



## Original Research Article

# FEMALE GENERAL SURGEONS: CURRENT STATUS, PERCEPTIONS AND CHALLENGES IN INDIA

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## ABSTRACT

**Background:** Surgery has historically been regarded as a male-dominated medical specialty, despite the increasing representation of women in medical education and the healthcare workforce. The study aimed to assess gender and cultural factors influencing women's choice of general surgery in India, identify challenges faced by female surgical trainees and faculty, evaluate perceptions and awareness regarding surgery among students and surgeons, and propose practical measures to enhance women's participation, career progression, leadership, and professional advancement in general surgery.

**Materials and Methods:** This was a cross-sectional observational study conducted at a tertiary care hospital at Telangana over a period of 1 year. A total of 100 participants were included in the study, comprising 34 PG trainees, 33 faculty members, and 33 students.

**Results:** Among 100 participants, 34 PG trainees, 33 faculty, and 33 students were included. Age distribution differed significantly ( $p < 0.001$ ), while sex distribution did not ( $p = 0.685$ ). Gender influenced career progression for 67.6%, 60.6%, and 72.7%, respectively. Gender discrimination was reported by 64.7%, 54.5%, and 57.6%, while moderate/severe work-life difficulties affected 76.5%, 72.7%, and 78.8%.

**Conclusion:** We concluded that gender-related barriers persist in surgical careers in India, including discrimination; gender bias, limited leadership and operative opportunities, inadequate mentorship, and work-life challenges. Although intergroup differences were not statistically significant ( $p > 0.05$ ), these concerns emphasize the need for equitable and supportive surgical environments.

**Keywords:** Female surgeons, Gender equality, Gender discrimination, Surgical career, Work-life balance, Career advancement.

## INTRODUCTION

A number of professional and personal factors influence female medical students' decisions to pursue careers in surgery. Women may choose to pursue professions in surgery if they are positively exposed to the operating room, have intellectual challenges, find happiness in their work, and have supportive mentors and female role models.<sup>[1-3]</sup> On the other hand, female students may be deterred from entering or remaining in surgery by lengthy work hours, rigorous residency schedules, worries about work-life balance, pregnancy and maternity, and perceived gender discrimination.<sup>[3,4]</sup> Research has also shown that while the presence of positive role

models might significantly impact female students' enthusiasm in pursuing surgery, they may feel less confident or more scared during surgical rotations.<sup>[4]</sup> Even after beginning surgical training, gender-related issues may persist. Inadequate mentorship, harassment, gender stereotyping, unequal career prospects, and challenges in striking a work-life balance have all been noted by female surgeons and trainees.<sup>[5]</sup> Male-dominated workplace culture, social expectations, a lack of institutional support, and unequal chances were found to be significant obstacles to women's professional advancement in a systematic assessment of gender prejudice in surgery.<sup>[5,6]</sup> Family obligations are especially important since women may feel more pressure to

juggle work obligations with marriage, parenting, and domestic duties. These demands may have an impact on leadership prospects, academic output, career advancement, and retention in surgical specialties.<sup>[6,7]</sup> In addition to highlighting obstacles faced by female surgical postgraduates, faculty, and consultants, the study attempts to evaluate the gender and cultural aspects impacting women's choice of general surgery as a vocation in India. Additionally, it assesses the knowledge and attitudes of female medical students and surgeons about general surgery and suggests useful changes to encourage increased involvement and career advancement of women in general surgery.

## MATERIALS AND METHODS

**Type of Study:** Cross-sectional observational study

**Place of Study:** A tertiary care hospital at Telangana.

**Study Duration:** 1 year

**Sample Size:** A total of 100 female general surgeons were included in the present study.

**Inclusion Criteria:**

- Female medical students pursuing MBBS and female doctors pursuing postgraduate training in General Surgery.
- Female General Surgery postgraduates, faculty members, and consultants working in the selected institution(s).
- Participants willing to provide informed consent.
- Participants available during the study period and willing to complete the study questionnaire.

**Exclusion Criteria:**

- Male medical students, residents, faculty, and consultants.
- Female doctors not associated with General Surgery.
- Participants unwilling to provide informed consent.

- Participants who submitted incomplete or substantially missing questionnaires.

