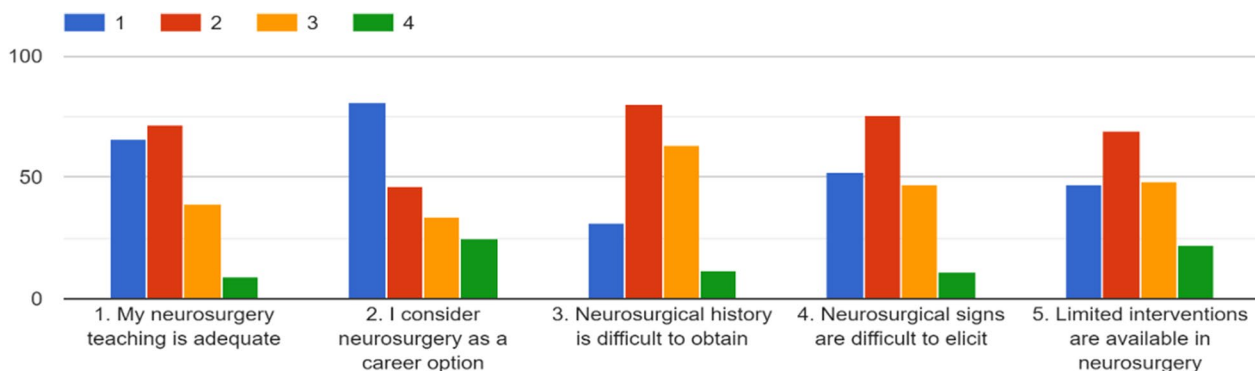


Fig. 2 Bar chart showing responses in Likert scale (1–4)

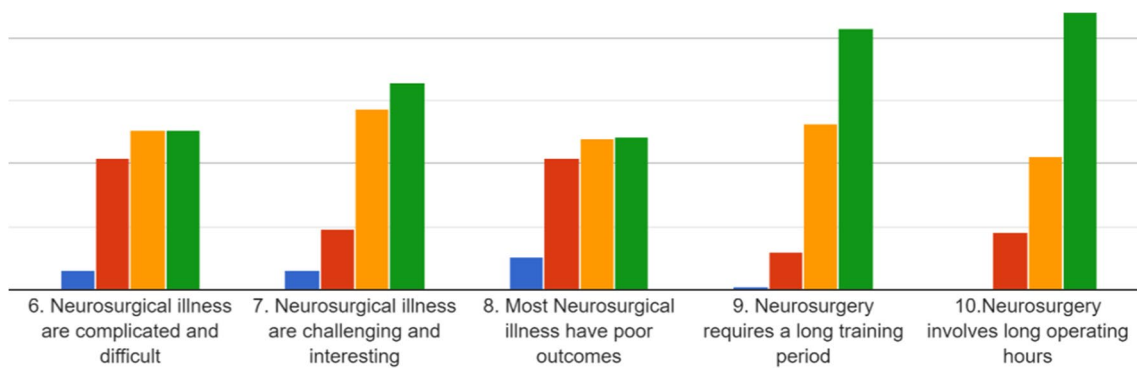


Fig. 3 Bar chart showing responses in Likert scale (1–4)

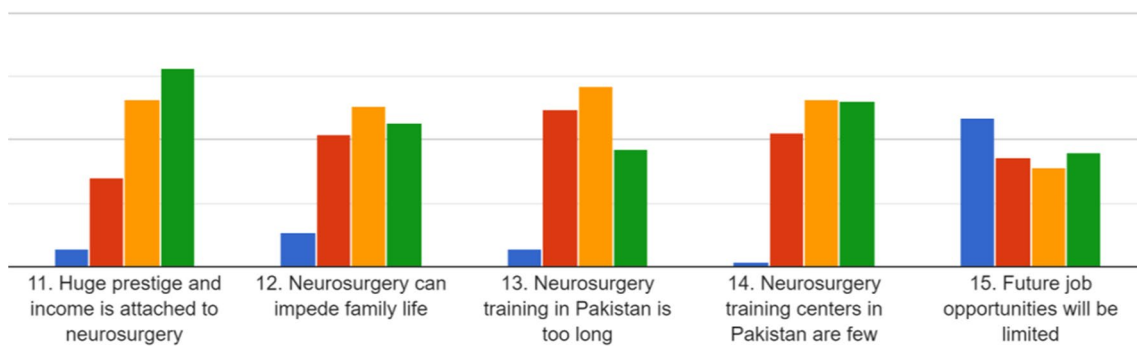


Fig. 4 Bar chart showing responses in Likert scale (1–4)

