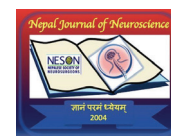









# Neurosurgery as a Career Choice among Recent Medical Graduates from the Institute of Medicine, Nepal: A Cross-sectional Study



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## Abstract

**Introduction:** The career choice of a medical graduate is often a complex process with multiple factors playing a part. Neurosurgery in Nepal is gradually growing and there is a huge interest in the academia to draw more graduates into neurosurgery. There is a paucity of data regarding the career choice of medical graduates from Nepal. The aim of this study was to determine the potential barriers and facilitators for choosing a future career as a neurosurgeon.

**Methods:** A descriptive cross-sectional study was carried out on all recent medical graduates in the last two weeks of their internship in 2021 from three medical colleges in Kathmandu. Variables included demographic characteristics, preferred specialty, willingness to choose neurosurgery and reasons for it, and the reasons for not choosing neurosurgery if done so. Frequency and percentages were used to describe the categorical variables. Mean and median were used to describe continuous variables. A comparison between two categorical variables (factors for choosing Neurosurgery as a career and factors that encouraged not to choose Neurosurgery) was made.

**Results:** Twenty-one out of 87 respondents preferred neurosurgery as their future career. The common motivating factors for choosing neurosurgery were innate interest in neurosurgery, motivation from seniors and mentors during clinical clerkship, and the glamour of the specialty. The main barriers were the perceived generally poor outcome of the neurosurgical patients, long hours of surgery, innate disinterestedness, long training and not having enough opportunities to get accredited training in the country.

**Conclusion:** Around Twenty-four percentage of graduates preferred neurosurgery as a future career. When the barriers are addressed there will probably be more medical graduates inclined to join Neurosurgery which will help in solving the shortage of neurosurgical manpower in Nepal.

**Key words:** career, education and training, medical graduates, neurosurgery

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## Introduction

Neurosurgery is one of the youngest surgical specialties that is evolving tremendously.<sup>1</sup> It is both resource- and time-intensive-field, and often requires a long period of training, anywhere between six to seven years after graduation from medical school depending upon the country of training.<sup>2</sup>

Nepal has a short history of availability of neurosurgery services. Although neurosurgery commenced back in 1962, dedicated neurosurgery service started only in 1989.<sup>3</sup> Even shorter is the recognized neurosurgery training which, though started in 1999, took momentum only in 2008.<sup>2</sup> As of 2019, 85 registered neurosurgeons were serving an estimated population of 28 million in Nepal.<sup>2</sup> This is lower than the recommended ratio of one neurosurgeon to a 1,00,000 population.<sup>4</sup> With an estimated number of 20-25 graduates per year, the predicted target is expected to be reached by 2030.<sup>2</sup>

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There are several studies evaluating the barriers and facilitators of choosing Neurosurgery as a future career in different countries.<sup>5-8</sup> However, no such study has yet been published addressing this issue in Nepal. Therefore, the primary objective of this study is to determine the proportion of recent medical graduates who wish to choose Neurosurgery as their future career from medical colleges directly under or affiliated with the Institute of Medicine (IOM) in the Kathmandu valley, Nepal. The secondary objective is to describe the perceived factors acting as barriers and facilitators of choosing Neurosurgery. The results of this study will have implications at the policy level in the country so that the neurosurgery workforce can be positively influenced.

### Methodology

A descriptive cross-sectional study was carried out using an online semi-structured, self-administered questionnaire. The study population included all recent medical graduates in the last two weeks of their internship in 2021. The study was carried out in three medical colleges of Nepal running under IOM in Kathmandu valley (Maharajgunj Medical Campus, Nepalese Army Institute of Health Sciences- College of Medicine, and KIST Medical College). Ethical approval was obtained from the Institutional Review Board of the IOM before the circulation of the questionnaire.

A five-part questionnaire was designed after reviewing the relevant literature and was validated. It included demographic characteristics, preferred specialty, willingness to choose neurosurgery and reasons for it, and the reasons for not choosing neurosurgery if done so. Each respondent was allowed to make multiple responses if applicable.

Email addresses were obtained from all the participating medical colleges and a survey link was sent to each of the email addresses individually. Participation in the survey was completely voluntary with informed consent duly taken. We provided two weeks for the respondents to fill in the questionnaire. The responses were collected via google forms anonymously with one email address allowed to register only once. The responses recorded from the google sheets were obtained in MS Excel worksheets.

For descriptive statistics, frequency and percentages were used to describe the categorical variables. Mean and median were used to describe continuous variables. A comparison between two categorical variables (factors for choosing Neurosurgery as a career and factors that encouraged not to choose Neurosurgery) was made using a Chi-squared test. A p-value of less than 0.05 was considered statistically significant.

## Result

Among 240 recent graduates, we received responses from 88. Eighty-seven consented to participate with a recruitment rate of 36.3%.

### Demographic Characteristics

The mean age of the respondents was 25.3 years (23-28 years). Fifty-four (62.0%) were males and 33 (38.0%) females. Eighty-three (95.4%) respondents were unmarried, two (2.3%) were married and two (2.3%) preferred not to disclose this information. Fifty-seven (65.5%) respondents were of urban origin.

### Specialty Preference

As shown in table 1, the most preferred specialty was Internal Medicine 24 (27.6%) followed by Neurosurgery 21 (24.1%).

