

What it is to be a Woman Neurosurgeon in India: A Survey

Abstract

Background: Around the world, measures are being undertaken to increase the number of women in the field of neurosurgery, by improving their working conditions and developing a supportive system. This survey was conducted to assess the status of women neurosurgeons in India.

Aims and Objectives: To assess the barriers, supportive system and professional/personal satisfaction of Indian women neurosurgeons. **Materials and Methods:** A survey questionnaire containing 19 questions was designed. The number of women neurosurgeons in India was found to be 73 as of September 2017. An anonymous Google survey was undertaken by sending the survey questionnaire through email to 69 female neurosurgeons in the month of September 2017, and the email ids of 4 neurosurgeons were not available. 55 out of 69 replied to the survey questionnaire (79.7%) in a time period of 4 weeks. Results were collected and analyzed. **Results:** Our survey showed that 34.54% of Indian women neurosurgeons were being residents and 65.45% being younger than 40 years of age. Majority of them (92.72%) joined neurosurgery with passion and only 30.9% had a medical professional who kindled the interest in neurosurgery. 72.68% were discouraged before joining into neurosurgical residency. 74.4% reported to receive good to excellent support from the parent department. Only 40% had another female colleague in the department and they received good to excellent support from the female colleagues. Though 74.5% received good support from male colleagues the excellent support remained low. 40% reported to face discrimination by gender. 74.5% are married and 96.4% reported to receive good to excellent support from the family members. 80% face difficulty in balancing career and personal life. 70.9% have satisfaction in professional life and 69% lead a satisfactory personal life. 67.3% of female neurosurgeons felt that formation of an exclusive women neurosurgeons' forum would benefit them. **Conclusion:** In India there is a positive trend in female physicians taking up neurosurgery. The present residency program in our country is supportive to women in majority. However active measures should be taken to encourage female physicians to take up neurosurgery, reduce the existing gender discrimination and improve the supportive system especially during pregnancy and child rearing.

Keywords: Gender, neurosurgery, women

Introduction

There is a great shortage of neurosurgeons for the growing population around the world, especially in developing countries like India. More neurosurgeons are required to treat neurosurgical disorders, and female surgeons joining the force are only a boon. The role of female physicians in the field of neurosurgery is greatly emphasized in many countries. In India, there are < 2.5% of female neurosurgeons who offer the service. There are multiple reasons for female doctors not preferring the field of neurosurgery. Misconception that neurosurgery is not the field for females among the family members, medical professionals and the female doctors themselves, fear of compromise on family

life, need for greater family support for childcare, fear of gender discrimination, physical demands and less number of female neurosurgeons, act as barriers, in addition to the challenges faced by both sex in the neurosurgical field. Are these still hold true in the present decade? How do the successful female neurosurgeons feel? To get the answer, we conducted a survey among the present female doctors enrolled in neurosurgery in India. The survey results could throw a light on the present situation of female neurosurgeons in India, and that could help in formulating the future strategic plans.

Materials and Methods

In 2016, women neurosurgeons' forum was formed under the age is of the Neurological Society of India and a member directory was maintained. By contacting the male

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Survey Questionnaire on Status of Women Neurosurgeons in India

<p>1. Designation Director / HOD Assistant Professor Consultant Resident Retired</p> <p>2. Age (In Numbers)</p> <p>3. How did you join neurosurgery with Special interest No special interest Not interested, I did not have any other option other than NS</p> <p>4. Who kindled the interest in neurosurgery? Medical professional Own interest Friends / family All of the above</p> <p>5. Discouragements encountered for joining neurosurgery Yes, from Neurosurgeon Yes, from non neurosurgical medical professional Yes, from family member All of the above No</p>	<p>6. Support from the parent department during the neurosurgery residency Excellent Good Poor Nil</p> <p>7. Do you feel that you are discriminated from male colleagues? Yes No Maybe</p> <p>8. Support from the female neurosurgery colleague/s in the department Excellent Good Poor Nil No Female Colleague</p> <p>9. Support from the male neurosurgery colleague/s in the department Excellent Good Poor Nil</p> <p>10. With whom do you feel comfortable working with? Male colleagues Female colleagues No preference</p>
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Figure 1: The first 10 questions

