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Original Research Article

Determinants and gender differences in specialty choice among medical students and house officers in Punjab: a cross-sectional study

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ABSTRACT

Background: The career choices students make determine the future composition and distribution of the physician workforce. This study aimed to identify the factors that medical students and house officers in Punjab perceive as influencing their choice of future specialty, and to assess gender differences in those choices.
Methods: A cross-sectional survey was conducted among MBBS students and house officers from various medical colleges and hospitals in Punjab, Pakistan, between June and November 2025. All enrolled MBBS students from first to final year and house officers were invited to participate. A minimum sample size of 384 was calculated. Data were analyzed using SPSS version 25, with descriptive and inferential statistical methods applied.
Results: Participants (mean age 22.43±1.78 years) were predominantly female (58.1%). Gender differences were significant (χ^2, p=0.006): gynecology and obstetrics and dermatology were preferred specialties by females, whereas gastroenterology and cardiology were more commonly selected by male respondents. Gender showed bivariate associations with specialty choice (p=0.006). In a multinomial logistic regression, only academic year independently predicted specialty preference (likelihood-ratio χ^2=66.68, df=40, p=0.005; Nagelkerke R^2=0.171). The most attractive factors influencing specialty choice were the opportunity to make a meaningful impact on patients' lives.
Conclusions: Medical students' and house officers' specialty choices in Punjab are influenced by multiple personal and academic factors, with gender-based differences. Understanding these influences can help medical educators and institutions provide targeted career counseling and support informed specialty decision-making.

Keywords: Career counseling, Career choices, Decision-making, Specialty preference, Specialty choice

INTRODUCTION

The quality of healthcare in any country is influenced by the number of physicians available in each specialty. A diverse specialty mix is therefore necessary to ensure patients receive optimal care.[1] The specialties students select for their careers shape the composition of the physician workforce. These choices therefore have important consequences for achieving a balanced distribution of doctors across fields.[2-4] Recently, there has been growing interest in medical students' career preferences.[5] Throughout medical school, students encounter a broad spectrum of clinical specialties.[4] Medical socialization and interaction with peers, health

professionals, and patients foster professional identity formation, guiding students from generalist trainees to fully specialized physicians.[6,7] Choosing a medical specialty is an important decision for students, with long-term effects on their career, emotional well-being, and financial security. This choice is influenced by personal interests, lifestyle goals, academic experiences, socioeconomic background, and family or social expectations.[8,9]

In Malaysia, Teng et al reported that postgraduate training prospects and opportunities for international mobility were prioritized by many students over purely clinical interests.[10] In Bangladesh, Iktidar et al reported that about two-thirds of medical students favored internal medicine or general specialties, mainly because of lifestyle considerations, income prospects, and social respect.[11] These findings highlight the wide diversity of factors influencing specialty choice across different settings.

Similar trends are seen in Pakistan, but with a clear cultural influence. Research by Qasmi et al and Bilal et al suggests that family pressure strongly affects students' choices, especially in cities where parents tend to favor prestigious and financially rewarding specialties.[12,13] As a result, community-oriented fields such as general practice, family medicine, and public health, despite being essential to Pakistan's long-term healthcare objectives, are frequently overlooked. Moreover, recent data from Aga Khan University revealed that 96% of final-year students intended to pursue postgraduate training abroad, further reflecting a mismatch between student goals and the country's local healthcare needs.[14]

Published studies indicate that surgery, internal medicine, pediatrics, and obstetrics and gynecology are among the most frequently chosen specialties by medical students. Female students tend to favor fields that offer better work-life balance, whereas male students more often prefer higher-income specialties.[15] Furthermore, research has found that male students are generally more inclined than females to pursue studies and careers abroad.[16]

Although several studies have explored factors influencing medical students' career choices in Asia, there is limited research focusing specifically on students in Punjab. Exploring the factors behind career choices among medical students can help balance the workforce, strengthen community-based care, and support informed career decisions. This study aimed to identify the key factors influencing medical students' specialty choices in Punjab.