**Study Variables:**

- Age, marital status, place of residence, and family background.
- Current professional status, years of experience, academic qualification, and designation.
- Interest in General Surgery, reasons for choosing/not choosing surgery, career aspirations, and influence of mentors/role models.
- Perceived gender bias, discrimination, stereotyping, and equality of opportunities.
- Family expectations, marriage, childcare responsibilities, social norms, and work-life balance.
- Working hours, workload, training opportunities, mentorship, institutional support, and workplace environment.
- Perception of General Surgery as a career, professional satisfaction, challenges, and perceived career prospects.
- Awareness, career preference, perceived challenges, job satisfaction, and suggested measures for improving participation and advancement of women in General Surgery.

**Statistical Analysis:** Data were entered into Excel and subsequently analyzed using SPSS and GraphPad Prism. Continuous variables were summarized as means with standard deviations, while categorical variables were presented as counts and percentages. Comparisons between independent groups were performed using two-sample t-tests, and paired t-tests were applied for correlated (paired) data. Categorical data were compared using chi-square tests, with Fisher's exact test applied when expected cell counts were small. A p-value of  $\leq 0.05$  was considered statistically significant.

## RESULTS

**Table 1: Demographic Characteristics According to Study Group**

| Variable    | Category | PG Trainees | Faculty   | Students  | p-value |
|-------------|----------|-------------|-----------|-----------|---------|
| Age (years) | <25      | 4 (11.8)    | 0 (0.0)   | 29 (87.9) | <0.001  |
|             | 25–34    | 25 (73.5)   | 5 (15.2)  | 4 (12.1)  |         |
|             | 35–44    | 5 (14.7)    | 18 (54.5) | 0 (0.0)   |         |
|             | ≥45      | 0 (0.0)     | 10 (30.3) | 0 (0.0)   |         |
| Sex         | Male     | 18 (52.9)   | 20 (60.6) | 17 (51.5) | 0.685   |
|             | Female   | 16 (47.1)   | 13 (39.4) | 16 (48.5) |         |

**Table 2: Perception of Gender Equality According to Study Group**

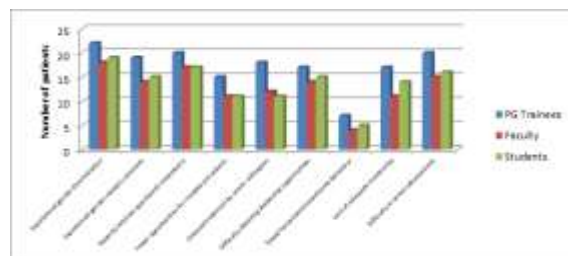
| Perception statement                                     | PG Trainees | Faculty   | Students  | p-value |
|----------------------------------------------------------|-------------|-----------|-----------|---------|
| Women have equal opportunities to pursue general surgery | 22 (64.7)   | 21 (63.6) | 15 (45.5) | 0.184   |
| Women receive equal opportunities for complex procedures | 17 (50.0)   | 20 (60.6) | 12 (36.4) | 0.139   |
| Female surgeons receive equal recognition                | 16 (47.1)   | 18 (54.5) | 12 (36.4) | 0.32    |
| Women have equal opportunities for promotion             | 18 (52.9)   | 20 (60.6) | 13 (39.4) | 0.183   |
| Women have equal leadership opportunities                | 14 (41.2)   | 18 (54.5) | 10 (30.3) | 0.146   |
| Gender influences career progression                     | 23 (67.6)   | 20 (60.6) | 24 (72.7) | 0.574   |
| Female surgeons have to work harder to prove competence  | 25 (73.5)   | 22 (66.7) | 25 (75.8) | 0.704   |
| Patients tend to trust male surgeons more                | 20 (58.8)   | 18 (54.5) | 23 (69.7) | 0.439   |

**Table 3: Experience of Gender-Based Discrimination According to Study Group**

| Workplace challenge                           | PG Trainees | Faculty   | Students  | p-value |
|-----------------------------------------------|-------------|-----------|-----------|---------|
| Experienced gender discrimination             | 22 (64.7)   | 18 (54.5) | 19 (57.6) | 0.664   |
| Experienced gender-related comments           | 19 (55.9)   | 14 (42.4) | 15 (45.5) | 0.516   |
| Patients/relatives questioned competence      | 20 (58.8)   | 17 (51.5) | 17 (51.5) | 0.799   |
| Fewer opportunities for complex procedures    | 15 (44.1)   | 11 (33.3) | 11 (33.3) | 0.56    |
| Unequal treatment by senior colleagues        | 18 (52.9)   | 12 (36.4) | 11 (33.3) | 0.22    |
| Difficulty obtaining leadership opportunities | 17 (50.0)   | 14 (42.4) | 15 (45.5) | 0.815   |
| Sexual harassment/unwelcome behaviour         | 7 (20.6)    | 4 (12.1)  | 5 (15.2)  | 0.671   |
| Lack of adequate mentorship                   | 17 (50.0)   | 11 (33.3) | 14 (42.4) | 0.398   |
| Difficulty in career advancement              | 20 (58.8)   | 15 (45.5) | 16 (48.5) | 0.527   |

