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Surgical perspectives

Female surgeons and academic surgery

La mujer cirujana y la cirugía académica



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“Girls don’t do science,” was the message that Jennifer Doudna received from her high school counselor when she expressed her desire to study chemistry in college. During her professional career, she was confronted by not only these expressions, but also limitations due to questions of gender. With determination, discipline and perseverance, she achieved great feats, not only obtaining the highest award in science (2020 Nobel Prize in Chemistry for the development of CRISPR/Cas9) but also contributing to a technique that enables gene editing, with enormous implications in biology and medicine. This powerful technology allows scientists to alter DNA, the code of life, with a precision only dreamed of a few years ago.¹

Doubting the competence, capabilities and commitment of women in any field of science has never been a novelty. Social stereotypes and the roles historically assigned to women, mainly within the family, have played a predominant role in their professional definition.

In a predominantly male environment, talking about gender is a complex and controversial issue because it is a social construct inseparably linked to discrimination, which obviously impacts women but also transcends all of society. However, it is essential to fairly analyze a problem that is based not only on perceptions, but also on multiple studies and evidence, yet continues with a touch of invisibility. As long as we cannot admit that gender issues create obstacles in the professional careers of women, we are far from establishing the solutions necessary to strengthen the surgical profession in this and other challenges that deserve attention and, more importantly, action.

Thus, it is necessary to mention or be reminded of some impact data because, more than a complaint or justification,

addressing the situation in a comprehensive and impartial manner will facilitate solving the problem with greater clarity and better direction.

In recent years, there has been talk of the ‘feminization’ of medicine due to the significant presence or majority of women. This observation is transcendental because it recognizes a social phenomenon with many implications to be addressed. Despite the increase in female medical students in many countries around the world, the number of female surgical residents is significantly lower, without mentioning females in leadership positions, which go practically unnoticed.

Historically, the surgical culture has been dominated by men, as shown by the following data: in the United States of America, 20.6% of general surgeons are women (2017), yet there are only 25 female heads of surgery departments in the entire country.² In Germany, there were 7983 active female surgeons in 2018, the equivalent of 21.1% of all active surgeons.³ In Spain in 2006, female surgeons constituted 18%, and when junior members were included this reached 30%⁴; by 2019, the Spanish Association of Surgeons had 5160 surgeons, 41% of which were female. In the European Association for Endoscopic Surgeons, the number of female members is significantly lower, at 12%.⁵

Meanwhile, in Mexico, only 15.78% of the members of the Mexican Association of General Surgery are female.⁶

It is a fact that medical professionals face situations of attrition and burnout criteria. In surgeons, this phenomenon occurs in around 40%, and 30% also show signs of depression.⁷ When differentiating between the sexes, female surgeons

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have shown greater burnout (43.3% vs 39.0%; $P = .01$) and depression (33.0% vs 29.5%; $P = .02$).⁸

It has been demonstrated that women may be deterred from choosing a career in surgery due to numerous factors, including: work-life balance, small number of female role models, and gender discrimination.³

Although at least half of graduating medical students are women, only 10% of tenured professors in academic surgery are women.²

Another study has also identified a marked reduction in the participation of women when climbing the career ladder, demonstrating that while 48% are medical school graduates, surgery residents are reduced to 32.3%, and female tenured professors only constitute 7.3%.⁹

In general, a higher proportion of female professors are in the junior category, representing 49.7%. In other hierarchical positions, however, their participation is much lower: assistant 31.8%, associate 27%, and senior lecturer 22.7%.¹⁰ In other reports analyzed, the proportion coincides with this trend.¹¹

Faculty cohort studies have found that women are still less likely to be promoted than men, even after adjusting for the number of publications, number of grants, seniority versus other careers, hours worked, and specialty.⁹

Declining resource allocation has also been identified as a significant contributor to the academic disparity faced by women. In addition, female surgeons have fewer academic resources, poorer clinical support infrastructure, less secretarial support, smaller laboratory and office space, and fewer grants.¹⁰

Female participants were significantly more likely to say that their gender limited their chances of promotion compared to their male colleagues.⁹

In the opinion of Mexican surgeons, 58.7% have fewer opportunities for professional growth due to gender issues.¹²

Regarding publications, there are significant gender differences in the two academic productivity measurements evaluated: number of publications and h-index. Male surgeons publish significantly more articles than female surgeons; the mean number of articles published by women was 33.7 versus a mean of 52.3 articles by men. Likewise, it was observed that men had a significantly higher amount of h-index than their female counterparts.¹³

Another report indicates that female surgeons publish an average of 10 articles, compared to 25 in men.^{14,15} This difference is constant: female surgeons publish less.¹³

In a review by the *Revista Cirujano General* of the Mexican Association of General Surgery from 1980 to 2019, 1926 articles were published, 120 of which were written by female authors (6.2%) and 579 by female co-authors (30.0%). These numbers have increased more consistently in recent years, but they still reflect the low participation of women in this activity. Specifically, the editorial board is only 16.6% women (2019).¹⁶

In short, females continue to be disproportionately underrepresented in surgery, especially in academic surgery and in leadership positions.² Less than 10% of leaders are women, and this reality is discouraging.¹⁷

According to recent projections and unless there are drastic changes, it will take 121 years for female academic surgeons to achieve parity.¹⁸

