

Women in Neurosurgery (WIN): Barriers to Progress, World WIN Directory and the Way Forward

Abstract

Women in Neurosurgery (WIN) have come a long way and are making inroads in every neurosurgical subspecialty. There has been a worldwide increase in the number of female neurosurgeons both in the training and practice. Although this is a welcome trend, gender equality at work in terms of opportunities, promotions, and pay scales are yet to be attained. This is more apparent in the developing and underdeveloped nations. Barriers for a female neurosurgeon exist in every phase before entering residency, during training, and at workplace. In the neurosurgical specialty, only a few women are in chief academic and leadership positions, and this situation needs to improve. WIN should be motivated to pursue fellowships, sub-specialty training, research, and academic activities. Furthermore, men should come forward to mentor women, only then the gender debates will disappear and true excellence in neurosurgery can be attained. This article reviews the issues that are relevant in the present era focusing on the barriers faced by female neurosurgeons in the developing and underdeveloped countries and the possible solutions to achieve gender equality in neurosurgery. The authors also present the data from the World WIN Directory collected as a part of Asian Congress of Neurological Surgeons-WINS project 2019. These numbers are expected to grow as the WIN progress and add value to the neurosurgical community at large.

Keywords: Barriers, female neurosurgeons, gender equality, leadership, mentoring, work-life balance, world WIN directory

Introduction

Women in Neurosurgery (WIN) – the clan only keeps growing each passing year and we have witnessed good progress in the past decade with the number of female neurosurgeons and residents increasing in every part of the world. We have more women pursuing the neurosurgical subspecialties and excelling in it. There is an increasing awareness among men in neurosurgery that more women are taking up neurosurgery as career choice like never before and it also translates to improved professional relationships at workplace. Women are more vocal about the problems faced by them and women-centric organizations are growing worldwide. It is also predicted that by 2065, 50% of neurosurgical residents will be females and true gender equity in neurosurgery may be achieved.^[1] Despite the positive trends and increase in numbers, gender inequality in neurosurgery does remain a major issue today and continue to be

so in the next few decades. The authors reviewed the issues that are relevant in the present era with a focus on the WIN in underdeveloped and developing countries and also present the world data on WIN collected by the Asian Congress of Neurological Surgeons (ACNS) as a part of its project in 2019.

Discussion

Analysis of the barriers and solutions

A review of literature revealed that female neurosurgeons worldwide faced certain common barriers both visible and invisible and it did not greatly differ in the various parts of the world regardless of developed, developing or underdeveloped countries. These were only more pronounced in the lesser developed nations and consequently reflected on the low numbers of female neurosurgeons in that part of the world. These barriers are discussed below in three stages.

Sneha Chitra Balasubramanian, Dhivya Palanisamy¹, Souad Bakhti², Najia El Abbadi³, Nelci Zanon Collange⁴, Claire Karekezi⁵, Boon Seng Liew⁶, Yoko Kato⁷

Department of Neurosurgery, Sri Ramachandra Institute of Higher Education and Research, Chennai, ¹Department of Neurosurgery, Apollo KH Hospital, Vellore, Tamil Nadu, India, ²Department of Neurosurgery, Medical School University Algiers, 16022 Algiers, Algeria, ³Department of Neurosurgery, Cheikh Zaid International University Hospital, Rabat, Morocco, ⁴CENEPE, Pediatric Neurosurgical Center, São Paulo, Brazil, ⁵Department of Neurosurgery, Rwanda Military Hospital, Kigali, Rwanda, ⁶Department of Neurosurgery, Hospital Sungai Buloh, Selangor, Malaysia, ⁷Department of Neurosurgery, Fujita Health University Bantane Hospital, Nagoya, Japan

Address for correspondence:
Dr. Dhivya Palanisamy,
Department of Neurosurgery,
Apollo KH Hospital,
Melvisharam, Vellore - 632 055,
Tamil Nadu, India.
E-mail: dhivdhivans@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Balasubramanian SC, Palanisamy D, Bakhti S, El Abbadi N, Collange NZ, Karekezi C, *et al.* Women in neurosurgery (WIN): Barriers to progress, world WIN directory and the way forward. *Asian J Neurosurg* 0;0:0.

