

# Neurology as a Career Option Among Medical Students of Public Sector Universities of Karachi

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## ABSTRACT

**Background:** Neurological diseases are highly prevalent in the world. Despite a high load of such patients, one consultant is catering to one million neurological patients in Pakistan. There is a significant need for students to practice neurology. However, students are reluctant to establish a career in neurology. This research focuses on investigating possible causative factors for the apparent lack of enthusiasm regarding neurology amongst medical students of public universities of Karachi and proposes various methods for eradicating this issue.

**Materials and Methods:** A cross-sectional study was conducted on 456 medical students of public universities of Karachi, Pakistan. The study was undertaken using a pretested questionnaire from January 2020 to February 2020. Twenty-five influence factors were listed in the questionnaire, and respondents were asked to choose from two options. Pearson's Chi-Square Test analyzed responses to form a categorical distribution of responses between the two groups with significance established at  $p < 0.05$ .

**Results:** 29.2% of participants chose for a Neurology career, while 70.8% did not. Of the ones that chose neurology, the most common factors influencing their decision were prestige in neurology (90.9%), acquiring medical knowledge (87.2%), and make a good treatment outcome in people's lives (86.4%). Among respondents who opted no, the predominant factor of influence was the course (55.7%).

**Conclusion:** The study highlights the gap between the increasing demand for neurologists and the number of students wanting to pursue a neurology career. It offers an insight into factors that widen this problem, and literature-based evidence on how to solve problems.

**KEYWORDS:** Neurology; Career; Medical students; Public universities

## INTRODUCTION

Neurological diseases are highly prevalent in the world, accounting for 6.3% of global morbidity and 12% of global mortality [1], which leads to a significant need for good treatment methods [2] and an increased requirement for students to enter the field [3]. Despite this, students are reluctant to establish a career in neurological sciences [2]. The field of Neurology is considered to be tougher than other fields, in terms of difficulty faced by students in understanding the subject and a clear disconnection with its

clinical applications [2,4]. Previous research show that the level of knowledge, among students, about neurological pathology, is inadequate as compared with other fields. Commonly, the causes were found to be incompetent methods of teaching, and a general intimidation of neurology because of its grinding reputation [4]. In the past, most universities in Pakistan did not even recognize the field as a compulsory specialty to be taught at the undergraduate level, and the ones that did have the department failed to give it

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the importance it deserved [5]. This leads to the prevalence of a relatively common 'burnout' amongst neurology residents and fellows, resulting in an unsatisfactory career [6].

In Pakistan, there is only one doctor available for every 1,254 patients [7]. With regards to the field of neurology, even though the patient influx for neurological problems is high [8], approximately only one consultant is catering to one million people [9]. Even at the undergraduate level, information discussing occupational choices amongst medical students is unavailable [10].

## MATERIALS AND METHODS

A cross-sectional study was conducted on a sample of 456 medical students from Dow University of Health Sciences and Jinnah Sindh Medical University, Karachi. The sample size was calculated through online software Open Epi version 3.0 with 99% Confidence Level and 5% Confidence limits. Data were collected using a pretested questionnaire. Twenty-five influence factors were listed and respondents were requested to choose from two answer options (yes or no). The study duration was about two months from January 2020 to February 2020. The exclusion criteria included

students of first and second year of MBBS and those unwilling to give their consent for participation. Data was analysed using Pearson's Chi-Square Test, to form a categorical distribution of the responses between the two groups with significance established at  $p < 0.05$ .

## RESULTS

Out of 456 participants, 138 were males while 318 were females. The majority of participants (70.8%) admitted that they do not plan to opt for a career in Neurology, while 29.2% of participants said that they do. The mean age was 22.5 years (Table 1). Out of those who agreed to choose Neurology, the major factors that influenced their decision included the following: to gain prestige involved in working in the neurological field (90.9%), to acquire broad medical knowledge (87.2%), to make a difference and a good treatment outcome in people's lives (86.4%), the content specialty (78.2%) and intellectual atmosphere in the field (84.2%), Neurology being a challenging specialty (78.2%), the variety of patients with different presenting conditions (74.4%), and personal preferences due to family histories (59.4%).

**Table 1:** Demographic characteristics of MBBS Students.

Characteristics	Number of Students	%
Age (in years)		
20	22	4.8
21	120	26.3
22	161	35.3
23	79	17.3
24	50	11
25	24	5.2
Gender		
Male	138	30.3
Female	318	69.7
Socio economic status		
Lower Class	4	0.9
Lower Middle	12	2.6
Middle Class	398	87.3
Upper Class	42	9.2
MBBS Year		
3rd Year	210	46.1
4th Year	198	43.4
Final year	48	10.5
Satisfied with Medical field		
No	56	12.3
Yes	400	87.7
Want to work in abroad		
No	248	54.4
Yes	208	45.6
Choose Neurology as a Career		
Yes	133	29.2
No	323	70.8

The minor factors of influence were found to be feasible working hours (21.8%), lack of physicians in the country (27.8%), having a mentor from the respective field (25.6%), and amount of education debt (18.0%); (Table 2).