<p>11. Was there any neurosurgical resident in your department who left the course since he/she was unable to cope up with the training? Male colleague Female colleague None</p> <p>12. Marital status Married Single Divorced</p> <p>13. Number of children (In number)</p> <p>14. Support from your family Excellent Good Poor Nil</p> <p>15. Difficulty in balancing your career with the personal life No difficulty Minimal Moderate Severe</p>	<p>16. Are you satisfied with your professional life Yes No Maybe</p> <p>17. Are you satisfied with your personal life? Yes No Maybe</p> <p>18. What do you feel - Formation of an organization for women neurosurgeons will benefit us Yes No May be</p> <p>19. How are you benefited from WINS? Academic support Collaboration and collegiality with other women neurosurgeons Moral boost All of the above Nothing special</p> <p>20. Any remarks you wish to write</p>
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Figure 2: The last 9 questions and the remarks of the participants

and female colleagues, through Google search and NSI database, the number was found to be 73 as of September 2017. This included the residents in training, those who were certified and practicing in India and also those who are practicing outside our country after being certified from India. The e-mail addresses of four neurosurgeons were not available. An anonymous Google survey containing 19 questions was designed [Figures 1 and 2]. The questions have been formulated to identify the supportive system, gender discrimination, family life, and satisfaction rate in professional and personal life. These questions have been derived from the personal experience of the authors and the previous survey done among female neurosurgeons from Japan. The survey questionnaire was sent through e-mail

to 69 female neurosurgeons in September 2017. 55 out of 69 replied to the survey questionnaire (79.7%) in 4 weeks. Results were collected and analyzed.

Results

There were five senior female neurosurgeons between the ages of 51–90 years (9.09%). The first Asian female neurosurgeon Prof. Kanaka was aged 85 years at the time of survey. From 31 to 50 years, there were 37 (67.27%) and between 21 and 30 years, there were 10 (18.18%) [Figure 3]. 3 respondents (5.64%) did not mention their age. 19 residents (34.54%), 19 consultants (34.54%), 7 Assistant Professors (12.7%), 9 Directors/HOD (16.3%), and 1 (1.8%) were the respondents to the survey. About 94.4%

joined neurosurgery since they had a passion for it and only 3 (5.6%) joined without any special interest in this field. No one has joined with a dislike to this field [Figure 4]. The interest in neurosurgery was kindled by medical professionals in 17 (30.9%), friends and family in 2 (3.6%),

and self-motivation by 31 (56.4%). All of this played a role in 4 (7.2%). 40 (72.68%) faced discouragement to join into neurosurgery, from neurosurgeons (29.1%), from other medical professionals (21.8%), from family (3.6%), and from all (18.18%). One participant did not reply to this survey question.

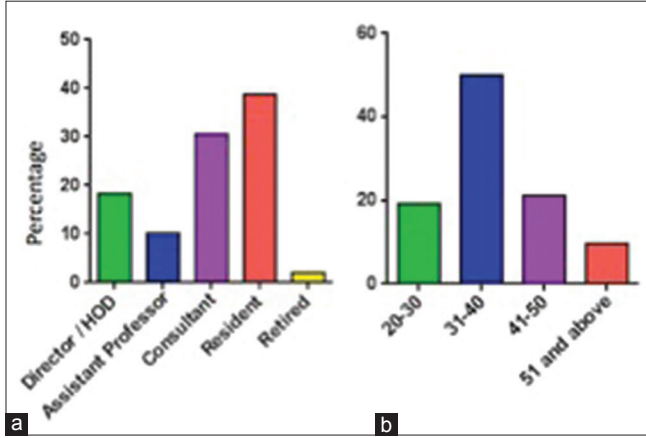


Figure 3: Graph showing the designation (a) and age (b) of female neurosurgeons in India in percentage with 34.54% being residents and 65.45% being younger than 40 years of age