Submitted: 24-Mar-2020

Revised: 19-Apr-2020

Accepted: 04-Jul-2020

Published: 19-Oct-2020

Access this article online

Website: www.asianjns.org

DOI: 10.4103/ajns.AJNS_108_20

Quick Response Code:



First stage: Choosing neurosurgery as a career option

Despite the fact that the percentage of female medical students worldwide is more than or equal to 50%, percentage of women in the surgical specialties remains low. For example, although the number of females entering neurosurgical residency is increasing in the last two decades, it is only 12% even in a developed country like the USA.^[2] We need to identify and address the barriers faced by women to improve this situation. A survey conducted among female neurosurgeons in India found that more than 70% of them faced discouragement regarding joining neurosurgery residency, especially by neurosurgeons themselves.^[3] The fear of gender discrimination and difficulty in balancing personal and professional life during residency could be the probable reasons. Furthermore, lack of female role models and mentors in neurosurgery is still a pertinent issue. To address these issues, the existing neurosurgical societies must promote interest in neurosurgery and present it as a promising and fulfilling career option to the medical students.

Second stage: The neurosurgical residency

Although both men and women face common difficulties doing neurosurgical residency, women have to deal with additional issues such as pregnancy and child rearing which may affect their effective performance and delay their learning of surgical skills. The attrition rate was found to be more among women residents in the USA (17% compared with 5.3% in males).^[2] A subtle selection bias does exist when it comes to mentoring a female candidate in the residency program which maybe more apparent in the developing countries where the attitude of males to WIN is judgmental and not inclusive. To overcome this, the chief and faculty should understand the specific challenges faced by the female residents and ensure equal opportunities are given to them during their training program.

Third stage: Professional growth and career

The problems faced by young WIN after their residency are related to mentoring, sub specialty practice, fellowship training, payscale and research opportunities. Although these are common to both genders, family responsibilities and childcare seem to be the major difficulties for a young female neurosurgeon and many of them find it difficult to overcome this and pursue subspecialty neurosurgical training and establish a successful practice. Although the number of fellowships being offered is in an increasing trend across the world, the number of women in these programs still continues to be low. Abosch and Ruka have very relevantly summarized the inequalities faced by WIN be it at workplace or career advancement and noted that women receive 20% less compensations as compared with men in the same positions.^[4] It was only in 2018 that the American Association of Neurological Surgeons in its 86 years history chose a woman neurosurgeon as its

president and Dr. Shelly Timmons assumed the mantle of the first female neurosurgeon lead. If this is the case in the developed world, the developing and the underdeveloped world have a lot more to accomplish in promoting gender equality in neurosurgery with regard to deficiencies faced by WIN in reaching academic and leadership positions and fighting the battle against pay disparity. At the same time, there are countries like Algeria where female neurosurgeons constitute 25%, and they do not face any discrimination by gender and the payscale is equal to that of a male neurosurgeon. Two heads of the five biggest neurosurgical departments in Algeria are women. Algeria sets an example for many other countries in promoting the WIN. We also have Prof. Najia El Abbadi who was the first female neurosurgeon to become president of the National Society of neurosurgery in Africa and Arab world and is currently president of the PanArab Neurosurgical Society. She is an example for female neurosurgeons in Africa and Arab region that it is possible to lead neurosurgery in their own countries and regions despite all the difficulties they meet.

Are we chasing the elusive work-life balance?

In a busy specialty such as neurosurgery the ideal work-life balance might seem illusive irrespective of the gender. WIN are however posed with extra challenges and having a supportive spouse and family will go a long way in ensuring the best quality of work and peace of mind. If childcare is made available at the workplace, it would be really beneficial.^[5] It is also rightly stated by Prof. Spetzler that "Competent women with passion for neurosurgery will find a way to manage both children and career."^[6] WIN in Japan and India reported more than 70% personal and professional satisfaction in their career and majority of them were able to manage their work-life balance.^[3,7] According to Prof. Yoko Kato, Japan's first female neurosurgery Professor and founder of Women's Neurosurgical Association Japan, choosing a subspecialty that is suited to one's aspirations, gender equality at workplace, equal pay scale for women and increased academic, research and publishing activities are ways through which a successful work-life balance may be achieved.^[8]