**Table 4: Work-Life Balance and Attitudes Toward Women's Surgical Careers**

| Variable                                 | Category  | PG Trainees | Faculty   | Students  | p-value |
|------------------------------------------|-----------|-------------|-----------|-----------|---------|
| Work-life balance difficulty             | Mild/None | 8 (23.5)    | 9 (27.3)  | 7 (21.2)  | 0.82    |
|                                          | Moderate  | 15 (44.1)   | 14 (42.4) | 14 (42.4) |         |
|                                          | Severe    | 11 (32.4)   | 10 (30.3) | 12 (36.4) |         |
| Family responsibilities affect career    | Yes       | 21 (61.8)   | 20 (60.6) | 21 (63.6) | 0.966   |
|                                          | No        | 13 (38.2)   | 13 (39.4) | 12 (36.4) |         |
| Pregnancy/maternity affects career       | Yes       | 13 (38.2)   | 13 (39.4) | 13 (39.4) | 0.992   |
|                                          | No        | 21 (61.8)   | 20 (60.6) | 20 (60.6) |         |
| Childcare difficult with surgical duties | Yes       | 16 (47.1)   | 15 (45.5) | 17 (51.5) | 0.874   |
|                                          | No        | 18 (52.9)   | 18 (54.5) | 16 (48.5) |         |

**Figure 1: Experience of Gender-Based Discrimination According to Study Group**

A total of 100 participants were enrolled in the study, including 34 PG trainees (34.0%), 33 faculty members (33.0%), and 33 students (33.0%).

[Table 1] shows the demographic characteristics of the participants. A statistically significant difference was observed in age distribution among the three study groups ( $p < 0.001$ ). Among PG trainees, 4 (11.8%) were aged <25 years, 25 (73.5%) were aged 25–34 years, and 5 (14.7%) were aged 35–44 years. Among faculty members, 5 (15.2%) were aged 25–34 years, 18 (54.5%) were aged 35–44 years, and 10 (30.3%) were aged  $\geq 45$  years. In contrast, among students, 29 (87.9%) were aged <25 years and 4 (12.1%) were aged 25–34 years. Regarding sex, males constituted 18 (52.9%) of PG trainees, 20 (60.6%) of faculty members, and 17 (51.5%) of students, while females constituted 16 (47.1%), 13 (39.4%), and 16 (48.5%), respectively. The difference in sex distribution was not statistically significant ( $p = 0.685$ ).

[Table 2] demonstrates perceptions regarding gender equality in surgery. Equal opportunities for women to pursue general surgery were perceived by 22 (64.7%) PG trainees, 21 (63.6%) faculty members, and 15 (45.5%) students ( $p = 0.184$ ). Equal opportunities for complex surgical procedures were reported by 17 (50.0%), 20 (60.6%), and 12 (36.4%), respectively ( $p = 0.139$ ). Female surgeons were perceived to receive equal professional recognition by 16 (47.1%) PG

trainees, 18 (54.5%) faculty members, and 12 (36.4%) students ( $p = 0.320$ ). Equal opportunities for promotion were reported by 18 (52.9%), 20 (60.6%), and 13 (39.4%), respectively ( $p = 0.183$ ), while equal leadership opportunities were perceived by 14 (41.2%), 18 (54.5%), and 10 (30.3%), respectively ( $p = 0.146$ ).

Gender was considered an influencing factor in career progression by 23 (67.6%) PG trainees, 20 (60.6%) faculty members, and 24 (72.7%) students ( $p = 0.574$ ). The perception that female surgeons have to work harder to prove their competence was reported by 25 (73.5%) PG trainees, 22 (66.7%) faculty members, and 25 (75.8%) students ( $p = 0.704$ ). Similarly, the perception that patients tend to trust male surgeons more was reported by 20 (58.8%), 18 (54.5%), and 23 (69.7%), respectively ( $p = 0.439$ ). None of these differences was statistically significant.