After joining into neurosurgery 41 (74.4%) reported that they receive/d good (36.3%) to excellent (38.1%) support from the parent department during the residency period [Figure 3]. Poor support was reported by 11 (20%) and nil support by 2 (3.6%). One participant did not reply to this survey question. Regarding gender discrimination, 19 (34.54%) did not face any, but 22 (40%) reported to face gender discrimination [Figure 5]. 14 (25.45%) were not sure whether they faced any discrimination by gender. Only 21 (38.18%) of the participants had another female colleague in their department. Among them, 8 (38%) received excellent and another 8 (38%) received good support from their female colleagues. Poor and nil support were reported by 5 (24%). 33 (60%) had no female colleagues. One participant did not reply to this e-mail. Regarding the support from male colleagues,

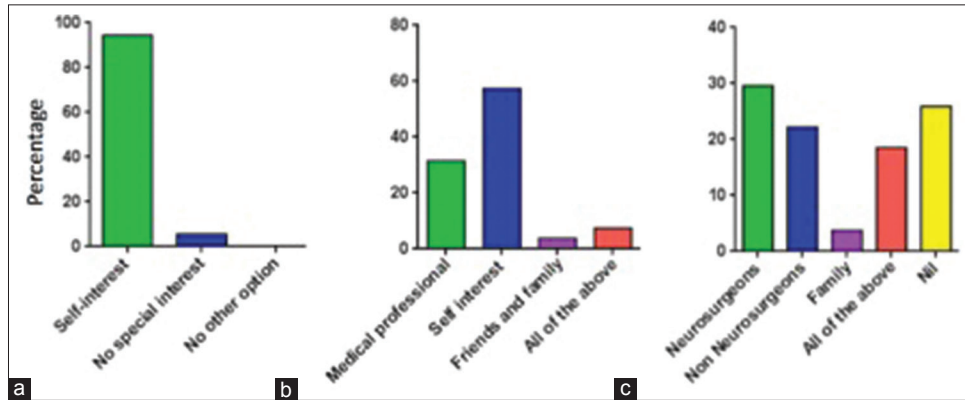


Figure 4: Graphs showing that 92.72% of female neurosurgeons joined neurosurgery with passion (a), only 30.9% had a medical professional who kindled the interest in neurosurgery (b) and 72.68% were discouraged before joining into neurosurgical residency (c)

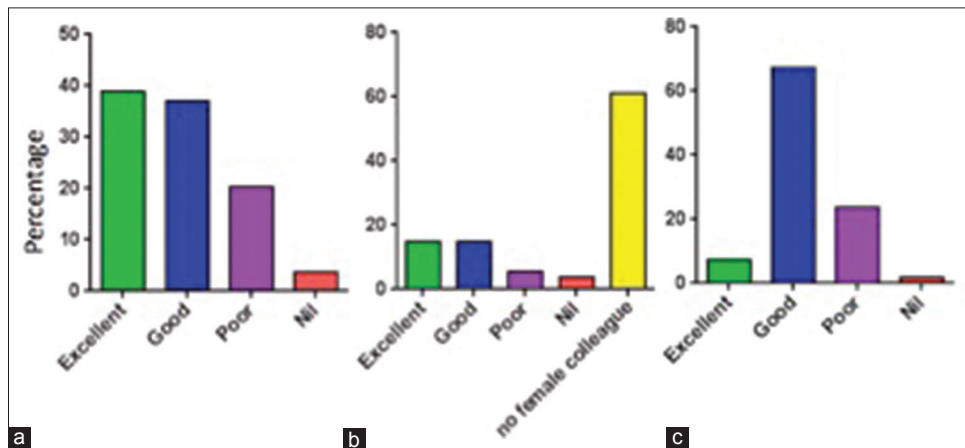


Figure 5: Graphs showing the support the female neurosurgeons received during the residency. (a) 74.4% reported to receive good-to-excellent support from the parent department. (b) Only 40% had another female colleague in the department, and among the 40%, 76% received good-to-excellent support from the female colleagues. (c) Though 74.5% received support from male colleagues the excellent support remained low