METHODS

This study is a cross-sectional survey to identify factors influencing specialty choice among MBBS students and house officers at various public and private sector medical colleges and hospitals in Punjab, Pakistan. Responses were received from 12 medical colleges located in six major cities of Punjab, Pakistan. Over a six-month period from June to November 2025 we invited all enrolled MBBS medical students from first year to final year and House officers to participate. Data was collected using an online structured questionnaire using the google survey platform and distributed through social media channels. The study's objectives were explained to participants, and written informed consent was obtained online prior to filling out the questionnaire. Assuming a 50 percent prevalence and a 5 percent margin of error, the minimum sample size was 384; this was increased to 400 to allow for non-response and missing data. We employed convenience sampling, recognising its limits for generalisability. Of 384 respondents, 119 who reported "not decided/GP/any specialty" were excluded from the factors survey because it asks about influences on a specific specialty; the remaining 265 respondents (259 who selected a medical/surgical specialty and 6 who selected a basic-science specialty) completed the 25-item factors questionnaire and formed the denominator for analyses of influencing factors. The present study was designed in accordance with the ethical principles of the Declaration of Helsinki. The study protocol and design were approved by the institutional board review at Services Institute of Medical Sciences, Lahore.

The questionnaire was structured into three sections with close-ended questions. The first section collected sociodemographic information, including gender, year of study, and annual academic percentage score (%). The second section focused on participants' preferred specialties. The final section presented 25 factors, which participants rated as less attractive, more attractive, or having no influence on their choice of a future specialty.

Data analysis was then performed using SPSS version 25. Continuous variables were summarized using means while categorical variables were described using frequencies and percentages. Bivariate associations between categorical variables were assessed using the chi-square test. A p value <0.05 was considered statistically significant. Multivariable multinomial logistic regression is used to identify independent predictors of specialty preference (four-category outcome; reference = house officers). Age, gender, academic year and percentage score were entered simultaneously; results are presented as adjusted relative risk ratios (RRR) with 95% confidence intervals, and model significance was assessed by the likelihood-ratio test with Nagelkerke's R^2 reported.

RESULTS

A total of 384 medical students participated in the survey (mean age 22.43±1.78 years); 161 (41.9%) were male and 223 (58.1%) were female. Among them, 34 (8.9%) were first-year MBBS students, 35 (9.1%) second-year, 35 (9.1%) third-year, 44 (11.5%) fourth-year, 189 (49.2%) final-year, and 47 (12.2%) house officers. Out of 384 students, 10 (2.6%) had academic percentage of 50-59%, 167 (43.5%) scored 60-74%, 134 (34.9%) scored 75-79%,

and 73 (19.0%) achieved 80% or above. In general, female students had higher academic percentage than males. The demographics are mentioned in Table 1.

Table 1: Socio-demographic details.

Variables		Number	Percent
Gender	Male	161	41.9
	Female	223	58.1
Current year of study	1st year	34	8.9
	2nd year	35	9.1
	3rd year	35	9.1
	4th year	44	11.5
	final year	189	49.2
	House Officer	47	12.2
Academic performance (%)	50-59	10	2.6
	60-74	167	43.5
	75-79	134	34.9
	>80	73	19.0

Of the 384 students, 160 (41.7%) opted for a medical specialty, 99 (25.8%) for a surgical specialty, 6 (1.6%) for a basic science, 6 (1.6%) as general physicians without a specialty, 17 (4.4%) for any specialty, and 96 (25.0%) had not yet decided as in Table 2.

Table 2: Preferred speciality.

Variable	Number (%)
Medical specialty	160 (41.7)
Surgical specialty	99 (25.8)
Basic science specialty	6 (1.6)
General physician without specialty	6 (1.6)
Any specialty	17 (4.4)
Not decided yet	96 (25.0)
Total	384 (100)

Majority of the MBBS students has selected the specialty of their choice during clinical years of study (31.3%) while 20.8 % has decided their specialty during basic years of study and 15.4% has decided before getting into medical school.

