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## SHORT REPORT

## Neurosurgery training in Pakistan: Follow-up survey and critical analysis of National Training Programmes

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### Abstract

This cross-sectional nation-wide survey was planned to assess the current status of neurosurgery residency training in Pakistan and to compare it with the results of a previous study. The duration of study was from July to December 2015. It comprised of neurosurgery trainees enrolled with the College of Physicians and Surgeons of Pakistan (CPSP). In this study, 43 trainees from 13 centres were included. The mean duration of training acquired by participants was  $2.8 \pm 1.9$  years. The mean work hours were  $73.8 \pm 21.9$  per week. Moreover, 28(65%) trainees had access to at least one neurosurgery journal while 29(67%) did not have any indexed publication. Besides, 2(15.4%) centres did not have internet facility and more than half did not have a regular morbidity and mortality meeting. Training facilities were highly variable in different institutes. When compared with previous study, little improvement occurred during the previous six years. We recommend a uniform academic curriculum and standardisation of training facilities among different institutes.

**Keywords:** Neurosurgery, Training programmes, Pakistan.

### Introduction

Neurosurgery is a demanding specialty that requires rigorous training.<sup>1</sup> The quality of a training programme depends on the available mentorship, infrastructure and training facilities. In more developed countries, most institutes are willing to invest in the facilities for cadaveric dissection, skill labs and simulation technology to refine the skills of trainees, whereas the developing countries are still lacking in basic infrastructure.<sup>2</sup>

Sustaining good standards in neurosurgical training has been a subject of discussion in Pakistan.<sup>3</sup> A senior author conducted a nationwide cross-sectional study in 2010 exploring the state of neurosurgical training in Pakistan.<sup>2</sup>

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Several deficiencies in the existing system of training were identified. The findings were discussed at neurosurgical forums and were also published in the hope that recognition of the problem will stimulate improvement.<sup>2</sup> The current study was planned to assess the change in state of neurosurgical training in Pakistan; it was a follow-up survey of neurosurgery trainees from various training institutes.

### Methods and Results

This cross-sectional, nation-wide survey comprised of neurosurgery trainees belonging to neurosurgery institutes accredited with the College of Physicians and Surgeons Pakistan (CPSP). This study was conducted over a period of six months from July to December 2015 at the Aga Khan University Hospital Karachi, POF Wah Cantt Hospital, Wah and Jinnah Dental and Medical College, Karachi. Approval was obtained from the ethics review committee (ERC) and consent was obtained from all participants who were asked about demographics, details of basic medical and residency training, number of trainees and trainers in the centre, frequency of academic and teaching sessions, research work and related facilities.

Overall, 13 major neurosurgery institutes from all the four provinces, with established training programmes, were selected and 50 trainees were contacted via email. Two reminder emails were sent one week apart to the non-respondents. Identities of respondents were kept confidential and only the principle investigator and co-investigators collecting the data had access to it. Those trainees who did not fill the consent form or who sent incomplete forms were excluded.

Statistical analysis was performed using SPSS 21. Continuous data was presented as means and standard deviation, or median and range. Categorical data was presented as frequency and proportion.

Of the 50 trainees, 43(86%) participated in this survey. Of them, 39(90.69%) trainees were male and 4(9.3%) were female. The overall mean age was  $31.9 \pm 3.5$  years. The mean duration of training acquired by respondents at the time of survey was  $2.8 \pm 1.9$  years. Moreover, 8(18.6%) respondents had switched training programmes and

**Table:** Comparison of factors surveyed in current and previous study.<sup>2</sup>

Factors	Current Study	Previous Study <sup>2</sup>
Respondents	43	36
Number of training centres	13	11
Mean Age	31.9 ± 3.5 years	31 years
Mean duration of training	2.8 ± 1.9 years	3.8 years
Mean working hours per week	73.8 ± 21.9 hours	Not studied
No internet facility	13% centres	40% centres
Most frequently consulted textbook	Greenberg's Handbook of Neurosurgery	Youman's Textbook of Neurosurgery
Trainees who had never published	67% (n = 29)	85% (n = 31)
Trainees who had never presented a paper	67% (n = 29)	65% (n = 23)
No basic science teaching session	54% (n = 7 centres)	30% (n = 3 centres)
No morbidity & mortality meetings	54% (n = 7 centres)	30% (n = 3 centres)
No journal clubs	38.5% (n = 5 centres)	40% (n = 4 centres)
No neuro-radiology meeting	38.5% (n = 5 centres)	20% (n = 2 centres)
No neuro-pathology meeting	69.3% (n = 9 centres)	40% (n = 4 centres)

therefore had training at more than one centre.

