RESEARCH ARTICLE

Representation of women in surgery in Pakistan: Analysis of trends

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Abstract

Objective: To explore empirical evidence of trends in the representation of men and women in surgical specialties in Pakistan.

Method: The descriptive, retrospective study made use of secondary data obtained from two sources. The first set, from 1963 to 2000, was sourced from a College of Physician and Surgeons of Pakistan's publication, while electronic data from 2001 to 2023 was obtained directly from the College of Physician and Surgeons of Pakistan. Data regarding gender, surgical specialty, passing year, province and city was noted. No personal, identifiable information was obtained. Data from both sources was merged within Microsoft Excel.

Results: From 1967 to 2023, there were 10,606 surgical fellows; 8,893(84%) males and 1,713(16%) females, with a male-to-female ratio of 5.2:1. Female fellows were found concentrated in paediatric surgery, ophthalmology and plastic surgery, while they had poor representation in neurosurgery, orthopaedic surgery and urology. Among the provinces, Sindh showed the least disparity with 614(30%) women surgeons, and the male-to-female ratio was 2.35:1.

Conclusion: Longitudinal data provided critical insights regarding representation of women in surgery in Pakistan.

Keywords: Women, Surgery, Pakistan, Trends, Representation. (JPMA 76: 919; 2026)

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Introduction

Globally, men outnumber women in the physician workforce in countries, including the developed ones like the United States, Canada and Australia. This is magnified in the field of surgery. For example, in the United Kingdom and the US, men form 73% and 61.6% of practicing surgeons, respectively. [1,2] The situation in Pakistan appears to be no different, with men dominating surgical clinical practice outside of the field of obstetrics and gynaecology (OB-GYN).

The College of Physicians and Surgeons in Pakistan (CPSP), established in 1962, is the national regulatory body responsible for overseeing postgraduate medical education and professional development in the fields of Medicine, Surgery, OB-GYN, Paediatrics and Dentistry. In 1967, it introduced formal examinations for awarding fellowships after completion of specialized training in a chosen field. The CPSP went on to establish a Directorate of National Residency Programme to further strengthen the training of residents, supervisors and institutional directors. [3]

According to a 2021 study, the CPSP website reveals that out of a total of 2,319 fellows, only 321 were women. [4] This number included only those who finished their postgraduate training in Pakistan, and not those who obtained their training from abroad. However, the link provided in the 2021 study did not provide access to a publicly available database through which one could discern significant trends in female representation across various surgical fields. Other small-scale surveys indicate that female representation in surgical fields in Pakistan remains limited. For example, a 2023 study provided an overview of female representation across surgical faculty positions in medical colleges across Pakistan.[5] However, the survey had limitations since it included only those who were associated with teaching hospitals. To or knowledge, comprehensive information about trends in male and female representation through the years, and across various surgical specialties is not available in the public domain.

The current study was planned to fill the gap by exploring empirical evidence of trends in the representation of men and women in surgical specialties in Pakistan.

Materials and Methods

The descriptive, retrospective study and made use of secondary data obtained from two sources. The first set, from 1963 to 2000, was sourced from an extant CPSP publication titled, "Register of Fellows, 1962-2000, Fourth Edition" which provided relatively limited information, categorising surgeons by the year of fellowship conferment and surgical specialties. [3]

The second source of data, from 2001 to 2023, was

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obtained directly from the CPSP secretariat. It consisted of information including the fellows' names, surgical specialty, fellowship number, passing year, country, province, city and gender. Personal information, such as email addresses or phone numbers, was neither requested nor provided to ensure privacy of the individuals.

From both sources, data related to the field of OB-GYN was excluded as this is a recognised independent field internationally outside the domain of General Surgery.

Data from the first source was extracted manually, and categorised according to year, surgical specialty and gender. This was then merged with the second dataset within Microsoft Excel. The study did not require ethical approval since it used only secondary data.

Data analysis was performed using Microsoft Excel. Gender ratios as well as frequencies and percentages were calculated. Line charts were utilised to document changes in representation of both male and female fellows across time in General Surgery and its different subspecialties, including Neurosurgery, Paediatric Surgery, Orthopaedic Surgery, Ophthalmology, Orthopaedics, Plastic Surgery, Thoracic Surgery, Urology and Otorhinolaryngology (ENT). Gender distribution across the provinces was also calculated, and then sub-categorised with respect to the surgical subspecialties.

Results

From 1967 to 2023, there were 10,606 surgical fellows; 8,893(84%) males and 1,713(16%) females, with a male-to-female ratio of 5.2:1. The trend of yearly distribution showed that female representation was almost non-existent up to 2000, and began to rise gradually from 2001 onwards (Figure 1).