[Table 3] presents experiences of gender-based discrimination and workplace challenges. Gender discrimination was reported by 22 (64.7%) PG trainees, 18 (54.5%) faculty members, and 19 (57.6%) students ( $p = 0.664$ ). Gender-related comments were experienced by 19 (55.9%), 14 (42.4%), and 15 (45.5%), respectively ( $p = 0.516$ ). Patients or relatives questioning professional competence was reported by 20 (58.8%) PG trainees, 17 (51.5%) faculty members, and 17 (51.5%) students ( $p = 0.799$ ).

Fewer opportunities for complex surgical procedures were reported by 15 (44.1%) PG trainees, 11 (33.3%) faculty members, and 11 (33.3%) students ( $p = 0.560$ ). Unequal treatment by senior colleagues was reported by 18 (52.9%), 12 (36.4%), and 11 (33.3%), respectively ( $p = 0.220$ ). Difficulty obtaining leadership opportunities was reported by 17 (50.0%) PG trainees, 14 (42.4%) faculty members, and 15 (45.5%) students ( $p = 0.815$ ). Sexual harassment or unwelcome behaviour was reported by 7 (20.6%), 4

(12.1%), and 5 (15.2%), respectively ( $p = 0.671$ ). Lack of adequate mentorship was reported by 17 (50.0%) PG trainees, 11 (33.3%) faculty members, and 14 (42.4%) students ( $p = 0.398$ ). Difficulty in career advancement was reported by 20 (58.8%), 15 (45.5%), and 16 (48.5%), respectively ( $p = 0.527$ ). None of the workplace challenges demonstrated a statistically significant difference among the three groups.

[Table 4] describes work–life balance and attitudes toward women's surgical careers. Mild or no difficulty with work–life balance was reported by 8 (23.5%) PG trainees, 9 (27.3%) faculty members, and 7 (21.2%) students. Moderate difficulty was reported by 15 (44.1%), 14 (42.4%), and 14 (42.4%), while severe difficulty was reported by 11 (32.4%), 10 (30.3%), and 12 (36.4%), respectively. The difference was not statistically significant ( $p = 0.820$ ).

Family responsibilities were perceived to affect career development by 21 (61.8%) PG trainees, 20 (60.6%) faculty members, and 21 (63.6%) students ( $p = 0.966$ ). Pregnancy or maternity was considered to affect career progression by 13 (38.2%), 13 (39.4%), and 13 (39.4%), respectively ( $p = 0.992$ ). Difficulty managing childcare alongside surgical duties was reported by 16 (47.1%) PG trainees, 15 (45.5%) faculty members, and 17 (51.5%) students ( $p = 0.874$ ). Again, no statistically significant differences were observed among the three study groups.

## DISCUSSION

The present study, “Female General Surgeons: Current Status, Perceptions and Challenges in India,” assessed perceptions of gender equality, discrimination, career progression, mentorship, leadership, and work–life balance among 100 participants comprising PG trainees, faculty members, and students. Although age distribution differed significantly between the groups ( $p < 0.001$ ), reflecting their different professional stages, sex distribution was comparable ( $p = 0.685$ ). Regarding gender equality, 64.7% of PG trainees, 63.6% of faculty, and 45.5% of students perceived that women had equal opportunities to pursue general surgery, while equal opportunities for complex procedures were reported by 50.0%, 60.6%, and 36.4%, respectively; none of these differences was statistically significant. Nevertheless, the findings suggest that formal equality of access may not necessarily translate into equivalent operative exposure, recognition, or advancement. This observation is consistent with Bellini et al., who reported persistent perceptions of surgery as a male-dominated profession and substantial experiences of gender discrimination among women surgeons.<sup>[8]</sup> while Lim et al. identified male-dominated surgical culture, gender stereotyping, inadequate mentorship, harassment, and work–life imbalance as recurring barriers to women's surgical careers.<sup>[9]</sup> In the present