The reported mean working hours per week were 73.8±21.9 hours, whereas the median time spent was 77 hours (range: 40-120 hours) per week. The reported mean time spent in operation theatre per week by trainees was 22.8±11 hours with a median time of 20 (range: 3-50) hours per week. Besides, 33(76.74%) trainees had conducted teaching sessions for junior trainees while 12(28%) had conducted teaching sessions for nurses.

Of the 13 centres, 2(15.4%) did not have internet facility. Moreover, 29(67%) respondents reported not having any publications in indexed journals and 39(90.7%) respondents had never presented a paper in a national and international scientific meeting. Also, 28(65%) respondents had access to atleast one neurosurgery journal; however, 20(46.5%) participants had access to any indexed neurosurgery journal. In addition, 9(21%) respondents were members of a national or international neurosurgery society, the most common society being the American Association of Neurosurgery with 5(11.6%) members. The most common reasons cited for no membership were financial constraints and lack of awareness.

Besides, 20(46.5%) participants had more than one neurosurgery textbook in their department. Also, 28(65%) trainees reported Greenberg's Handbook of Neurosurgery as their most preferred reference guide.

There was no uniformity in academic sessions held at different training centres even though scheduled academic sessions were being conducted in 12(92.3%) centres. Furthermore, 7(54%) centres had no regularly scheduled morbidity and mortality meeting, whereas

5(38.5%) centres each had no journal club and neuro-radiology meetings. Cadaveric dissections were not part of training at any centre (Table).

## Conclusion

The paper published in 2010<sup>2</sup> identified several encouraging aspects of the existing nationwide neurosurgery training system, but at the same time also clearly highlighted significant problems with it, most of which were correctable, despite resource restraints. The paper also mentioned the need for periodical surveys of similar nature in order to assess the trends in improvement. The current study was aimed to re-survey few of the major neurosurgery training centres for this purpose (Table).

The number of respondents at 43 in our study was higher as compared to the previous study<sup>2</sup> (n=36). Male predominance, mean age and mean time duration of training at the time of survey were similar in the two studies.<sup>2</sup>

We found that 15% training centres comprised 18% respondents, but still they did not have internet facility, which was an improvement from the last survey in which 40% respondents reported not having internet available. A surprising finding was the lack of indexed publications, as 67% respondents reported not having any so far in their careers. This may be unusual for most developed countries where research interest is developed during medical school. In developing countries such as India, research interest among trainees in neurosurgical centres remains low<sup>4,5</sup> though there are exceptions to the rule.<sup>5</sup> Sixty seven percent trainees had not presented at either national or international conference. These results are nearly the same as in the previous survey.<sup>2</sup> Considering that lack of research experience is a major hindrance in clinical and technological advancement of young neurosurgeons, and thus their development as an academic surgeon,<sup>6</sup> this dearth of pursuing research in the academic institutions of Pakistan is surely alarming.<sup>7</sup>

The number of academic sessions at most centres was also inadequate. Half of the training centres still did not have regular morbidity and mortality meetings which are not just important for clinical appraisal and improving quality of care, but are now considered essential, especially for high stakes specialty training programmes.<sup>8</sup> It was encouraging to note that around two-thirds of the institutions had regularly scheduled neuro-radiology sessions and half had regular journal clubs. However, only a quarter had regular neuro-pathology meetings. Sixty percent of respondents in the last survey attended regular neuro-pathology meetings and journal clubs, while 80%

attended neuro-radiology sessions.<sup>2</sup>

We once again found the absence of facilities for cadaveric dissections at all training centres. Recent studies have highlighted the importance of a curriculum for cadaveric dissection for standardisation of neurosurgical training among different programmes and as a means of skill assessment in surgical trainees.<sup>9</sup> Similarly, none of the training programmes offered exchange programmes or external rotations for trainees, which are important for uniform competency of graduating residents.<sup>10</sup> This was also one of the recommendations of the previous survey.

This survey did not include trainees enrolled in training programmes not accredited with the CPSP which make up only a small fraction of national neurosurgery trainees.

The follow-up survey identifies several limitations in the current neurosurgery training in Pakistan. Over the past 6 years some improvement has been seen. There is a need to promote research culture, morbidity and mortality meetings, journal clubs and cadaveric dissection courses. Exchange programmes with national and international institutes can also improve neurosurgery training.

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