

Educational and sociocultural determinants of surgical career interest among female medical students in Nigeria: a national cross-sectional study

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Abstract

Background

Women remain significantly underrepresented in the surgical workforce globally, influenced by complex sociocultural and institutional factors that shape career preferences. In Nigeria, however, there is limited data on how female medical students perceive and select surgical careers. This study, therefore was designed to examine patterns of surgical interest and the factors that influence specialty choice among female medical students in Nigeria.

Methods

This study employed a descriptive cross-sectional design among fifth- and sixth-year female medical students from 16 medical schools across Nigeria. The primary outcome was self-reported interest in pursuing a surgical specialty. A total of 541 students completed the survey, with participants stratified by school and year of study. Descriptive statistics, chi-square tests of association, multivariable logistic regression, and thematic analysis of open-ended responses were used in the analysis. Electronic informed consent was obtained from all participants prior to data collection.

Results

Among participants, 46.9% expressed interest in a surgical career, with Anesthesia (17.6%), Ophthalmology (13.8%), and General Surgery (13.6%) most preferred. Motivating factors included love for procedures, mentorship, and memorable surgical postings, while barriers were high stress, long hours, and work–life balance concerns. Surgical interest was significantly associated with membership in a surgical interest group ($p < 0.001$), encouragement from female faculty ($p < 0.001$), and perceptions that cultural expectations ($p = 0.024$) or lack of female role models ($p < 0.001$) discourage women. Membership in a surgical interest group (AOR = 3.80, 95% CI: 1.95–7.41), encouragement from female faculty (AOR = 1.98, 95% CI: 1.33–2.96), perceived lack of female role models (AOR = 2.01, 95% CI: 1.37–2.95), and perceived challenges in family–career balance (AOR = 0.63, 95% CI: 0.43–0.91) independently predicted interest.

Conclusion

There is a notable level of interest among female medical students in pursuing core surgical specialties. However, concerns about balancing family and surgical careers, cultural discouragement, and lack of mentorship are significant deterrents. The findings highlight the need for targeted interventions to mitigate deterrents to pursuing surgical careers and to actively shape students' interests, with the goal of promoting gender equity in the surgical workforce.

Introduction

The increase in the number of women in the medical workforce is one of the most significant demographic shifts in global healthcare in the 21st century (1, 2). While women have achieved parity in the number of medical school admissions and choice of non-surgical specialties, surgical disciplines remain stubbornly resistant to this demographic transition (3–6). Historically, this disparity was attributed to an assumption that a smaller number of women in medical school led to lower numbers in surgical residencies. Hence, they would naturally trickle down into surgical residencies over time. However, recent epidemiological surveillance of the global surgical workforce suggests otherwise, with less than one-third of surgeons worldwide being women (3, 4).

At the turn of the 21st century, only 20.3% of surgeons from North America were female (7). While this figure has improved over time, women still face significant barriers in joining surgical subspecialties. For instance, it has been reported that in the USA, women make up only 15% of applicants for residency programs in thoracic surgery, urology, orthopedic surgery, and neurosurgery (7). In Africa, the picture is even worse. Current data from the College of Surgeons of East, Central and Southern Africa (COSECSA) region, which shares critical infrastructural and educational parallels with the West African context, reveals a phenomenon of "workforce stagnation." Between 2015 and 2022, while the absolute number of surgeons in the region expanded by 42% to meet population demands, the proportion of female surgeons remained static at approximately 10% (8). Analysis of the results of the West African College of Surgeons primaries reveals that only 34.5% of the successful candidates were female.

In Nigeria, a 2017 study revealed female surgeons' distribution: 12 (22.2%) of the cohort were registrars, 18 (33.3%) were senior registrars, and 24 (44.4%) were specialists (9). One respondent (1.85%) had an academic professorial chair (9). This is significantly low, considering the large population of the nation. A study conducted in Bayelsa State, Nigeria, found that the ratio of male to female surgeons in core surgical specialties within public health facilities in the state was 5:1, while in surgical subspecialties, it was 3:1 (10). Similarly, a cross-sectional survey of the Nigerian neurosurgical workforce in 2024 confirmed that out of 132 specialist neurosurgeons, only five were women, representing 3.8% of the consultant workforce (11). This near-total exclusion persists despite evidence that patients treated by female surgeons may experience lower postoperative mortality rates, suggesting that the gender gap has tangible implications for patient safety and quality of care (12).

Despite growing awareness of gender disparities in surgery, many female medical students continue to opt for non-surgical specialties, often influenced by long-standing trends and systemic barriers. A cross-sectional study of medical students in Nigeria in 2025 identified Surgery as the most preferred first-choice specialty (40.7%) among the total student population, with a significant male predilection for Cardiothoracic Surgery, Neurosurgery and General Surgery (13). In a study conducted among final year medical students at the University of Ibadan, Nigeria, only 15.6% of females indicated interest in surgical specialties, compared to 47.4% seen in males (14). Another study by Lawal and Afolabi (2010)

comparing interest in surgical specialties among interns found that 52.1% of male interns chose surgery, compared to just 13.0% of female interns (15).

Various studies have cited gender-based discrimination, lack of female role models, family life and lifestyle as deterrents to an interest in surgical specialties (16–18). In Nigeria, studies suggest concerns about family/social life, lack of female mentors and poor work-life balance as possible deterrents to women pursuing careers in surgery (11, 15, 19, 20). Although these studies were not conducted among medical students, they follow the same trends seen among other international and national studies (13, 14, 21, 22). Academic performance, exposure to surgical environments, and mentorship play pivotal roles in shaping these interests, with many women often weighing personal motivations, job satisfaction, and lifestyle compatibility when choosing their specialties.