Among the respondents who did not choose neurology as a career, the predominant factor of influence was found to be the difficulty of the course (55.7%). When comparing the responses

between the two groups, there were significant differences for the factor rating for the following factors of influence: feasible working hours ( $p$ -value 0.042), preferring to treat emergency cases ( $p$ -value 0.043), prestige in the field ( $p$ -value 0.011), challenging specialty ( $p$ -value 0.00), the intellectual atmosphere of the field ( $p$ -value 0.001), family pressure ( $p$ -value 0.031), balancing work life with family responsibility ( $p$ -value 0.00), to acquire broad medical knowledge ( $p$ -value 0.001); (Table 3).

**Table 2:** Factor influencing the Choice of Neurology as a Career among Medical Students ( $n=456$ ).

Select Neurology and Neurosurgery as Choices	Yes		Other Fields		Chi-Square Test	
	<i>n</i>	%	<i>n</i>	%	Statistic	P-value
Did you choose your specialty because of a secure job in that field?					3.21	0.073
No	89	32.20%	187	67.80%		
Yes	44	24.40%	136	75.60%		
Did you choose it because of feasible working hour conditions?					4.141	0.042
No	104	31.90%	222	68.10%		
Yes	29	22.30%	101	77.70%		
Did you choose it because you prefer to treat emergency case?					4.093	0.043
No	70	25.60%	203	74.40%		
Yes	63	34.40%	120	65.60%		
Did you choose it because you find prestige in working in that field?					6.466	0.011
No	12	16.70%	60	83.30%		
Yes	121	31.50%	263	68.50%		
Did you choose it because of a personal experience in that field that stimulated your interest (me/family member had a condition related to the specialty that stimulated my interest)?					0.127	0.721
No	54	28.30%	137	71.70%		
Yes	79	29.80%	186	70.20%		
Did you choose it because of a lack of physicians or surgeons of that specialty in the country?					0.068	0.794
No	96	28.80%	237	71.20%		
Yes	37	30.10%	86	69.90%		
Did you choose it because that specialty offers a variety of career workshops and courses?					0.027	0.87
No	66	28.80%	163	71.20%		
Yes	67	29.50%	160	70.50%		
Did you choose it because it provides options for fellowship training?					0.022	0.883
No	57	29.50%	136	70.50%		
Yes	76	28.90%	187	71.10%		
Did you choose it because you want a challenging specialty?					17.763	0
No	29	17.40%	138	82.60%		
Yes	104	36.00%	185	64.00%		
Did you choose it because you want to join in research and development in that specialty?					2.46	0.117
No	68	26.30%	191	73.70%		
Yes	65	33.00%	132	67.00%		

Did you choose it because of variety of patients with different conditions presenting in that field?					0.252	0.616
No	34	27.40%	90	72.60%		
Yes	99	29.80%	233	70.20%		
Did you choose it because your professor or mentor or teacher is in that field?					0.152	0.696
No	99	28.70%	246	71.30%		
Yes	34	30.60%	77	69.40%		
Did you choose it because of a learning or intellectual atmosphere in that field?					10.343	0.001
No	21	17.60%	98	82.40%		
Yes	112	33.20%	225	66.80%		
Did you choose it because your parents want you to choose that field?					4.68	0.031
No	112	31.60%	242	68.40%		
Yes	21	20.60%	81	79.40%		
Did you choose it because to be able to balance your work life with your family responsibilities?					14.456	0
No	89	36.80%	153	63.20%		
Yes	44	20.60%	170	79.40%		
Did you choose it because of the amount of education debt you have to clear as soon?					1.655	0.198
No	109	30.60%	247	69.40%		
Yes	24	24.00%	76	76.00%		
Did you choose it because you want to have long term relationship with your patients?					1.577	0.209
No	93	31.10%	206	68.90%		
Yes	40	25.50%	117	74.50%		
Did you choose it because of its content specialty?					1.161	0.281
No	29	25.20%	86	74.80%		
Yes	104	30.50%	237	69.50%		
Did you choose in order to acquire broad medical knowledge?					11.118	0.001
No	17	16.20%	88	83.80%		
Yes	116	33.00%	235	67.00%		
Did you choose it because you want to make a difference and a good treatment outcome in people's lives?					0.843	0.358
No	18	34.60%	34	65.40%		
Yes	115	28.50%	289	71.50%		