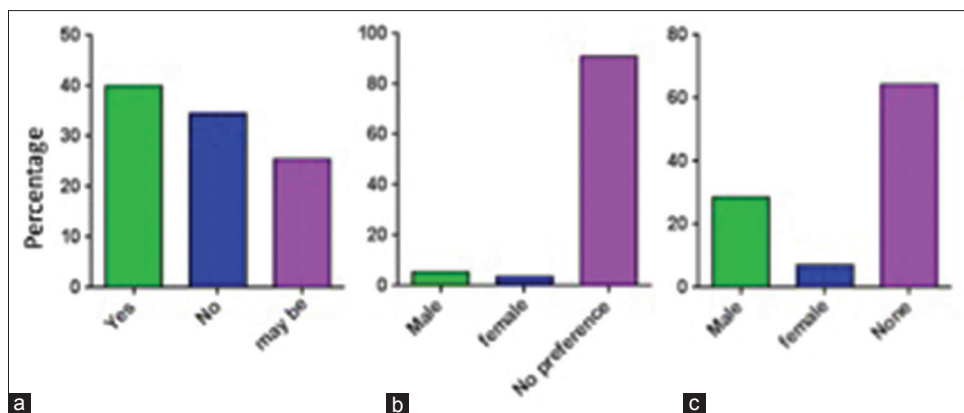


Figure 6: Graphs showing the percentage of perception of gender discrimination by female neurosurgeons, comfort working with male colleagues and attrition rate. (a) 40% reported to face discrimination. (b) 90.9% reported to feel comfortable working with both female and male colleagues. (c) Attrition rate among male residents seems to be higher than the female residents

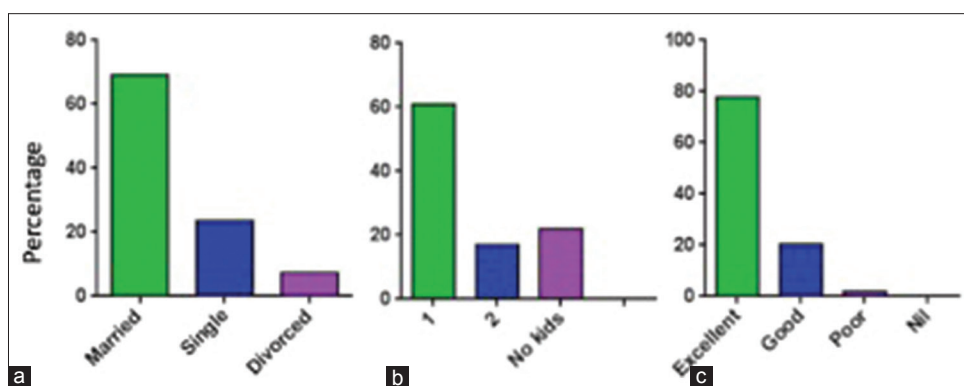


Figure 7: Graphs showing the family life of female neurosurgeons. 74.5% are married (a) and among them 78% have children (b). 96.4% reported to receive good-to-excellent support from the family members (c)

4 (7.3%) reported excellent and 37 (67.2%) reported good support. Poor to no support was reported by 14 (25.5%). About 90.9% of the participants reported to be comfortable working with either sex in their department and 2 (3.6%) reported preference to work with female colleague and 3 (5.5%) with male colleagues [Figure 6]. To the question regarding the attrition during residency, 16 male colleagues and 4 female colleagues were reported to leave the residency since they were unable to cope up with the neurosurgical training.

41 (74.5%) were married with 3 (5.5%) divorced and among them 32 (78%) had children on average of 0.95 (25 had 1 child and 7 had 2 children) [Figure 7]. 96.4% reported to receive good (20%) to excellent (76.3%) support from their family members. Only one reported to receive poor support from family and one did not reply to the survey question. 39 (70.9%) reported to be satisfied with their professional life and 5 (9.1%) were not satisfied. 11 (19.8%) could not comment whether they were satisfied or not (may be) [Figure 8]. 38 (69%) reported to have satisfaction with their personal life, 9.1% were not satisfied and 12 (21.8%) could not comment (may be). Except 11 (20%) all the others reported difficulty in balancing their professional and personal life. Minimal difficulty by

20 (36.4%), moderate difficulty by 21 (38.2%), and severe difficulty by 3 (5.5%) was reported.