Among those interested in surgery and surgical subspecialties, most females seem to gravitate towards Obstetrics/Gynecology, Ophthalmology, General Surgery and Plastic Surgery, with lower numbers seen in Orthopedics, Neurosurgery and Urology (6, 11, 13, 19, 21, 22). Abolarinwa and Osuoji (2017) had similar results with Plastic Surgery topping the list at 30.6%, followed by Pediatric Surgery with 18.4% (9). They posit that the subspecialties gaining more ground are due to them being lifestyle-friendly, although personal interest and mentors were the reasons stated that guided the choice of surgical specialty.

The existing literature clearly establishes significant gender disparities in surgical specialties despite the increase in the number of female medical graduates (23). However, significant gaps remain in our understanding of these dynamics within the Nigerian context. Additionally, there is insufficient research focusing specifically on penultimate and final-year female medical students in Nigeria, which is a critical period when specialty decisions crystallize and for which interventions can yield better results than what is obtainable at later stages (24).

Understanding female medical students' interest in surgery is essential for addressing gender disparities within the surgical workforce and ensuring a more inclusive medical profession. By exploring the factors that influence their career choices, we can better inform workforce planning, mentorship initiatives, and policy reforms that encourage more women to pursue surgery.

Furthermore, increasing female representation in surgery is not only a matter of equity but also of improving patient care and fostering innovation (12). Diverse healthcare teams are known to lead to better decision-making and problem-solving, which ultimately results in better patient outcomes. Additionally, female surgeons can bring valuable perspectives that may drive new approaches in surgical techniques and patient care, enriching the field and benefiting the healthcare system as a whole (25). The themes explored in this study are consistent with a growing body of educational research demonstrating that specialty interest formation among medical students is not merely a personal preference but a process actively shaped by the clinical learning environment, mentorship structures, and sociocultural context. Evidence from curricular research has shown that structured educational modules significantly influence student engagement, motivation, and professional identity formation (26). At the national level, gender, cultural expectations, and institutional context have been shown to

play a major role in shaping learners' academic choices and future career directions, with considerable variation across geographical settings (27). Furthermore, the quality of perceived support within educational settings – whether in-person or otherwise – meaningfully affects learners' confidence and long-term career retention (28). These findings situate the present study within the broader educational literature, framing female medical students' interest in surgical careers as an outcome shaped as much by educational experience as by individual disposition. This study was, therefore designed to examine the patterns of surgical interest and the factors that influence specialty choice among female medical students in Nigeria.

Methods

Study design

This study utilized a descriptive cross-sectional design. This was due to its appropriateness in evaluating the prevalence, predictors, deterrents, and perception of female medical students' interest in pursuing a surgical specialty.

Outcomes

The primary outcome was self-reported interest in pursuing a surgical specialty (yes/no). Secondary outcomes included: preferred surgical specialty, perceived motivating factors, perceived barriers to pursuing a surgical career, and factors associated with surgical career interest, including sociodemographic characteristics, mentorship exposure, and perception-related variables.

Sampling technique

A stratified sampling technique was used to ensure adequate representation across the lists provided by the included medical schools. Stratification was carried out to ensure that each school and class was proportionately represented. Within each stratum, simple random sampling was then used to select participants from eligible fifth and sixth-year medical students.

Sample size determination

The total population size was estimated to be 1440 considering an average of 90 female students per school (fifth year and sixth year). The sample size was calculated using the Cochran's formula along with the adjusted sample size for finite population and a 10% non-response rate. The calculated minimum sample size was 337.

Study setting and population

This study was carried out in 16 medical schools in Nigeria, including schools from all geopolitical zones and across federal, state and private institutions, ensuring a diverse sample in terms of geopolitical location and institutional type. This study recruited fifth and sixth-year medical students from the selected medical schools, having had clinical rotations in surgery, making them an ideal group to assess career decision-making, particularly in relation to surgical specialties. The medical schools of the following schools were involved in this study: Igbinedion University, Bingham University, Afe Babalola University, Bowen University, Lagos State University, Ladoke Akintola University, Ebonyi State University, Benue State University, University of Ibadan, University of Benin, University of Port Harcourt, Ahmadu Bello University, University of Nigeria, University of Abuja, University of Maiduguri and Usmanu Danfodiyo University. Inclusion criteria were: (i) students currently enrolled as a fifth- or sixth-year medical student in one of the 16 participating medical schools; (ii) female sex; and (iii) provision of electronic informed consent. Students on academic leave and exchange students were excluded.

Survey instrument

Data were collected using a structured, self-administered online questionnaire developed specifically for this study to obtain information on sociodemographic characteristics, interest in surgery, surgical specialty preferences, predictors, enablers, deterrents, and perceptions. Perception-related items were rated on a five-point Likert scale ranging from strongly disagree to strongly agree. The questionnaire was developed following a comprehensive review of existing literature and reviewed by an experienced surgeon for content validity. Face and content validity were further assessed through a pilot study involving fifth- and sixth-year female medical students from universities not included in the main study population, and feedback from the pilot was used to refine item clarity and wording prior to final deployment. An English language version of the survey is provided as Supplementary File 1.

Data collection procedure

Data were collected using a self-administered online questionnaire hosted on KoboToolbox. The link to the survey was shared to participants' email or WhatsApp contact. The purpose of the study and instructions for completion were provided to ensure participants provided informed consent electronically before filling the survey. Responses were automatically captured and stored on a protected cloud account accessible to only the research team. Data collection spanned May 2025 to August 2025. Only medical students currently in the fifth or sixth year of study in any of the selected 16 medical school were included.