**Table 3:** Factor influencing the reluctance to choose neurology as a career among medical students (n=323).

Factors	n	%
You are reluctant to join neurology after graduation because of the difficult level of course?		
No	143	44.3
Yes	180	55.7
You are reluctant to join neurology because you found neurology to be difficult at under-grad level?		
No	166	51.4
Yes	157	48.6
You are reluctant to join neurology because of lack of resources?		
No	260	80.5
Yes	63	19.5
You are reluctant to join neurology because it is less popular among other physicians?		
No	203	62.8
Yes	120	37.2
You are reluctant to join neurology because it is difficult to get residency in it?		
No	184	57
Yes	139	43

## DISCUSSION

According to this study, 29.2% of all the students considered to pursue neurology as a career. Analyzing the factors as to why the students choose neurology revealed the primary reason was prestige involved in this field (90.9%). As a general impression, neurologists worldwide are highly respected for the commendable field they are associated with, as also unmasked by Albert et al. [2]. Students agreed on this to a major driving force, which motivates them to opt for neurology.

Our study strength included a significant proportion of medical students from the widely recognized medical colleges of Karachi opting for continuing medical education, which provides a validated database in future policymaking regarding graduate medical education.

The study also shows that the challenging nature of the field is another major reason why students choose neurology as a career (78.2%). This cultivates an intellectual environment for students (84.2%) and creates a healthy atmosphere for them to challenge their capabilities and further harvest their potential. In similar research conducted by Gupta et al., they found 'intellectual challenge' and 'logical reasoning' to be why 72% of students opted for neurology as a career [11]. Albert et al. also agreed that this specialty's intellectual content is one of the most important factors why a student decides to pursue a career in neurology, given that 90.2% of students agreed to this in their study. Another factor highlighted in their study was the desire to help people and make a difference in their lives [2], which is also seen in this study as 86.4% of students agreed for this to be a significant factor in choosing neurology.

Another factor affecting students' choice was the influence of a mentor from the field of neurology. 25.6% of students reported that their interest developed in neurology following the positive teaching patterns of a particular mentor who helped them form a firm basis of understanding regarding difficult neurological topics [11].

This study further highlighted that 70.8% of students did not want to pursue neurology as a career. Analyzing the factors responsible for this decision showed the course's difficulty to be the predominant reason (55.7%). The immensity of the subject text and incompetent teaching methods and an apparent void between the theoretical and practical knowledge and application of the subject culminate in students becoming distant with neurology. Various studies, including ones by Flanagan et al. [12]; Abdelrahman [1], found the causes as mentioned above to be the reasons why students developed lower confidence in neurology and termed it "neurophobia." Jozefowicz described neurophobia as 'the fear of neural sciences and clinical neurology that originates from the students' inability to apply their basic science knowledge to clinical practice leading to paralysis of thinking or action' [13]. This is considered to be a global issue faced by undergraduate medical students [14].

Similar studies focused on the type and quality of neurological teaching medical students receive on an undergraduate level to be the reason behind their neurophobia [1,15]. Eventually, this leads them on a path different from neurology, one where they are more comfortable in the field. Some studies have suggested that the intervention by technology-enhanced education and digital classrooms might help relieve students of this fear of Neurology [16] or develop a continuum of neurological education, incorporating active and observed learning throughout neurological education and enhancing socialization into neurology. Another study by Sheils et al. [17] found that methods of teaching such as Case-Based Learning, Team-Based Learning, and Problem Based Learning to be helpful in this regard [18], but more work has to be done to investigate further how we can take students out of this problem efficiently [1,19].

The failure to include colleges from other major cities of Pakistan, and not including other factors such as finance, social condition, lack of clinical neurology rotation, and too much emphasis on financially secure fields was a limitation in our analysis for this study.

The study elaborated the significance of factors involved in potentially choosing a career in neurology. The factors analysed by the higher medical educational authorities could in fact influence them to make policy changes on such career issues in order to disseminate and encourage medical students to potentially opt for neurology as a specialty career, thus possibly filling the needs of the deprived populations

## CONCLUSION

This article highlights the gap between the demand of neurologists and the number of students wanting to pursue neurology as a career. It offers an insight into the factors that are widening this problem and literature-based evidence as to how these problems could be overcome. The study confirms how difficult neurology is perceived to be. Therefore, more evidence-based interventions and teaching methods should be implemented to meet the increasing burden of neurological diseases, otherwise we would frighten off further generations, leading to a further deficit in the number of neurologists in the country.

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