37 (67.3%) felt that an exclusive women neurosurgeons' forum will be beneficial and almost 89.09% felt that they were benefitted by the recently formed social media group for female neurosurgeons [Figure 9].

Discussion

Benzil *et al.*^[1] assessed the growing scarcity of neurosurgical workforce in the USA and Williams *et al.*^[2] estimated the shortfall of neurosurgeons in the USA alone to be 6% by the year 2030. This is largely applicable to a developing country like India. There were approximately 2500 certified neurosurgeons in India at the time of survey, and approximately there is one neurosurgeon per 0.43 million population in India (World Bank, United States Census Bureau 2016). This ratio is going to get worse in the coming decades because the recruitment of residents per year is not kept in pace with the growing population.

It is vital to encourage enrollment of women for the future success of our field. There were 73 female neurosurgeons in our country as of September 2017, including the residents, which constituted around 2.5% of total neurosurgeons in

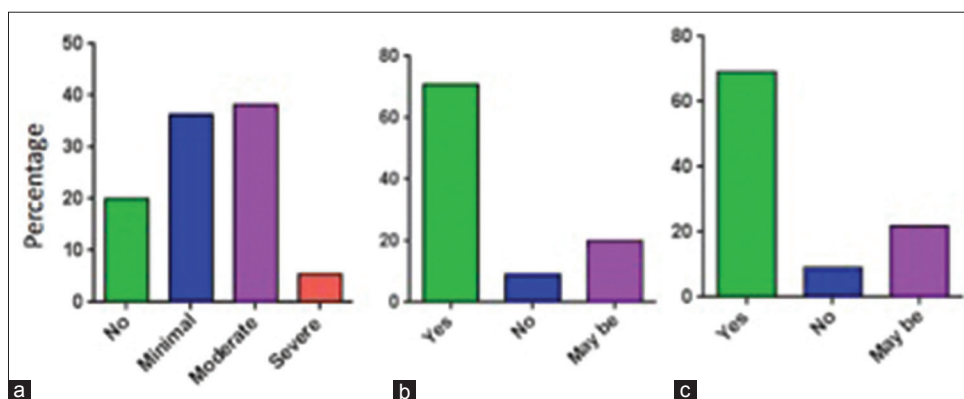


Figure 8: Graphs show that 80% face difficulty in balancing career and personal life (a), 70.9% have satisfaction in professional life (b) and 69% lead a satisfactory personal life (c)

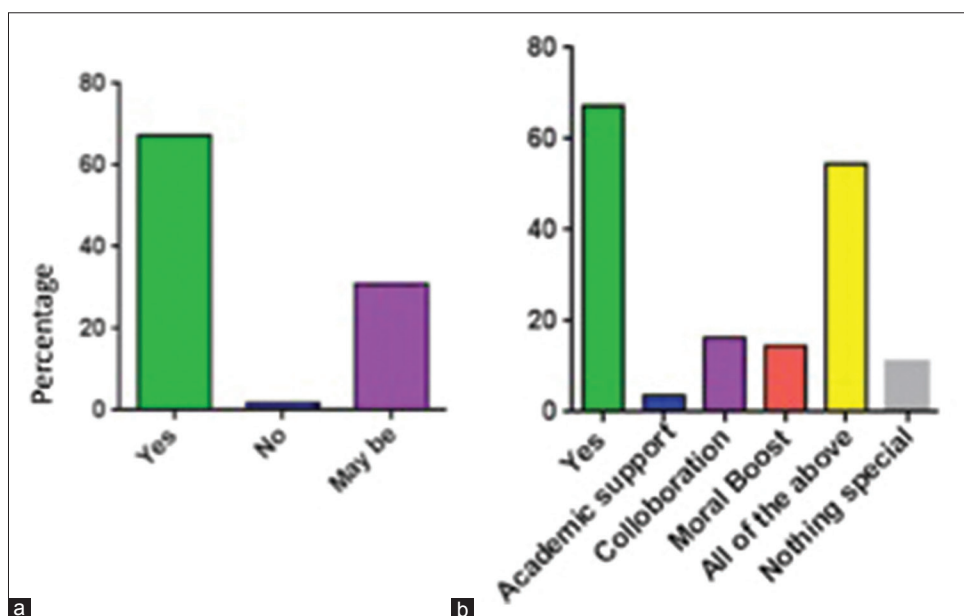


Figure 9: Graphs show that 67.3% of female neurosurgeons felt that formation of an exclusive women neurosurgeons' forum will benefit the women (a) and 89.09% felt benefited by the existing exclusive social media group for female neurosurgeons (b)