Female fellows between 2001 and 2023 were found concentrated in Paediatric Surgery, Ophthalmology and Plastic Surgery, while they had poor representation in Neurosurgery, Orthopaedic Surgery and Urology (Table 1).

Gender distributions trends were charted for surgical specialties where there was at least one female for every three male surgeons. These included General Surgery (Figure 2) and its sub-specialties Paediatric Surgery (Figure 3), Plastic Surgery (Figure 4) and Ophthalmology (Figure 5).

Among the provinces, Sindh showed the least disparity

Table-1: Gender distribution in surgical and allied fields (2001-23).

Specialty	Total	Male n (%)	Female n (%)	Male: Female Ratios
Neurosurgery	493	460 (93)	33, (7)	14:1
Ophthalmology	1293	887 (69)	406, (31)	2.2:1
Orthopaedics Surgery	1568	1555 (99)	13, (1)	120:1
Otorhinolaryngology	710	587 (83)	123 (17)	4.8:1
Paediatric Surgery	251	182 (73)	69 (27)	2.7:1
Plastic Surgery	334	232 (69)	102 (31)	2.3:1
General Surgery	3554	2699 (76)	855 (24)	3.2: 1
Thoracic Surgery	58	50 (86)	8 (14)	6.2: 1
Urology	776	727 (94)	49 (6)	15: 1

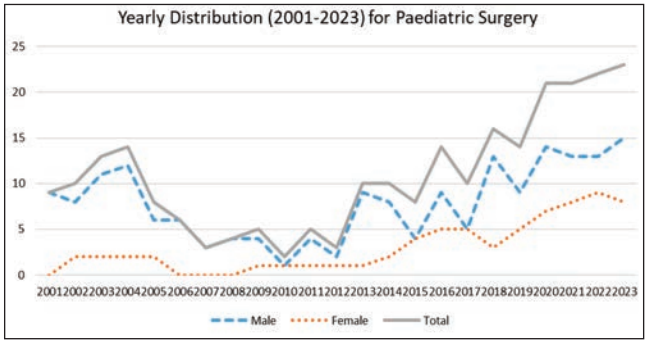

Figure-1: Year-wise distribution of surgical fellows.stress (b) Among participants.

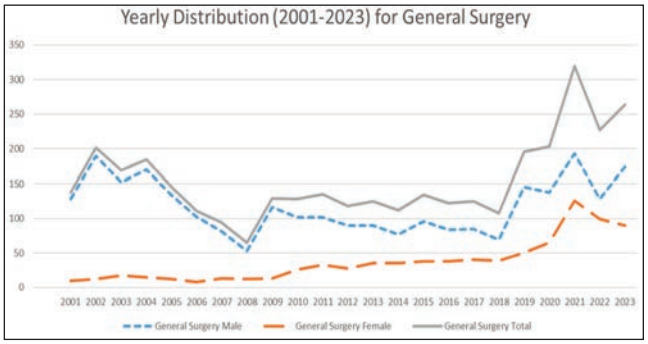

Figure-2: Year-wise distribution of surgical fellows.stress (b) Among participants.

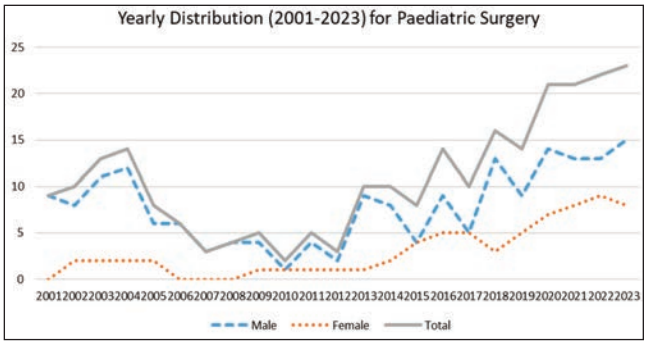

Figure-3: Year-wise distribution of Paediatric Surgery fellows.

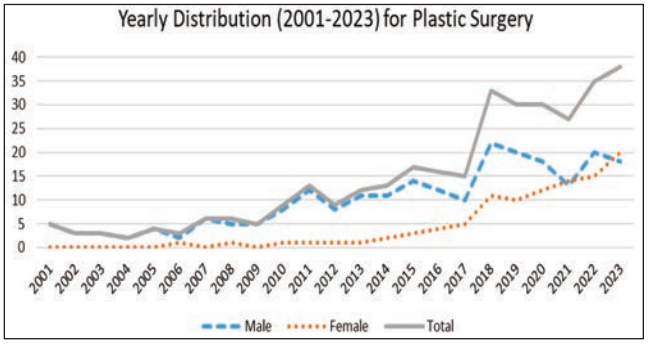

Figure-4: Year-wise distribution of Plastic Surgery fellows.

with 614 (30%) female surgeons, and the male-to-female ratio was 2.35:1 (Table 2). The distribution of fellows across the provinces with respect to the professional field of expertise was also noted (Table 3).