Data analysis

Data collected were cleaned in Microsoft Excel and subsequently exported to IBM SPSS Statistics version 27 for analysis. Descriptive statistics were used to summarize respondents' sociodemographic characteristics, interest patterns, and specialty preferences, and results were presented using tables, bar charts, pie charts, frequencies, and percentages. For perception related items, responses of strongly

disagree, disagree, and neutral were collapsed and classified as disagree, while agree and strongly agree were classified as agree. Chi-square tests were conducted to examine associations between sociodemographic variables, exposure factors, mentorship factors, perception-related variables, and interest in pursuing a surgical specialty. Variables that were significant at the bivariate level were entered into a multivariable logistic regression model to identify independent predictors of interest in surgery. Open-ended responses were analyzed using manual thematic coding to identify recurring themes explaining reasons for career interest or change in interest. Only questionnaires with complete responses on the primary outcome variable and key exposure variables were included in the analysis.

Ethical consideration

Ethical approval

for this study was obtained from the Joint University of Ibadan/University College Hospital Health Research Ethics Committee (IRB No. 25/0327). All procedures adhered to the ethical principles outlined in the Declaration of Helsinki. Electronic informed consent was obtained from all participants prior to completing the survey, with the study purpose, voluntary nature of participation, and data confidentiality clearly communicated.

Results

Sociodemographic characteristics of female medical students

A total of 541 female medical students participated in the study, with a mean (SD) age of 23.9 (2.0) years. As shown in Table 1, most respondents were aged 24–25 years (41.2%), followed by those aged 22–23 years (35.7%), while a smaller proportion were aged 19–21 years (7.0%) and 26 years or older (16.1%). In terms of academic distribution, over half of the participants were in their sixth year (55.3%), while 44.7% were in their fifth year. Nearly half of the respondents (46.9%) expressed an interest in pursuing a surgical specialty (Fig. 1). Among those interested, the majority made their decision during clinical school (73.6%). Conversely, among students who were not interested in surgery, 40.4% had previously considered the field but changed their minds, most commonly during clinical school (88.8%), suggesting that experiences encountered in the clinical phase may either strengthen or weaken interest in surgical careers.

Table 1. Sociodemographic characteristics of female medical students (n = 541)

Variable	Frequency (n)	Percentage (%)
Age group (years)		
19–21	38	7.0
22–23	193	35.7
24–25	223	41.2
26 +	87	16.1
Year of study		
5th Year	242	44.7
6th Year	299	55.3
Interest in pursuing a surgical specialty		
Yes	254	46.9
No	287	53.1
Stage of medical school when decision was made among those interested in surgery (n = 254)		
Clinical school		
Before clinical school	187	73.6
	67	26.4
Previous interest in a surgical specialty among those without interest (n = 287)		
Yes	116	40.4
No	171	59.6
Stage of medical school when the mind change was made (n = 116)		
Clinical school		
Before clinical school	103	88.8
	13	11.2

Surgical specialty preferences among female medical students

As shown in Table 2, Anesthesia (17.6%), Ophthalmology (13.8%), and General Surgery (13.6%) were the most preferred surgical specialties overall among female medical students. Anesthesia and

Ophthalmology also recorded the highest mean interest ratings (3.7 ± 2.3 and 3.1 ± 2.3 , respectively – Table 2, Fig. 2). Beyond these, Cardiothoracic Surgery and Plastic & Reconstructive Surgery ranked notably high as alternative choices: Cardiothoracic Surgery appeared as the second choice for 26 students (10.2%) and the third choice for 22 (8.7%), while Plastic & Reconstructive Surgery was selected as the second choice by 30 respondents (11.8%) and as the third choice by 31 (12.2%). Interestingly, Neurosurgery, though less common overall (7.9%), ranked high as a first-choice specialty for 33 students (13.0%).

Table 2
Distribution of surgical specialty preferences

Surgical specialty	1st choice f (%)	2nd choice f (%)	3rd choice f (%)	Pooled frequency (n)	Percentage (%)	Mean (SD)
Anesthesia	42 (16.5%)	55 (21.7%)	37 (14.6%)	134	17.6	3.7 (2.3)
Ophthalmology	47 (18.5%)	23 (9.1%)	35 (13.8%)	105	13.8	3.1 (2.3)
General Surgery	35 (13.8%)	33 (13.0%)	36 (14.2%)	104	13.6	2.8 (2.3)
Cardiothoracic Surgery	33 (13.0%)	26 (10.2%)	22 (8.7%)	81	10.6	2.9 (2.4)
Plastic & Reconstructive Surgery	19 (7.5%)	30 (11.8%)	31 (12.2%)	80	10.5	2.9 (2.1)
Orthopedic & Trauma Surgery	21 (8.3%)	22 (8.7%)	23 (9.1%)	66	8.7	2.4 (2.2)
Pediatric Surgery	9 (3.5%)	24 (9.4%)	24 (9.4%)	57	7.5	2.1 (2.0)
Neurosurgery	33 (13.0%)	16 (6.3%)	11 (4.3%)	60	7.9	2.2 (2.4)
Urology	11 (4.3%)	16 (6.3%)	14 (5.5%)	41	5.4	1.9 (2.1)
Otorhinolaryngology (ENT)	4 (1.6%)	9 (3.5%)	21 (8.3%)	34	4.5	1.8 (1.8)

Association between sociodemographic, exposure and mentorship factors and interest in surgery

As presented in Table 3, bivariate analysis revealed no significant associations between age group, year of study, or family background and interest in surgery ($p > 0.05$). However, membership in a surgical

interest group ($\chi^2 = 24.48$, $p < 0.001$) and encouragement from female faculty ($\chi^2 = 13.38$, $p < 0.001$) were significantly associated with greater interest in pursuing a surgical specialty.