Among the 384 respondents, 259 (67.4%) reported having a planned medical or surgical specialty. The overall prevalent specialties of choice were internal medicine 41 (15.8%), general surgery 26 (10.0%) and cardiothoracic surgery 26 (10.0%). These were followed by dermatology 22 (8.1%), gynecology and obstetrics 20 (7.7%), pediatrics 17 (6.6%) and neurosurgery 17 (6.6%). All remaining specialties account for less than 5%. Almost 0.8% of the studied population has not decided yet that which specialty will be preferred by them as in Figure 1.

Majority of the students wanted to pursue specialties because they allow them to influence patients' lives 185 (48.2%) followed by clinical diagnostic skills 175 (45.6%) and opportunity to perform procedures 170 (44.3%) and approval of their family 158 (41.1%) and the appeal of being in this specialty 157 (40.9%). The least attractive factors are the degree of stress associated with specialties, with residency length and high competitiveness as shown in Table 3.

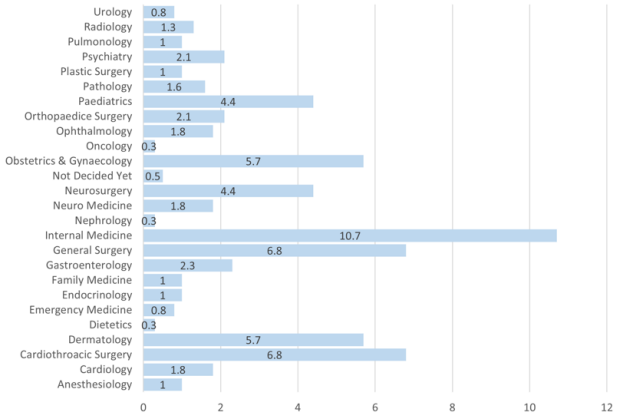

Figure 1: Major factors influencing specialty choice among MBBS students.

Table 3: Factors affecting the decision of preferred future specialties among students.

	Less attractive, N (%)	More attractive, N (%)	No influence, N (%)
The time away from work	89 (33.6)	99 (37.4)	77 (29.1)
The appeal of being in this chosen specialty	55 (20.8)	157 (59.2)	53 (20.0)
The difficulty of getting into this specialty (highly competitive specialty)	105 (39.6)	102 (38.5)	58 (21.9)
I will be more satisfied with my family	55 (20.8)	158 (59.6)	52 (19.6)
Opportunities for a part time worker in this specialty	81 (30.6)	109 (41.1)	75 (28.3)
The variety of patients (all ages, both genders)	62 (23.4)	148 (55.8)	55 (20.8)
The length of residency years	100 (37.7)	87 (32.8)	77 (29.4)
Opportunity to perform procedures	43 (16.2)	170 (64.2)	52 (19.6)
Relies on clinical diagnostic skills	58 (21.9)	175 (66.0)	32 (12.1)
Portrayal of different specialties in media	70 (26.4)	120 (45.3)	75 (28.3)
The likelihood that can influence patient's lives	54 (20.4)	185 (69.8)	26 (9.8)
Opportunities to do research in this field	68 (25.7)	148 (55.8)	49 (18.5)

Continued.

	Less attractive, N (%)	More attractive, N (%)	No influence, N (%)
The high income	71 (26.8)	148 (55.8)	46 (17.4)
The degree of stress	121 (45.7)	80 (30.2)	64 (24.2)
Private sector opportunities	78 (29.4)	134 (50.6)	53 (20.0)
I am looking for challenging specialty	85 (32.1)	95 (35.8)	85 (32.1)
I would like to have a long-term relationship with my patients	67 (25.3)	118 (44.5)	80 (30.2)
I had a personal experience that stimulated my influence in this specialty	65 (24.5)	114 (43.0)	86 (32.5)
I prefer to treat emergency cases	102 (38.5)	102 (38.5)	61 (23.0)
I prefer to treat non urgent cases	88 (33.2)	106 (40)	71 (26.8)
I would like to see a narrow group of patients with specific problems	85 (32.1)	94 (35.5)	86 (32.5)
I would like to treat patients in the wards	79 (29.8)	127 (47.9)	59 (22.3)
I would like to focus on treating patients in clinics	75 (28.3)	136 (51.3)	54 (20.4)
I don't want to have a direct interaction with patients	77 (29.1)	39 (14.7)	149 (56.2)
I want to treat less complicated patients	94 (35.5)	54 (20.4)	117 (44.2)

Table 4: Preferred future specialty by gender.