The fellows were concentrated mainly in the major cities, like Karachi 1,669 (81% in Sindh), Lahore 1,625 (35% in Punjab), Peshawar 1,016 (59% in KPK) and Islamabad 602 (18% in Punjab).

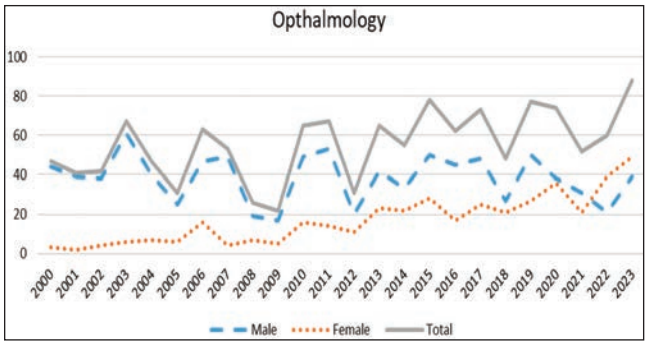

Figure-5: Year-wise distribution of Ophthalmology fellows.

Table-2: Distribution of fellows in General Surgery and its sub-specialties across the provinces (2001-23).

Province Distribution	Total Number	Male n (%)	Female n (%)	Male to Female Ratios
Sindh	2058	1444 (70)	614 (30)	2.35:1
Punjab	4674	3854 (82.5)	820, (17.5)	4.4:1
Khyber Pakhtunkhwa	1713	1572 (92)	141 (8)	11.1:1
Baluchistan	229	199 (87)	30 (13)	6.6:1

Table-3: Province-wise distribution of fellows across selected subspecialties (2001-23).

Province Distribution	Total Number	Male n (%)	Female n (%)	Male to Female Ratios
General Surgery				
Sindh	771	451 (58)	320 (42)	1.4:1
Punjab	1907	1510 (79)	397 (21)	4.4:1
KP	601	515 (86)	86 (14)	6:1
Baluchistan	107	87 (81)	20 (19)	4.3:1
Paediatric Surgery				
Sindh	74	32 (43)	42 (57)	0.76:1
Punjab	129	103 (80)	26 (20)	4:1
KP	34	33 (97)	1 (3)	33:1
Baluchistan	8	8 (100)	0 (0)	8:0
Plastic Surgery				
Sindh	68	36 (53)	32 (47)	1.1:1
Punjab	184	125 (68)	59 (32)	2.2:1
KP	60	50 (83)	10 (17)	5:1
Baluchistan	11	10 (91)	1 (9)	10:1
Ophthalmology				
Sindh	318	200 (63)	118 (37)	1.7:1
Punjab	725	484 (68)	243 (32)	1.9:1
KP	197	168 (85)	29 (15)	5.8:1
Baluchistan	17	10 (59)	7 (41)	17:1

KP: Khyber Pakhtunkhwa.

Discussion

Historically, surgery has been a male-dominated profession, with women who wish to enter it facing major hurdles. There are accounts of women undertaking surgical procedures in ancient Greece and Egypt, but these are anecdotal and rare exceptions. Surgery began to evolve as an established, respectable field during the 16th century in the Anglo European region. In 1540, Henry VIII forbade women from acquiring training or practice in the field. Following this prohibition, cases are on record of women masquerading as men to enter the field of surgery. One such example is that of Dr James Barry, born Margaret Ann Bulkley in 1789, in the United Kingdom. Dr Barry obtained a medical degree from the University of Edinburgh, and went on to serve as a reputable military surgeon in the British army for several years. The fact that Dr Barry was, in fact, a woman was discovered following her death in 1865. Dr Barry's physician, Major McKinnon, who signed her death certificate, is reported to have said, "*it [is] none of my business whether Dr Barry was a male or a female*." [6]

In the present times, gender disparity continues to persist in the surgical profession. Around the globe, the number of females in surgery is still low compared to the number of their male counterparts. The trend of women entering the field of surgery began in the mid-20th century within countries situated in the Global North. For instance, from 2000 to 2013 in the US, the percentage of female surgeons in different surgical subspecialties ranged 12-13% which has gradually been increasing in recent years. [7] According to the most recent data published by the Association of American Medical Colleges (AAMC), nearly 40% of the active surgical workforce in the US now consists of women.[8] In Pakistan, no studies exist that provide comprehensive information about the number of surgeons (both male and female) actively participating in the workforce.