Table 3

Association between sociodemographic, exposure and mentorship factors and interest in surgery among female medical students (n = 541)

Variable	Interested n (%)	Not Interested n (%)	χ^2	p-value
Age group (years)			0.68	0.877
19–21	18 (47.4)	20 (52.6)		
22–23	95 (49.2)	98 (50.8)		
24–25	101 (45.3)	122 (54.7)		
26 +	40 (46.0)	47 (54.0)		
Year of study			0.17	0.680
6th Year	138 (46.1)	161 (53.9)		
5th Year	116 (47.9)	126 (52.1)		
Family member who is a doctor			0.69	0.406
Yes	117 (49.0)	122 (51.1)		
No	137 (45.4)	165 (54.6)		
Family member who is a surgeon			0.07	0.791
Yes	48 (50.0)	48 (50.0)		
No	69 (48.3)	74 (51.8)		
Opportunity for assistantship during surgical procedure			2.74	0.098
Yes	107 (51.4)	101 (48.6)		
No	147 (44.1)	186 (55.9)		
Participation in surgical skills workshop			1.61	0.204
Yes	61 (52.1)	56 (47.9)		
No	193 (45.5)	231 (54.5)		
Membership in surgical interest group			24.48	< 0.001
Yes	45 (77.6)	13 (22.4)		
No	209 (43.3)	274 (56.7)		
Encouragement by female faculty member to consider surgery			13.38	< 0.001

Variable	Interested n (%)	Not Interested n (%)	χ^2	p-value
Yes	95 (59.0)	66 (41.0)		
No	159 (41.8)	221 (58.2)		

Association between perceptions and interest in surgery among female medical students (n = 541)

Perception-related factors showed significant associations with interest in pursuing a surgical specialty (Table 4). Among students who agreed that women surgeons struggle to balance family and career, a lower proportion expressed interest in surgery compared to those who disagreed (42.1% vs. 50.8%; $\chi^2 = 4.10$, $p = 0.043$). Students who agreed that women surgeons struggle to balance family and career were significantly less likely to express interest in surgery ($\chi^2 = 4.10$, $p = 0.043$), reflecting how concerns about work–life balance may discourage pursuit of surgical careers. Conversely, those who agreed that cultural expectations discourage women from pursuing surgery ($\chi^2 = 5.07$, $p = 0.024$) and that lack of female role models dissuades trainees from surgery ($\chi^2 = 16.69$, $p < 0.001$) were more likely to express interest, possibly indicating resilience and motivation to challenge gender barriers and underrepresentation within the surgical field.

Table 4

Association between perceptions and interest in surgery among female medical students (n = 541)

Perception Statement	Interested	Not Interested	χ^2	p-value
Surgery is better suited for men			2.96	0.085
Agree	37 (38.9)	58 (61.1)		
Disagree	217 (48.7)	229 (51.3)		
Women surgeons struggle to balance family and career			4.10	0.043
Agree	101 (42.1)	139 (57.9)		
Disagree	153 (50.8)	148 (49.2)		
Patients are more confident in male surgeons			0.02	0.891
Agree	113 (47.3)	126 (52.7)		
Disagree	141 (46.7)	161 (53.3)		
A woman can be as competent a surgeon as a man			2.66	0.103
Agree	241 (47.9)	262 (52.1)		
Disagree	13 (34.2)	25 (65.8)		
Cultural expectations discourage women from pursuing surgery			5.07	0.024
Agree	175 (50.6)	171 (49.4)		
Disagree	79 (40.5)	116 (59.5)		
Lack of female role models dissuades trainees from pursuing surgery			16.69	< 0.001
Agree	169 (54.5)	141 (45.5)		
Disagree	85 (36.8)	146 (63.2)		
Subspecialties like Anesthesia and Ophthalmology are better suited for women			0.18	0.670
Agree	71 (45.5)	85 (54.5)		
Disagree	183 (47.5)	202 (52.5)		

Multivariable logistic regression analysis of factors associated with interest in pursuing a surgical career

In the multivariable logistic regression model (see Table 5), membership in a surgical interest group (AOR = 3.80, 95% CI 1.95–7.41, $p < 0.001$), encouragement from a female faculty member (AOR = 1.98, 95% CI 1.33–2.96, $p = 0.001$), and the belief that a lack of female role models discourages trainees (AOR = 2.01, 95% CI 1.37–2.95, $p < 0.001$) were independently associated with greater interest in pursuing a surgical career. Conversely, students who believed that women surgeons struggle to balance family and career were significantly less likely to express interest (AOR = 0.63, 95% CI 0.43–0.91, $p = 0.013$). Age group, year of study, and perception of cultural expectations were not statistically associated with surgical interest ($p > 0.05$).

Table 5

Multivariable logistic regression analysis of factors associated with interest in pursuing a surgical career

Variable	Adjusted Odds Ratio (AOR)	95% CI	p-value
Age group (years)	0.93	0.74–1.17	0.534
Year of study	0.91	0.62–1.33	0.619
Membership in a surgical interest group	3.80	1.95–7.41	< 0.001
Encouragement from female faculty member	1.98	1.33–2.96	0.001
Belief: Women surgeons struggle to balance family and career	0.63	0.43–0.91	0.013
Belief: Cultural expectations discourage women from surgery	1.30	0.87–1.93	0.203
Belief: Lack of female role models dissuades trainees from surgery	2.01	1.37–2.95	< 0.001

Perceived barriers and challenges to pursuing a surgical career

In Table 6, stimulating factors among those interested in surgery included love for procedures (44.9%), presence of role models and mentors (43.7%), memorable surgical postings (40.9%), and prestige (40.6%), suggesting that meaningful engagement and mentoring relationships significantly enhance motivation. Among students uninterested in surgery, the main barriers were high stress levels (69.7%), long working hours (66.6%), and work–life balance concerns (59.6%), followed by the length and rigor of training. Notably, lack of female mentors (19.2%) and male dominance (12.9%) were reported.