Table 2 Items on Likert scale

	Disagree agree	(Likert 2–4)
My neurosurgery teaching is adequate	66 (35.7%)	119 (64.3%)
I consider neurosurgery as a career option	81 (43.8%)	104 (56.2%)
Neurosurgical history is difficult to obtain	31 (16.8%)	154 (83.2%)
Neurosurgical signs are difficult to elicit	51 (27.6%)	134 (72.4%)
Limited interventions are available in neurosurgery	46 (24.9%)	139 (75.1%)
Neurosurgical illnesses are complicated and difficult	8 (4.3%)	177 (95.7%)
Neurosurgical illnesses are challenging and interesting	8 (4.3%)	177 (95.7%)
Most Neurosurgical illnesses have poor outcomes	13 (7.0%)	172 (93.0%)
Neurosurgery requires a long training period	1 (0.5%)	184 (99.5%)
Neurosurgery involves long operating hours	0 (0.0%)	185 (100.0%)
Huge prestige and income is attached to neurosurgery	7 (3.8%)	178 (96.2%)
Neurosurgery can impede family life	14 (7.6%)	171 (92.4%)
Neurosurgery training in Pakistan is too prolonged	7 (3.8%)	178 (96.2%)
Neurosurgery training centers in Pakistan are few	2 (1.1%)	183 (98.9%)
Future job opportunities will be limited	58 (31.4%)	127 (68.6%)

Numerous factors, such as a manageable lifestyle, the duration of the residency program, money, and employment chances, have been linked to the shift in medical students’ interests away from neurosurgery [13].

Difficult nature of neurosurgical cases and the lack of a neurosurgery residency program in Oman were both cited as major drawbacks of neurosurgery in Oman. The presence of a mentor in neurosurgery has been

shown to improve medical students' interest in this profession by 98% [10].

Moreover, a training camp for students interested in a neurosurgery subinternship was successful in increasing transparency and positively affecting the aspects of a career in neurosurgery that interest and worry students. A large, country-wide cohort of students from USA, seeking subinternships, was used to identify medical students' perception of neurosurgery. The latter provided novel data and revealed that work-life balance and competitiveness were the most frequently mentioned factors that worried students about pursuing a career in neurosurgery [14].

Hence, neurosurgery continues to be one of the most challenging cum admiring field across the world that draws excellent graduates but at the same time, it has some very realistic and significant challenges which needs to be resolved [10].

Initially, implementing university-based interest groups will pique students' attention, and faculty participation in leading educational programs and joint research will be strengthened. National as well as international associations should be created for assistance medical students in their early exposure to neurosurgery. Also modification of the curriculum with improved execution, effectively working on reducing stigmas related to persuasion of the field, could also be an effective initiative [15].

Conclusions

It was concluded from the research that majority of medical students (more than 50%) showed affinity toward neurosurgery as a career but still the annual induction rate for neurosurgery postgraduate program is very low in Pakistan. Further studies are required to find out the cause behind, and additional studies are also recommended to further explore how participation in a formal neurosurgery experience can alter medical students' perception and influence their consideration of neurosurgery as a career choice.

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Author contributions

MK produced the topic and study design. MK analyzed all the data. AA wrote the introduction. SA revised the article. YZ did the literature review. MTA supervised the project. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical approval and consent to participate

Dow University of Health Sciences (Ref IRB-2490/DUHS/Approval/2022/874).

Consent for publication

Consent for publication was obtained from the participant.

Competing interests

The authors declare that they have no competing interests.

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