India. This is very less compared to the board certified women neurosurgeons from Europe – 12%,^[3] Britain and Ireland – 8%,^[4] USA – 7%,^[5,6] and Japan – 5.6%.^[7] The first Asian woman neurosurgeon who is 85-year-old (at the time of the survey), Prof. Kanaka, is from Tamil Nadu, India. She graduated in the year 1968 from Madras Medical College, Tamil Nadu. After her, till 1980, there were two women neurosurgeons graduated from India. From 1981 to 2000, 13 women and from 2001 to 2010 around 24 women entered into neurosurgical residency. From 2011 to September 2017, around 33 residents were recruited into neurosurgery. Although there has been a change in the trend of women preferring to join neurosurgery in recent decades, it is still low.

In India, neurosurgery is a challenging field for either sex because of large population and the number of patients one has to see, recruitment of residents is not on par with growing population, long working hours without any

restriction of duty hours, and long duration of residency with meager stipend. In addition, women face other challenges. The stigma of neurosurgery not being the field for women is still prevalent not only among the men but also among women physicians. The custom of marriage being arranged by parents is widely prevalent in India. Women neurosurgeons are not preferred by many men thinking that they could not spare time for the family since the entire family care, especially childcare is considered to be the responsibility of a woman. Even after overcoming these barriers once they join, they are afraid of gender discrimination, lack of supportive system with less number of female colleagues, and high possibility for compromised personal life. However, there is no survey or study done till now to identify the exact barriers and its intensity. We thought that the experiences of the present women neurosurgeons should give some insight to the current situation of women in the neurosurgical field in India. We

conducted a survey in September 2017, and we got 79.7% response. The survey showed interesting results.

Majority (92.7%) of the survey participants joined neurosurgery with great passion though majority of them (72.68%) faced discouragement for joining. For a challenging field like neurosurgery, passion is an important quality, especially for a woman, to survive the hardships of neurosurgical residency. This passion for the field could reduce the attrition rate during the residency. This survey shows the demand for high passion to become a neurosurgeon.

In general, in India, as we stated previously, women are discouraged to take up surgical field, especially neurosurgery by their family members due to the social issues. Our survey showed that 29.1% were discouraged by neurosurgeons and 21.8% by other medical professionals and only 30.9% of medical professionals were instrumental in kindling interest. Discouragement and demotivation faced from a neurosurgeon is expected to have a more negative impact on decision-making process of a medical student, more than the family members. The excellence of female surgeons in showing similar surgical outcome and more efficiency in basic surgical skills and theoretical knowledge, as compared to male colleagues is reported by Wallis *et al.*^[8] and Lou *et al.*^[9] In India, women constitute around 50% in medical schools.^[10] When neurosurgery requires bright students, and when it is preferred by only few of the brightest students, it is paramount that the interested female physicians should be encouraged to join neurosurgery, and they should not be discouraged based on the gender by medical professionals.

Our survey showed that the present institutes and hospitals in India, which offer neurosurgical residency program, give good support to women neurosurgeons. This seems to be encouraging for the female doctors to join neurosurgical field in our country. However, 40% reported to face discrimination by gender that needs to be addressed. As stated by AANS,^[11] "Fairness and equality are fundamentally right and vital to the future success of our evolving specialty." The existence of gender inequity and female underrepresentation in neurosurgery is reported in the USA^[1] and Great Britain and Ireland.^[4] WINS white paper^[12] recommended eliminating discriminatory practices in the recruitment of medical students, in the training of residents, and the hiring and advancement of neurosurgeons. In India, for the past few years, candidate selection in most of the institutes is based on the rank scored during the entrance examination, without conductance of the interviews, which is a good initiative to avoid gender discrimination in the selection process. It should be implemented to every neurosurgical institute in India. During residency, the head of the department should make sure that discrimination by gender is not practiced by anyone in the department on the allocation of duties,

rotations in units, number of surgical opportunities one is exposed, etc., It should be made mandatory to educate the female residents at the time of joining about the maternity leave benefits. In Japan, they have a gender equality committee of neurosurgical society. Forming a Gender Equality committee in India is advisable.