*Table 1: Preferred specialty by respondents*

Specialty	Number (%)
Internal Medicine	24 (27.6%)
Neurosurgery	21 (24.1%)
Dermatology	7 (8.0%)
Orthopedics	4 (4.6%)
Cardiology	5 (5.7%)
Cardiothoracic Surgery, Pediatrics	3 (3.4%) each
Radiology, Ophthalmology, Neurology, Nephrology, General Practice, and Emergency Medicine,	2 (2.3%) each
Critical Care, Psychiatry, Otorhinolaryngology, Endocrinology, Urology, Anesthesia, Pulmonology, Nuclear Medicine, Obstetrics and Gynecology, General Surgery	1 (1.1%) each
<b>Total</b>	<b>87 (100%)</b>

### Willingness to Choose Neurosurgery

Twenty-one (24.1%) respondents were willing to pursue Neurosurgery as their future career. Among them, 16 (76.2 %) were males and 5 (23.8 %) females.

The common motivating factors for choosing neurosurgery were innate interest in neurosurgery, motivation from seniors and mentors during clinical clerkship, and the glamour of the specialty. Table 2 shows other reasons like family motivation, more research opportunities, and the love of a delicate specialty requiring attention to detail. Respondents were allowed to choose multiple options.

**Table 2:** Reasons for choosing neurosurgery as a future career

Reasons for choosing Neurosurgery	Number (%)
Innate interest in Neurosurgery	11(57.9%)
Inspiration/Motivation from seniors/mentors during clerkship	11 (57.9%)
Glamorous specialty	7 (36.8%)
Opportunity to earn more money	5 (26.3%)
Nepal has few Neurosurgeons and there is a prospect for fast career advancement	5 (26.3%)
To serve my country by providing neurosurgery services in rural parts of Nepal	4 (21.1%)
Other reasons	4 (21.1%)

#### Place of Origin and Choice of Neurosurgery

Our results showed that most graduates [16 (75.0%)] came from an urban background. However, the difference was not statistically significant ( $p=0.08$ ).

#### Willingness not to Choose Neurosurgery

As shown in table 3, poor patient outcomes and long hours of surgery were the main reasons for the reluctance to choose neurosurgery. The majority [ $n=40$  (60.6%)] chose more than one option for the disinclination to Neurosurgery. Only 26 chose only one from the multiple options.

**Table 3:** Factors for not choosing Neurosurgery

Factors for not choosing Neurosurgery	Number (%)
The patient outcome is generally poor	28 (32.2%)
Long hours of surgery	27 (31.0%)
I don't like it	22 (25.3%)
Long Training	18 (20.7%)
Not many opportunities to get accredited training in the country	12 (13.8%)

## Discussion

In this article, we attempted to determine medical graduates' career choices and find the factors which influence them to pursue a career in neurosurgery. Our study showed that respondents were inclined to go into medical specialties compared to surgical specialties. Among the surgical specialties, Neurosurgery was the most preferred. Factors such as innate interest, increased exposure to surgical specialties during the preclinical years, positive mentorship, research opportunities, and family wish affect our decisions in choosing a specialty.<sup>5,7,9,10,11</sup> Other factors that might come into play are opportunities to make more money and the scope of the specialty in the country.

24.13% of graduates were willing to choose neurosurgery. This is high compared to the study done by Balogun et al. among final year students in Nigeria, where only 7.8% of the respondents reported a willingness to choose neurosurgery as a career.<sup>5</sup> Reasons for an interest in Neurosurgery included intellectually stimulating work (94%), interest in neurosciences (93%), effect on patients (84%), innovation and new technology (80%), research opportunities (77%), and prestige (24%).<sup>8</sup>

Similarly, in a study done in the Philippines, out of 627 medical students who responded most had negative perceptions of Neurosurgery and only 18.7% were likely to pursue neurosurgery.<sup>12</sup>

In our study, the innate interest was the most common reason followed by motivation from neurosurgeons. To escalate interest in Neurosurgery among medical students' early exposure to surgery rotation, mentorship from neurosurgeons, and the creation of neurosurgical interest groups can play a vital role in choosing a career in it.<sup>5</sup>

In this study, patient outcomes and long hours of surgery have been the main reason for not choosing neurosurgery, which is consistent with the study done by Akhigbe et al.<sup>10</sup> They have observed that most students agreed that the neurosurgical illnesses had poor outcomes, the training period was too long, neurosurgical history was difficult to obtain, and neurosurgical signs were difficult to elicit.<sup>10</sup> Another study suggests preferred reasons for dissatisfaction with neurosurgical postings were unfriendly teaching environments, very early ward round and long duration of ward sessions, verbal intimidation from consultants and resident doctors, and pitiable conditions of patients including high mortalities.<sup>5</sup>

Studies have shown that gender discrimination and sexual harassment are seen mostly in surgical specialties.<sup>7</sup> Gender disparity is even more obvious with a disproportionately low number of female neurosurgeons all over the world. Globally, only 8.4% of the neurosurgery residents are females and in Nepal, only 5.8% of neurosurgeons are females.<sup>7,13</sup> In our study, only 5 (23.8%) female medical graduates among 21 were willing to be a neurosurgeon. This is similar to the findings by Balogun et al in Nigeria.<sup>5</sup> In a study done by Ashley et al., female medical students believe that there are invisible barriers to advance in neurosurgery. Societal and cultural boundaries, such as planning a family and gender roles also come into play when choosing Neurosurgery for females.<sup>14</sup> If proper measures are taken to break these barriers, we can expect more participation from female medical students in neurosurgery.

As stated by Bonney et al. the goal of the recruitment strategy for the institution and country where there is less than the required number of neurosurgeons, is to encourage competitive, highly motivated students to join the field.<sup>15</sup>

## Limitations

There are a few limitations of this study. The less than expected response rate and this study being from three medical colleges in Kathmandu may not reflect the overall view of all medical graduates from the country.

## Conclusions

This is the first study from Nepal looking at the specialty preference of recent medical graduates. Though more than 20% of graduates preferred neurosurgery, more needs to be done both at the individual and institute levels to attract medical graduates to come to this important field.

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