Table 6
Perceived stimulating factors and barriers to pursuing a surgical career

Stimulating factors (n = 254)	Frequency (n)	%
Role models and surgical mentors	111	43.7
Hands-on experience	100	39.4
Prestige	52	20.5
Income potential	103	40.6
Love for procedures	114	44.9
Memorable surgical posting experience	104	40.9
Intellectually stimulating	78	30.7
Private practice opportunities	62	24.4
Others	22	8.7
Barrier (n = 287)	Frequency (n)	%
Level of stress	200	69.7
Long working hours	191	66.6
Work–life balance concerns	171	59.6
Length of training	136	47.4
Lifestyle during residency	130	45.3
Rigorous training	114	39.7
Lack of confidence in surgical skills	71	24.7
Negative surgical posting experience	59	20.6
Lack of female mentors or role models	55	19.2
Male-dominated field	37	12.9
Fear of making critical errors	96	33.5
Lack of encouragement from faculty	28	9.8
Others	24	8.4

Reasons for change of interest from surgery

As illustrated in Table 7, among the 116 respondents who had previously considered surgery but later changed their minds, 49.1% attributed this decision to workload intensity and work–life balance

concerns, while 25.9% cited shifts in personal preference. Other reasons included length of training, negative learning environments, gender-related perceptions, and lack of encouragement.

Table 7
Reason for change of interest from surgery (n = 116)

Themes	Frequency (Percentage)	Sample statements
Workload/Worklife balance/intensity of training/work	57 (49.1%)	It looked better imagining it, the reality is not what I envision for myself; To me, the cons outweigh the pros; The unpredictable hours and workload; The stress of standing for hours in performing surgery
Length of training	6 (5.2%)	The length of training; Long training hours
Preference	30 (25.9%)	I just didn't find it interesting anymore; God is leading me somewhere; Another specialty caught my interest
Concerns about the learning environment	4 (3.4%)	The learning environment was not appealing; Had terrible experience in junior surgery posting
Gender related perceptions	4 (3.4%)	I wanted to specialize in orthopedic but I was told and have also seen that orthopedic surgeons need to have large body mass and build, which I lack; I also want to look feminine; It's not womanly; I was interested in Urology but everyone I told always said "what is a female doing in that field" and after a while I started asking myself the same question.
Logistical concerns	2 (1.7%)	Decreased chances of getting into residency in that specialty
Lack of encouragement	4 (3.4%)	I saw more role models outside surgery and some made some comments that made me rethink surgery like ridiculing female surgeons
Self-perception	3 (2.6%)	Self-doubt; I don't think I have the strength and skills
Fear of blood/blood borne infection	4 (3.4%)	The constant exposure to blood; Fear of contracting blood borne infections such as HIV /AIDS, hepatitis B
Others	8 (6.9%)	No reason, undecided

Discussion

Surgery has historically been a male-dominated field, with women underrepresented in most core surgical specialties worldwide (29–31). Despite increasing numbers of female medical graduates, persistent sociocultural, institutional, and professional barriers continue to influence their career choices. Understanding the factors that attract or dissuade women from pursuing surgical careers is crucial, not only for achieving gender equity in medicine, but also for ensuring a diverse and competent surgical workforce. A considerable number of the female medical students (46.9%) from this study showed interest in pursuing surgical specialties. A similar pattern was seen in a 2025 study from Saudi

Arabia, which reported 50.3% interest among female medical students (32). This is a strong indication that a lot of females are genuinely drawn to surgical specialties (9). Importantly, the majority of the students in this study made up their minds during their clinical years, showing how powerful the learning environment is in shaping choices (33, 34).

Medical students frequently enter their clinical years with a pre-existing enthusiasm for surgery, shaped by preclinical exposure to anatomy, personal aspirations, and broader cultural narratives around surgical practice. However, the transition into the clinical environment serves as a critical inflection point, where initial enthusiasm is either consolidated or extinguished. In this study, 40.4% of respondents reported having previously considered a surgical career before changing their minds, with the overwhelming majority (88.8%) attributing this shift to experiences encountered during clinical rotations. This pattern is particularly significant from an educational standpoint, as it suggests that the clinical learning environment – rather than individual disposition – is often the decisive factor in surgical career disengagement. This suggests that what they see and experience during training can either strengthen or completely break their interest (35). Hostile attitudes, poor teaching, or stressful rotations make students endure postings rather than develop interests (36).

The top three specialties of choice from the mean interest rating were Anesthesia, Ophthalmology, and Plastic Surgery. Although, as per first choice, the order of the top three was Ophthalmology (18.5%), Anesthesia (16.5%), and General Surgery (13.8%). These areas already have a growing female presence, which could make students feel more comfortable imagining themselves there (37, 38).

Otorhinolaryngology, Urology, Pediatric Surgery, and Neurosurgery sit at the bottom of the preference list, likely reflecting stereotypes, perceptions of extremely intense workloads, or the absence of visible female mentors. A 2024 study involving neurosurgical consultants and residents reported that women still face significant disadvantages within the field, including barriers to entry and completing training (11). The study also noted concerns such as strain on family life, scarcity of mentorship, and reduced social support, all of which contribute to the challenges women encounter in neurosurgical practice. If these difficult experiences are being expressed by women who are already navigating the training pathway, it is hardly surprising that students view the specialty through a cautious lens.