Several studies have described mentors as elemental figures who underpin the training and development of surgeons. In a Canadian survey, 79% of participants reported having at least one mentor, 89% of whom were male mentors. The presence of female surgical role models is essential to encourage female medical students not only to enter the field of surgery but also to take on higher academic and representative leadership roles in this field.¹⁹

The presence of female academic surgeons is notably different depending on the surgical specialty. In a report by the American Association of Medical Schools in 2018, in gynecology and obstetrics females represented 63.3% (4050), general surgery 30.8% (251), ophthalmology 39.8% (1220), otorhinolaryngology 34.9% (825), plastic surgery 26.3% (119), urology 21.0% (309), neurosurgery 20.8% (425), orthopedic surgery 19.2% (790) and cardiothoracic surgery 16.1% (115). In the case of gynecology and obstetrics, women represent the majority in this specialty. Research in labor economics has shown that a profession is considered 'women's work' when 30% are of this gender, and men begin to leave the field at a faster rate.²⁰

It is undeniable that sociocultural factors are relevant in the professional performance of female surgeons. There are important factors to consider, such as motherhood, which is often delayed, in addition to the care and education of children, which has been delegated to women for generations.

This observation may be related to reports that emphasize a significant percentage of female surgeons who do not have children (40%). Similar data were obtained from Mexican female surgeons without children (37%),¹² while 92% of male surgeons have children.

In addition, there are countless references indicating that raising children and spending more time on domestic activities are also factors that hinder professional development.² Furthermore, 43% of female surgeons feel that having children is an obstacle for their career.³

Various studies have found that female physicians spend significantly more hours parenting and have less help with housework and family care compared to their married male counterparts.¹¹

For Mexican female surgeons, family responsibilities have not been a limitation to their professional career in 84%, but their profession has limited their family life in 40%. Meanwhile, 77.3% report no equality at work, 61.3% have experienced harassment (mobbing), and 48% even report sexual harassment.¹²

Female professors, despite being a minority, are the group most vulnerable to inequalities since they also have lower salaries and an even lower probability of being promoted. Academic female surgeons are 10 times more likely to perceive sexual discrimination and, if they aspire to leadership positions, they work overtime (≥ 50 h/week) significantly more frequently (81% vs 57%, $P = .0041$).³

Achieving a balance between work and family life is difficult for 69.3% of female surgeons and very difficult for 10.7%.¹² Despite such obstacles, many women in surgery enjoy their careers, and the vast majority would make the same professional decisions if they went back in time, while 58.7% are completely satisfied with their professional development.¹²

A problem that is not recognized or accepted will never have a definitive solution in the face of a changing environment of greater needs and demands. In surgery, gender disparity must be recognized, and related data has been published in detail in different scenarios with current statistics. The terms 'glass ceiling' and 'sticky floor' are still commonly used to describe the situation of women in the workplace, in this case in academic surgery, because of the difficulty involved in their growth and leadership. Despite the continuous efforts to avoid inequality between men and women in this field, inequalities persist.

The most important thing to consider is that potential solutions are not gender-related, and everyone's collaboration is required. It is necessary to involve different actors in favor of current and future surgery, which requires more interventions to achieve effective and safe surgery, as well as a broader vision.

In 1996, the American Association of Medical Colleges (AAMC) approved the first report of the Project Committee on Increasing Women's Leadership in Academic Medicine. More than two decades of efforts and initiatives have not been able to counteract this problem.

Therefore, a multimodal intervention is required, with plural and effective participation of health organizations and professionals.

Educational institutions require reforms with structured study plans aimed at responding to the healthcare needs of the population, while satisfying patients and medical professionals. At the same time, strategies need to be designed and alternatives sought to promote a better balance between work and personal life, all in accordance with current challenges yet with a vision for the future to avoid delayed responses or remaining static.

The participation of medical associations is fundamental to develop aid programs, support networks in favor of the recruitment and retention of surgeons, advise women in their professional career advancement, and promote leadership positions, all with the collaboration of both men and women. Furthermore, it is important to foster the development of effective mentors who are able to help trainees overcome obstacles and female leaders supported by the surgical community at large, empowered by an authentic sisterhood.

Responsible use of social media, through movements like #ILookLikeASurgeon and the NYerORCoverChallenge, has already begun to change the face of surgery and challenge social norms.

All this implies a cultural, social and surgical change, breaking paradigms, and not remaining as mere spectators but instead as leading actors who catalyze a real change to rebuild the surgical ecosystem, with the interaction of functional groups. Otherwise, as observers, the only thing we will obtain will be more data and results that confirm what has been identified so far.

The challenges that we face in academic surgery in the near future are not insignificant. We will have to think and act in innovative ways to provide surgical care that is up to the contemporary challenges of healthcare: constant technological development, epidemiological and demographic changes, financial limitations, etc; effective, with the best results, where the entire multidisciplinary team participates in a

significant manner; and safe to protect the patient, healthcare workers and the environment.

Make the best use of our data, knowledge and technology to proactively educate the next generation of surgeons and surgical specialists.

Women have fought for decades in their unwavering desire to be able to exercise a challenging but exciting profession, in the operating room or through their contribution to academia, aspiring to achieve true equity in joint work and complementarity, with no gender-based distinctions.

The glass ceiling has become invisible. It may have moved, but it still has not been broken. Dra. Lilia Cote Estrada, Ex presidente de la Asociación Mexicana de Cirugía General Asesora Académica en Seguridad del Paciente de la Fundación Academia Aesculap México. liliacote@hotmail.com.

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