The current study, to our knowledge, is the first to report on trends in the representation of male and female surgeons in General Surgery and its subspecialties in Pakistan. From 1963 to 2023, a total of 10,606 surgeons received CPSP fellowships, and 16.2% of them were females. This is a relatively small number, especially when viewed against Pakistan's rapidly growing population. Between 1960 and 2023, the country's population grew from 44.99 million to 247.5 million, a massive increase of 450.1%. The low number of surgeons in particular, and physicians in general, poses a major concern for a developing country like Pakistan that has poor health indicators, and scored 124 out of 195 on the Healthcare Quality and Access Index in 2022.[9]

The current data shows that it was not until the year 2000 that the number of women entering the field of surgery began to increase in Pakistan, albeit at a markedly slow rate, with numbers remaining <100 female fellows per year until 2018. In 2019, the percentage of female CPSP fellows increased to 19.1% and by 2023, this stood at 29%. This contrasts with the fact that women graduating from medical colleges now vastly outnumber men not only in Pakistan, but also in other countries. [10,11] In Pakistan, while 70% of medical students are women, it is estimated that 50% of them do not pursue further training or join the formal workforce following graduation. An earlier qualitative study, conducted in 2018 with medical students from four medical colleges in Karachi, suggested multifaceted reasons for this phenomenon, including the difficulties women face in balancing personal and professional lives.[12] These sociocultural reasons are magnified within the field of surgery where the demands of training and practice are even more rigorous.

The current study found that women were concentrated predominantly in three surgical subspecialties — Ophthalmology, Plastic Surgery and Paediatric Surgery — which is a trend reflected in other regions of the world as well. According to a study in the UK, surgical specialties with the highest female representations were Ophthalmology and Paediatric Surgery, followed by Plastic Surgery and General Surgery.[13] Surgical subspecialties, including Urology, Orthopaedics and Neurosurgery, had poor representation of women in another UK survey.[14] These findings are similar to the current data from Pakistan where Orthopaedic Surgery, Urology and Neurosurgery demonstrated the most disproportionate ratios in terms of male and female representation. The nature of these surgical subspecialties may explain this trend. Shorter working hours and less emergency calls in Plastic Surgery and Ophthalmology may be appealing to females who prefer a balance between personal and professional lives. This is particularly true in the Pakistani society where women tend to shoulder the majority of household and child-rearing duties. It is also possible that Ophthalmology and Plastic Surgery, requiring fine motor skills and precision, make the fields more appealing to women compared to the more physically demanding specialties, such as Orthopaedic Surgery. It is perhaps for these reasons that in Pakistan, from 2021 onwards, women outnumber men in Ophthalmology and Plastic Surgery. Nevertheless, these numbers are too small to predict with confidence whether this trend will continue in the future.

In contrast, the growing number of women entering Paediatric Surgery, a field with long working hours and emergency situations, in Pakistan and elsewhere cannot be attributed to the reasons noted above. Paediatric Surgery is a demanding subspecialty that offers limited personal time, which might otherwise be expected to discourage women from pursuing it. Yet, it is striking that in Paediatric Surgery, the ratio of women to men favours the former, particularly in the province of Sindh. In the UK, the greatest percentage (28%) of women consultants in 2024 were on Paediatric Surgery, higher than in any other surgical field.[15] Perhaps as paediatric surgeons work with children and families, it may be more attractive for women, and considered more socially acceptable.[16] Another important factor cited in the international literature is that the presence of strong female mentors in this field has encouraged younger generations of women to enter this surgical subfield.[17] This may be the case in Pakistan, but requires in-depth qualitative explorations with women paediatric surgeons regarding their motivations for joining this field.

The current data also revealed that surgeons, both male and female, were generally concentrated in the city of Karachi, the largest cosmopolitan centre of the country. This potentially explains why Sindh as a whole shows least disparity in gender ratios across the four provinces. The greatest gender disparity was noted in Balochistan, and it was the most prominent in the field of Paediatric Surgery where no female fellow graduated until 2023 (Table 3). This mirrors the broader trends in this province where educational enrolment for women and female labour force participation is generally low.[18]

The current study has limitations as it included data of only those surgeons who had obtained their training fellowships from the CPSP, and left out those who had done so from outside the country. The data also did not include those having received local degree programmes, such as a MS in Surgery. Besides, while including the CPSP fellows, the data did not differentiate between those who were in active surgical practice and those who were not practising for any reason.

Conclusions

Longitudinal data provided critical insights regarding representation of women in surgery in Pakistan. Long-term follow-up is needed to establish whether the trend of increasing number of women joining the surgical field would be sustained in the coming years. The sociocultural and economic reasons behind these trends also require deeper exploration through qualitative research.

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SSS: Concept, study design, methods, data analysis and writing.
BS: Data analysis and writing.