In our survey, more than 96.3% received good (20%) to excellent (76.3%) support from their family members; however, 74.6% found minimal-to-moderate difficulty in balancing their career with personal life. Family support remains one of the main determinants of successful career for female neurosurgeons in India. In our country, supportive systems are not available for childcare when compared to developed countries, and family support is very much required. In Japan, 45.4% of the female neurosurgeons had their children taken care by the licensed nurseries, 12.5% by babysitters and night childcare and sick childcare were available for 21% and 18%, respectively.^[7] In India, there is no such system available and the childcare is the sole responsibility of the mother, spouse, or the grandparents. If family support is not available, then a female surgeon is forced to temporarily discontinue her career and rejoin later which acts as a setback. Hence, the development of supportive system is the need of the hour to ensure their full participation.

Our survey breaks the common belief of female neurosurgeons not having a satisfactory family and personal life. Our survey showed that majority (75%) were married, 78% having child (ren) on an average of 0.95 with a satisfactory rate of 71% and 69% for professional and personal lives, respectively. This is better than the status of the Japanese women neurosurgeons, where 50.4% of women neurosurgeons^[7] were married and only 39.4% have child (ren).

Females are found to be more supportive to another female in their department than male colleagues as per our survey (38% vs. 7.3% excellent support from female and male colleagues, respectively). For men, their dominance in number unknowingly forms a supportive group in every institute, and they are helped by each other in every aspect. Only 40% of the respondents in our survey had other women in the department and that too less in number. Around 60% are entirely dependent on their male colleagues and faculties in the department for any moral or academic support. Hence it is important to form a national women's forum, which could lend its help to other women, especially residents and young neurosurgeons. In our survey, 67.3% supported for the formation of such an exclusive women's forum and 89.09% felt benefitted by the existing exclusive social media group for women neurosurgeons in India. At the same time, 23.5% reported poor or nil support received from another female colleague, which is worrying. It is time to rethink about how helpful one woman can be to another.

Limitations of the survey

There is a possibility that our survey results could be influenced by the traditional perception and expectation on females in a conservative country like India in performing their professional duties, commitment to their family and ability to find work-life balance. Although our survey was able to enlighten the possible causes for lower recruitment of women into neurosurgery in India, the exact barriers and their intensity can be identified only if the survey is performed among female medical doctors. Our survey included only women neurosurgeons who were practicing neurosurgery or pursuing residency. This did not include those who quit the neurosurgical residency, and their experience will throw a better light on the existence of gender discrimination and supportive systems in India. This survey could not predict on the attrition rate accurately since we could not collect the exact data of how many women quit their residency since 1968.

Recommendations

1. Neurosurgical society should realize the growing scarcity of neurosurgeons per population and the need for the vital role of women as a formidable force for the success of neurosurgery. Active measures should be taken to increase their number in our field
2. Medical professionals especially neurosurgeons should motivate women physicians to take up neurosurgery
3. Action against gender discrimination should be taken if possible by forming the gender equity committee
4. Though most of the female neurosurgeons are satisfied with their personal and professional life, family support still remains a strong determinant for the success of career. Hence, supportive systems should be developed
5. Exclusive women neurosurgeons' forum could lend a great support to other women, especially residents and young neurosurgeons and its activities should be expanded.

Conclusion

In India, there is a positive trend in female physicians taking up neurosurgery. The present residency program in our country is supportive to women in majority. Our survey results break the common belief that female neurosurgeons do not generally cherish a satisfied personal life. However, active measures should be taken to encourage female physicians to take up neurosurgery, reduce the existing gender discrimination, and improve the supportive system for women, especially during pregnancy and child-rearing. The activity of women neurosurgeon's forum should be expanded and should be independent.

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Conflicts of interest

There are no conflicts of interest.

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