World WIN Directory

Despite all the struggles, we are definitely overcoming the barriers as evidenced by a worldwide increase in the number of women residents joining neurosurgery programs. The ACNS-Women in Neurosurgery (WINS) project 2019 was to create a world WIN directory and data on the number of female neurosurgeons in training and in practice both in private and academic institutions was collected online. The data including the number of WIN and contact details was collected over E-mail from senior faculty (heads of women neurosurgical societies, heads of neurosurgical societies and consultants) in each country and a world WIN directory has been established. The authors believe that this will greatly help to improve the communication

across the countries, help in identifying fellowship opportunities, foster mentoring, make it easier to reach out to the WIN worldwide and prove to be beneficial for the future WIN. As per the data collected so far, there are more than 3200 women across the world into neurosurgical practice and in residency. This number is expected to cross 4000 soon and data on percentage distribution of WIN in each country is awaited. The data collected so far are summarized in Table 1 (number includes practicing board certified neurosurgeons as well as female residents in training) [Figures 1-6]. This is a welcome trend and the senior WIN in faculty positions must promote mentoring and pass on the mantle to ensure that continued progress is happening through WIN forums.

Figures 1-6 country wise distribution of WIN.^[9,10]

Table 1: World win distribution- ACNS-WINS project 2019

S.No	CONTINENT	NUMBER OF WIN
1	ASIA	1244
2	EUROPE	623
3	NORTH AMERICA	642
4	SOUTH AMERICA	300
5	AFRICA	244
6	MIDDLE EAST	222
7	AUSTRALIA	21
Total WIN		3247

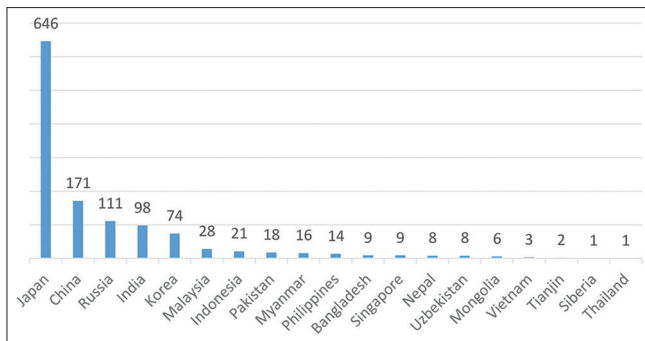


Figure 1: WIN Asia

The way forward for WIN

Looking ahead, the development of WIN is the collective responsibility of individual women neurosurgeons, senior neurosurgeons and the regional neurosurgical societies. Gender equality should be the norm during training and at workplace be it in promotions or pay scale. Only then talented women will come forward to take up challenging specialties such as neurosurgery and can contribute toward scientific advancements, research and innovations. A lion's heart and a lady's hand goes the proverbial saying for the making of a good surgeon. Moreover, the specialty of neurosurgery is no exception but all the more suited for talented women with fine surgical skills. Women in neurosurgery should be confident, perseverant and harness their innate traits to act brave and take risks head on in the operating room.^[5] They should also expand their informal social circles and validate themselves as true professionals, leaders and mentors.

Mentorship of WIN-how men can play a crucial role?

"Men can, should and must serve as mentors to women in neurosurgery" wrote Prof. Spetzler in his paper "Progress of Women in Neurosurgery."^[6] Only if men come forward to mentor women, the neurosurgical fraternity can move towards a truly equitable state where excellence will be at the forefront rather than discussions on gender equity. It is also very important that the male faculty members are given training in cultural sensitivity to understand the unique needs and differential treatment for women and only