Importantly, membership in surgical interest groups and encouragement from female faculty were significantly associated with choosing a surgical specialty ($p < 0.001$). In fact, the odds of having interest are more than three times that of someone who is not part, according to this study. Students often need someone who looks like them and believes in them to reinforce the idea that they belong. Interest groups also offer hands-on workshops, mentorship, networking, and a safe space to explore surgical skills without pressure (39, 40). Altogether, the study shows that female interest in surgery is strong, but sustaining that interest requires a welcoming environment, good mentorship, and consistent exposure that makes surgery feel achievable rather than intimidating.

Now, regarding the perceptions of these students, it was statistically significant that "Women surgeons struggle to balance family and career" ($p = 0.043$), which highlights the concern of work-life balance that

is usually important to female doctors. A 2024 systematic review highlighted this challenge among female surgeons (41). It also echoed the fact that females in surgery lacked support, faced harassment, and had unequal opportunities (41). Another significant finding is the perception that "cultural expectations discourage women from pursuing surgery" ($p = 0.024$). It is understandable for them to hold such views, considering the setting. Nigeria is a society where cultural norms, gender expectations, and traditional family structures still play a major role in shaping the choices of young women. Many girls grow up hearing that certain careers are too demanding, too unfeminine, or too disruptive to family responsibilities (42). In many communities, women are advised to choose paths that allow them to remain available for childcare, domestic duties, and marital commitments. Surgery, with its demanding hours and long training duration, often clashes with these expectations (36, 43, 44). Because of this, young female trainees may internalize subtle or direct messages that they should avoid specialties considered too intense or too male dominated.

The third perception is that "lack of female role models dissuades trainees from pursuing surgery" ($p < 0.001$). Not only is this significant, but it is also very strong, showing that many students are actively looking for examples they can relate to (45, 46). In a sociocultural context where girls are often taught to follow the footprints of other women, the absence of visible female surgeons reduces confidence and reinforces doubts about whether such a path is realistic. This further explains why having more women in surgery can create ripple effects. When female trainees see women succeeding in a field that is culturally seen as unsuitable for them, it challenges long-held gender norms, reshapes expectations, and encourages more women to step forward. Our findings strongly support this by showing that the odds of having interest in surgery are doubled when there is encouragement from female faculty, which was statistically significant.

Interestingly, the odds of holding the belief that female surgeons struggle to balance family and career are 0.63 times lower among students who already have an interest in surgery. This is understandable, as many students sustain their interest after observing real-life examples of women who successfully manage both professional and family responsibilities. In a context where cultural expectations often suggest that women must choose between career and family, these role models show that it is possible to thrive in both. A 2025 study involving cardiothoracic surgeon mothers and their spouses reported positive outcomes, highlighting how these women maintain fulfilling careers while remaining actively involved in family life (47). Similarly, a 2020 study revealed that female surgeons participate fully in childcare, meal planning, travel arrangements, and other family duties (48). Together, these findings illustrate that commitment to a surgical career does not necessarily preclude meaningful family engagement. Therefore, it is important to strengthen visibility, mentorship, and supportive networks to ensure that sociocultural barriers do not discourage aspiring female surgeons from pursuing their goals.

The leading factors that stimulated interest in surgery were the presence of role models or surgical mentors, hands-on experience, love for procedures, perceived income potential, and memorable surgical posting experiences, consistent with studies showing that targeted mentoring improves attitudes toward surgery (16) and that women often choose surgical careers when they have visible role models (49). In

contrast, the most frequently cited deterrents were high stress levels, long working hours, concerns about work–life balance, the length and rigor of training, and lifestyle during residency. These concerns mirror findings from a Nigerian study among female neurosurgical trainees and specialists, where erosion of family life, lack of mentors, heavy workload, and limited time for social engagement were major challenges (11, 19), and align with a UK national survey identifying work–life balance as a key determinant of specialty choice (50). Work–life balance concerns are often grounded in the perception that motherhood and surgical training cannot coexist due to the overlap between residency years and childbearing years, reinforcing the perceived incompatibility between a surgical career and the responsibilities of women of reproductive age (3). Similar patterns were also observed among Nigerian pre-interns, where stress, family plans, and difficult training deterred interest in surgery (15). Mentorship has been consistently highlighted internationally as a major barrier, with a scoping review identifying lack of effective mentorship as a widespread challenge (51). Moreover, our finding that some students changed their minds after initially expressing interest in surgery mirrors observations from Australian women who left surgical training (52), suggesting that early enthusiasm can diminish when faced with the realities of surgical training. In our study, this previous interest may have been driven in part by the perceived prestige of surgery, but became discouraged during clinical school when students encountered many of the same factors that deter female medical students more broadly from pursuing surgical careers.

The open-ended responses from students who had previously considered surgery but subsequently disengaged offer adds to the depth of findings of this study. Beyond the expected concerns about workload and work-life balance, students articulated deeply personal and contextual reasons for their disengagement – doubts about physical suitability, gender identity concerns, internalised discouragement from peers and faculty, fear of occupational exposure to blood-borne infections, and in some cases, spiritual reasoning. These reveal that the process of surgical career disengagement is far more layered and individualised than the quantitative findings alone suggest. This study therefore points clearly toward the need for dedicated qualitative inquiry as the logical next step in this research area. A qualitative study, drawing on in-depth interviews or focus group discussions with female medical students, particularly those who have disengaged from surgery during clinical training, would provide the contextual richness and interpretive depth needed to fully understand the lived experiences behind the patterns documented here. Longitudinal research tracking the trajectory of surgical career interest would further clarify whether the determinants identified in this study have lasting influence on actual specialty choice. Together, such studies would build the evidence base needed to design interventions that are not only statistically informed but deeply attuned to the realities of female medical students navigating their futures in surgery.