study, gender was perceived to influence career progression by 67.6% of PG trainees, 60.6% of faculty, and 72.7% of students ( $p = 0.574$ ), while 73.5%, 66.7%, and 75.8%, respectively, believed that female surgeons had to work harder to demonstrate their competence ( $p = 0.704$ ). These findings are comparable with Rasmussen et al., who demonstrated substantially greater perceptions of gender bias among female general surgeons and identified gender and family-related factors as important influences on career satisfaction and professional development.<sup>[10]</sup> Similarly, Ouyang et al. demonstrated that gender bias persisted across four decades of surgical training, with implicit bias remaining evident among contemporary female surgical graduates.<sup>[11]</sup> In the present study, more than half of the participants also perceived that patients tended to trust male surgeons more, reported by 58.8% of PG trainees, 54.5% of faculty, and 69.7% of students ( $p = 0.439$ ), suggesting that patient perceptions may represent an additional barrier to professional recognition. Experiences of gender discrimination were reported by 64.7% of PG trainees, 54.5% of faculty, and 57.6% of students ( $p = 0.664$ ), while gender-related comments were reported by 55.9%, 42.4%, and 45.5%, respectively. Patients or relatives questioning professional competence was reported by 58.8% of PG trainees and 51.5% of both faculty and students. These findings are consistent with Indian evidence from Palanisamy and Battacharjee, who documented gender discrimination and substantial work–life challenges among women neurosurgeons.<sup>[12]</sup> and Shales et al., who demonstrated persistent gender disparities among cardiothoracic surgeons in India, including discrimination and differences in professional opportunities.<sup>[13]</sup> In the present study, 44.1% of PG trainees, 33.3% of faculty, and 33.3% of students reported fewer opportunities for complex procedures, while unequal treatment by senior colleagues was reported by 52.9%, 36.4%, and 33.3%, respectively. Although these differences were not statistically significant, the findings are clinically relevant because unequal access to operative exposure and senior support may affect technical development and long-term career progression. Leadership and mentorship also emerged as important concerns, with difficulty obtaining leadership opportunities reported by 50.0% of PG trainees, 42.4% of faculty, and 45.5% of students, while inadequate mentorship was reported by 50.0%, 33.3%, and 42.4%, respectively. Warner et al. similarly identified mentorship deficits, professional advancement, unconscious bias, and family responsibilities as important contributors to perceived gender disparities in surgical leadership.<sup>[14]</sup> Sexual harassment or unwelcome behaviour was reported by 20.6% of PG trainees, 12.1% of faculty, and 15.2% of students, highlighting the continuing importance of psychologically safe and respectful surgical workplaces, consistent with previous qualitative evidence identifying harassment as a recurrent experience among women in surgery.<sup>[9]</sup>

Work-life balance represented another major challenge, with moderate or severe difficulty reported by 76.5% of PG trainees, 72.7% of faculty, and 78.8% of students ( $p = 0.820$ ). Family responsibilities were perceived to affect career development by 61.8%, 60.6%, and 63.6%, respectively ( $p = 0.966$ ), while pregnancy or maternity was perceived to influence career progression by approximately 38–39% across all groups. Childcare difficulties alongside surgical duties were reported by 47.1% of PG trainees, 45.5% of faculty, and 51.5% of students ( $p = 0.874$ ). These findings are consistent with Palanisamy and Battacharjee, who reported considerable difficulty balancing professional and personal responsibilities among Indian women neurosurgeons.<sup>[12]</sup> and with Rasmussen et al., who demonstrated the negative influence of family and childbearing considerations on perceived surgical career progression.<sup>[10]</sup> Overall, although no statistically significant differences were observed between PG trainees, faculty, and students for perceptions of gender equality, discrimination, career progression, leadership, mentorship, or work-life balance (all  $p > 0.05$ ), the consistently high proportions reporting gender bias, discrimination, perceived competence-related barriers, inadequate mentorship, and work-life difficulties indicate that these remain important concerns within the surgical environment. The findings support the need for transparent operative and academic opportunities, structured mentorship programmes, equitable promotion and leadership pathways, effective mechanisms for preventing and addressing harassment, supportive maternity policies, accessible childcare, and institutional measures promoting work-life integration. Such interventions are necessary to move beyond merely increasing women's representation in surgery toward achieving substantive and sustainable gender equity within the Indian surgical workforce.

## CONCLUSION

We concluded that gender-related barriers remain important challenges in surgical careers in India, despite broadly similar perceptions among PG trainees, faculty members, and students. Gender bias, discrimination, limited access to complex surgical procedures, inadequate mentorship, restricted leadership opportunities, and work-life balance difficulties were commonly perceived across all three groups. Family responsibilities, pregnancy or maternity, and childcare were also recognized as important factors potentially affecting women's surgical career progression. Although most intergroup differences were not statistically significant ( $p > 0.05$ ), the consistent reporting of these challenges indicates that gender equity remains an important concern throughout the surgical career pathway. The findings emphasize the need for

equitable operative opportunities, transparent promotion and leadership pathways, structured mentorship, supportive maternity and childcare policies, improved work-life integration, and effective institutional mechanisms to prevent gender discrimination and harassment. Addressing these barriers is essential for promoting professional equality, career advancement, retention, and sustainable participation of women in general surgery in India.

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