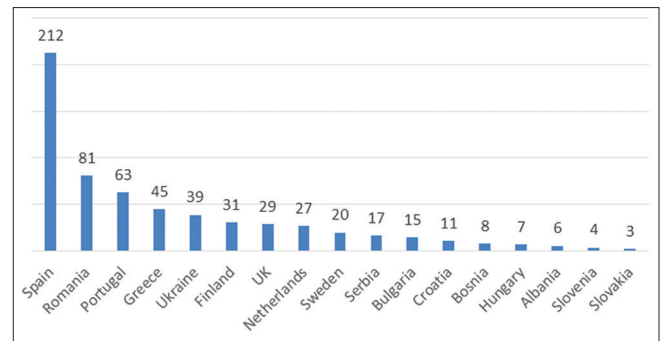


Figure 2: WIN Europe

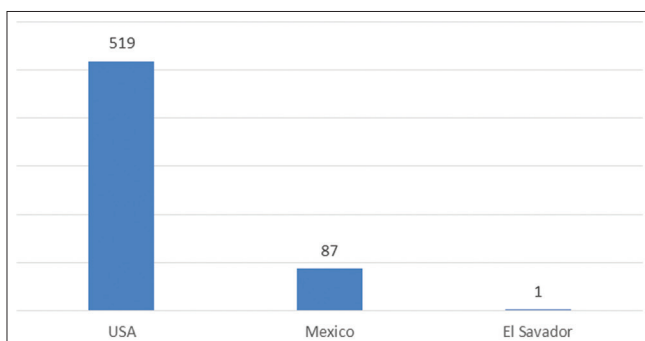


Figure 3: WIN North America

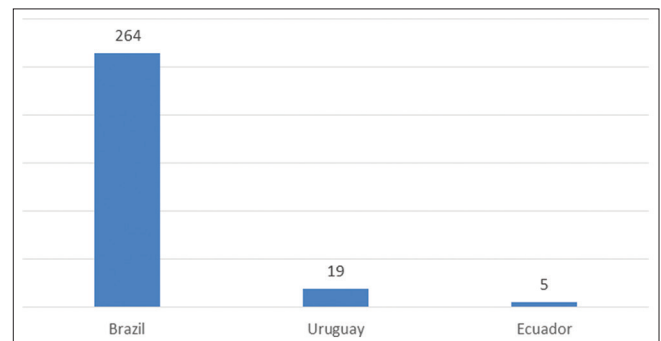


Figure 4: WIN South America

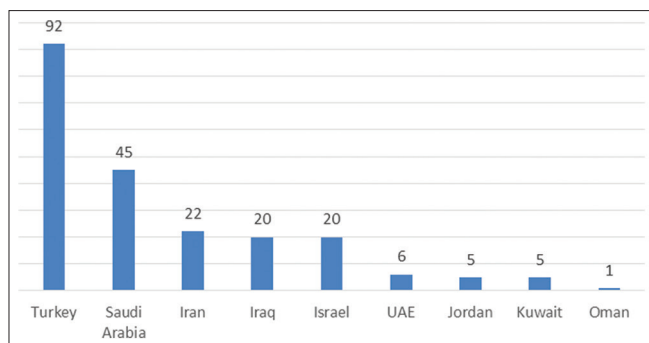


Figure 5: WIN Middle East

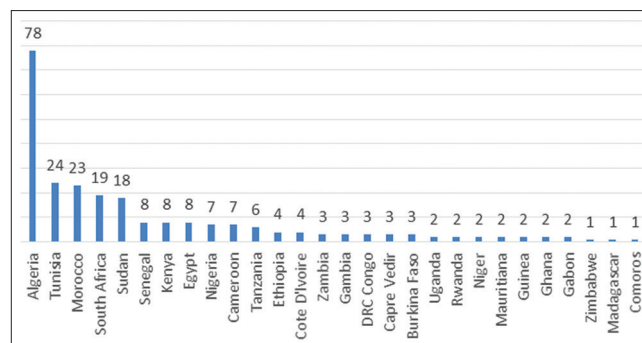


Figure 6: WIN Africa

by doing so the complaints and controversies of a double standard can be avoided.^[11] Workplace and national culture greatly influences the success of women neurosurgeons and their male counterparts should understand the disproportionate difficulties faced by female neurosurgeons in order to effectively mentor them. Mentors who are skilled in adapting to the gender needs will contribute to the growth of women in neurosurgery, enhance the leadership of both women and their own organisation and finally extend their own legacy.^[12]