Strength and limitations

This study represents the first national survey focusing exclusively on female medical students in Nigeria to examine patterns of interest in surgical careers and the factors influencing their choices. Its major strengths include the large and diverse sample, drawn from 16 medical schools across all

geopolitical zones and encompassing private, state, and federal institutions, thereby enhancing the representativeness and generalizability of the findings. The study also contributes meaningfully to ongoing discussions on promoting gender equity within the surgical workforce by identifying modifiable determinants such as mentorship and clinical exposure.

Several limitations should be acknowledged. The cross-sectional design precludes causal inference, and the directionality of observed associations cannot be established from this data alone. Non-response bias cannot be entirely excluded, as students who declined participation may differ systematically from those who responded. The dichotomisation of five-point Likert scale responses into agree and disagree categories, while analytically practical, may have resulted in some loss of nuance, particularly for respondents who selected neutral. Social desirability bias cannot be excluded, particularly for items relating to gender and cultural expectations. The survey instrument, while piloted and content-validated, was not psychometrically validated. Finally, expressed interest in surgery reflects stated intention rather than actual career outcomes.

Conclusion

Female medical students in Nigeria show meaningful interest in surgical careers, but this interest is fragile and context-dependent. The clinical learning environment, mentorship, and sociocultural expectations are not peripheral influences — they are central determinants of whether that interest survives training. Addressing these factors through deliberate educational and institutional interventions is therefore not optional but essential, both for achieving gender equity in the surgical workforce and for ensuring that capable women are not lost to surgery simply because the environment failed them.

Recommendations

Based on the findings of this study, interventions to enhance female participation in surgical careers should operate at three levels: the educational environment, institutional policy, and professional culture.

At the educational level, medical schools should formalise structured mentorship programs that connect female medical students who have expressed interest in surgery with practicing female surgeons. Such targeted mentorship is most impactful when initiated early in the clinical years, precisely the period when this study demonstrates that interest is most vulnerable to attrition. Surgical interest groups should be actively promoted and adequately resourced, as membership was the strongest independent predictor of surgical career interest in this study. These platforms provide guidance on career planning, work-life integration, and navigating sociocultural barriers at a stage when career decisions are still malleable. Beyond mentorship, deliberate effort should be made to increase the participation of female surgeons as supervisors, demonstrators, and teachers during surgical postings, ensuring that interested students encounter visible and relatable role models within the formal curriculum, not only in extracurricular spaces. Faculty training on gender-sensitive and inclusive supervision is equally critical, as hostile attitudes, discouraging remarks, and poor teaching practices during clinical rotations are among the

most significant drivers of surgical career disengagement identified in this study. Creating a clinical environment where female students feel welcomed, capable, and encouraged is arguably the most upstream intervention available to medical schools.

At the institutional level, policies that support work-life balance must be prioritised. Flexible training schedules, structured parental leave, and accessible childcare support are not peripheral provisions — they directly address the concerns about family-career compatibility that this study identifies as a significant deterrent to surgical career interest. Professional bodies, including the West African College of Surgeons, should consider reviewing residency training structures to reduce unnecessary attrition and to make surgical training more compatible with the realities of women's lives, without compromising the rigour that the specialty demands. Admissions processes into surgical residency programs should also be examined for gender-related structural disadvantages that may discourage qualified female applicants from applying in the first instance.

At the level of professional culture, the achievements of women in surgery — particularly in underrepresented specialties such as neurosurgery, urology, and paediatric surgery — should be deliberately and consistently celebrated through conferences, publications, and institutional platforms. Showcasing their accomplishments both within and beyond the operating theatre challenges the prevailing cultural narrative that surgery is incompatible with womanhood or family life. National surgical bodies and medical schools alike have a role to play in amplifying these stories, as evidence from this study suggests that the mere perception of female role models is sufficient to significantly increase the odds of surgical career interest among female students. Where female surgical role models are scarce, near-peer mentorship — connecting junior students with female surgical residents rather than consultants alone — should be explored as a practical and scalable alternative.

Declarations

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ETHICS APPROVAL AND INFORMED CONSENT TO PARTICIPATE

Ethical approval for this study was obtained from the Joint University of Ibadan/University College Hospital Health Research Ethics Committee with IRB number 25/0327. All procedures adhered to the ethical principles outlined in the Declaration of Helsinki.

CONSENT FOR PUBLICATION

Not Applicable.

AVAILABILITY OF DATA AND MATERIALS

This will be made available on request from the corresponding author.

CONFLICT OF INTEREST

The authors declare no conflict of interest with respect to the publication of this article.

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AUTHORS' CONTRIBUTIONS

AAA, AOO and ODA conceived the study and designed the research protocol. AAA, AOO, ODA, IAA, JOI, OFI, FMM, CCO, HOA, REE, GGC, QON, OPO MME and VOD administered the survey instrument. PIO performed the data analysis. AAA, AOO, ODA, PIO and IAA drafted the manuscript. TAL provided overall supervision throughout the study period and critically reviewed the final draft. All authors read and approved the final version of the manuscript.