Role of Neurosurgical Societies

Neurosurgical societies should acknowledge the WIN and come forward to promote participation of women in the national societies and motivate the creation of role models. Also, promotion of WIN in leadership roles in these societies is the need of the hour. This can help in fostering mentorship and inspire the female residents to enter neurosurgery. At present women neurosurgeon's forums are recognized in only a few countries like Japan, USA, Brazil, Indonesia and by a few societies like ACNS, World Federation of Neurological Surgery (WFNS) and Continental Association of African Neurosurgical Societies (CAANS). The authors believe WIN forum should be a part of every regional and national neurosurgical society so that it offers a platform for the female neurosurgeons to further their academic and surgical prowess. Motivating research activities, promoting presentations in neurosurgical conferences and publications in journals will ensure progress in their career. Financial support from the parent neurosurgical institutions and neurosurgical societies will greatly benefit the young WIN.

Conclusion

The cycle of personal growth and mentoring will be possible only when WIN reach professional and academic success in their respective organisations. This is achievable if our male counterparts and neurosurgical societies understand their responsibility to promote WIN. WIN forums should be created as part of every national neurosurgical society and the barriers for professional growth should be identified and addressed. Promoting competent women to leadership positions is the one of the ways to bring in

academic growth and success for the entire community of women in neurosurgery. Increasing fellowships and training opportunities, especially in the developing and under developed countries and facilitating exchange of scientific knowledge will not only help the WIN but the entire neurosurgical fraternity as a whole. We all must work together collectively to ensure these goals toward gender equality in neurosurgery are achieved by all means.

Acknowledgment

We would like to thank all the Women in Neurosurgery who contributed for the creation of world WIN directory, an ACNS-WINS project of the year 2019. We extend our gratitude to WFNS-WINS, CAANS-WINS, Brazilian WINS, WINS-USA, and the WFNS member societies for all their support.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Women in Neurosurgery: Past, Present, and Future Congress of Neurological Surgeons. Available from: <https://www.cns.org/publications/congress-quarterly/congress-quarterly-spring-2015/women-neurosurgery-past-present>. [Last accessed on 2019 Sep 27].
2. Renfrow JJ, Rodriguez A, Liu A, Pilitsis JG, Samadani U, Ganju A, *et al.* Positive trends in neurosurgery enrollment and attrition: Analysis of the 2000-2009 female neurosurgery resident cohort. *J Neurosurg* 2016;124:834-9.
3. Palanisamy D, Battacharjee S. What it is to be a Woman neurosurgeon in India: A survey. *Asian J Neurosurg* 2019;14:808-14.
4. Abosch A, Rutka JT. Women in neurosurgery: Inequality redux. *J Neurosurg* 2018;129:277-81.
5. Corley J, Williamson T. Women in neurosurgery: Final frontier of career women's movement. *World Neurosurg* 2018;111:130-1.
6. Spetzler RF. Progress of women in neurosurgery. *Asian J Neurosurg* 2011;6:6-12.
7. Fujimaki T, Shibui S, Kato Y, Matsumura A, Yamasaki M, Date I, *et al.* Working conditions and lifestyle of female surgeons affiliated to the Japan neurosurgical society: Findings of individual and institutional surveys. *Neurol Med Chir (Tokyo)* 2016;56:704-8.
8. Kato Y. Women in neurosurgery: A new paradigm of thought will emerge. *World Neurosurg* 2016;86:A16-7.

9. Available from: <https://www.cma.ca/sites/default/files/2019-01/neurosurgery-e.pdf>. [Last accessed on 2020 Mar 01].
10. Available from: <http://levelmedicine.org.au/resources/completed-fellowship-papers/gender-equity-in-medical-specialties/>. [Last accessed on 2020 Mar 20].
11. Hoover EL. Mentoring women in academic surgery: Overcoming institutional barriers to success. *J Natl Med Assoc* 2006;98:1542-5.
12. Bickel J. How men can excel as mentors of women. *Acad Med* 2014;89:1100-2.