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Figures

Female Medical Students' Interest in Surgery

Proportion indicating current interest

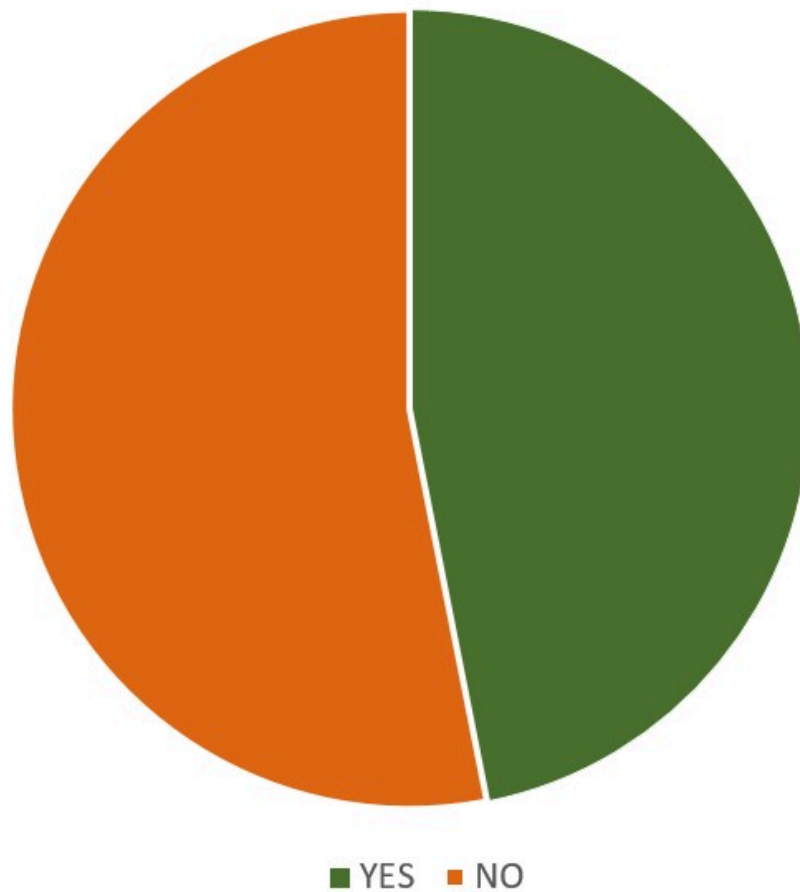


Figure 1

Proportion of female medical students interested in surgery

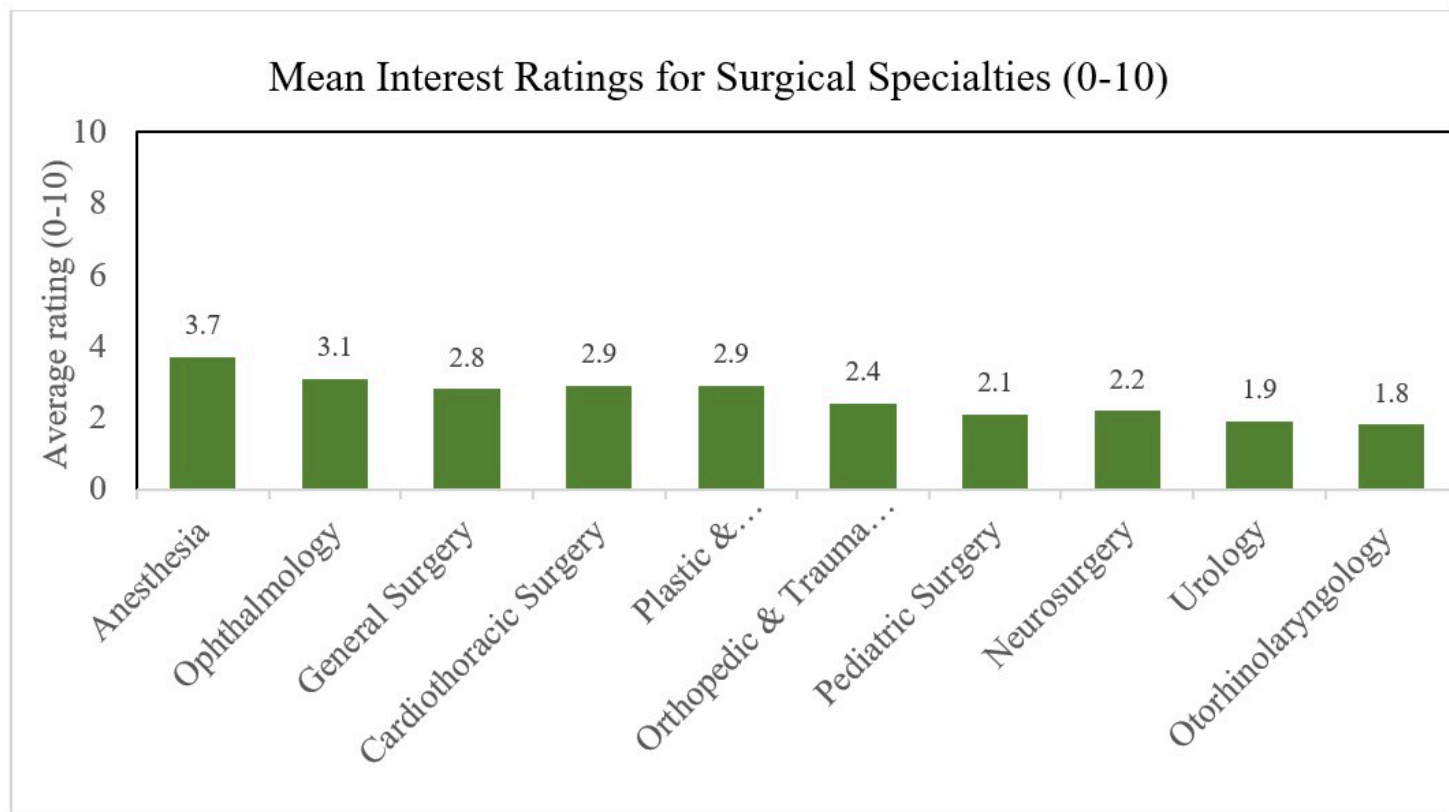


Figure 2

Mean interest ratings for surgical specialties among female medical students

Supplementary Files

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- [SupplementaryFile1.pdf](#)