Future specialty	Male	Female	Total
Anesthesiology	1	3	4
Cardiology	6	1	7
Cardiothoracic surgery	10	16	26
Dermatology	3	19	22
Dietetics	0	1	1
Emergency medicine	2	1	3
Endocrinology	2	2	4
Family medicine	1	3	4
Gastroenterology	7	2	9
General surgery	12	14	26
Internal medicine	21	20	41
Nephrology	1	0	1
Neuro-medicine	4	3	7
Neurosurgery	9	8	17
Not decided yet	2	0	2
Gynecology and obstetrics	1	21	22
Oncology	0	1	1
Ophthalmology	1	6	7
Orthopedic surgery	6	2	8
Pediatrics	5	12	17
Pathology	3	3	6
Plastic surgery	2	2	4
Psychiatry	2	6	8
Pulmonology	3	1	4
Radiology	2	3	5
Urology	3	0	3
Total	161	223	384

There is significant association between gender differences and future specialty with p value of 0.006 by chi square. Among all the preferred future specialties, Gynecology and Obstetrics were highly female-dominated field (n=21) followed by Dermatology (n=19). Gastroenterology (n=7) and Cardiology (n=6) were highly preferable fields by males as shown in Table 4. The multinomial model was significant (likelihood-ratio χ^2=66.68, df=40, p=0.005; Nagelkerke R^2=0.171); academic year was associated with specialty preference, whereas age, gender and GPA were not independent predictors.

DISCUSSION

This cross-sectional study of 384 MBBS students and house officers provides the data of specialty preferences and the factors that effects in a choosing career among medical colleges of Punjab. Most of the students in survey were females (58.1%) consistent with previous study.[17] Majority of the students said to proceed in clinical sciences rather than basic sciences in consistent with previous study.[17] Most students opted for careers in medical specialties, while surgery was the second-most frequently chosen discipline. This is consistent is various regional studies done in Pakistan.[13,18,19]

A similar study conducted among sixth-year medical students in Jordan revealed that over half of them favored medical specialties.[20] A similar study conducted among sixth-year medical students in Jordan revealed that over half of them favored medical specialties.[1] There is also a research conducted in Gujrat, India in 2022 by Chikitsa Amin among 700 students and it showed similar results where medicine was preferred by 24.7% people followed by surgery preferred by 10.7% students.[21] Furthermore, a study from Saudi Arabia also indicated that internal medicine was the most commonly chosen specialty.[22] The study in contrast with these results was done by Nabila, Mann-issa et al in Bahrain. It showed 26.5% chose surgery as their most preferred specialty, followed by medicine(14.5%).[23] This contrast is may be due to regional differences. Majority of the MBBS students has

selected the specialty of their choice during clinical years of study consistent with previous study done by Khamees et al.[24] This was further supported by a study that found a statistically significant association, showing that students in the clinical phase were more likely to choose their future specialty than those in the basic science phase.[25] General practice was the least preferred specialty among our students, with similar trends reported in studies from Saudi Arabia and Jordan.[24,26]

0.8% of students have not decided their future specialty yet. Ahmed Alawad et al and Ossai et al reported higher results with 10.4% and 11.6% respectively.[4,27] While Rawan Al-Fouzan et al found that the majority of students (62.8%) were still undecided about their future specialty choice.[25] The possible explanation is that most of final year students in our survey who have decided their future specialty. There was significant association between gender differences and future specialty in our study. The strong preference among females for Gynecology and Obstetrics is consistent with findings from Germany where significantly more female students considered careers in Gynecology and Obstetrics.[29]

Similar gender-linked preferences in Latin America, where women were prevalently choosing Obstetrics/Gynecology.[30] The reasons include greater interest in areas of medicine involving female reproductive health among women, social comfort, or prior exposure during clinical rotations. Gastroenterology was highly preferable fields by males. This finding is consistent with literature showing that males tend to choose procedure-oriented internal medicine subspecialties.[31] Regarding dermatology, in our study, only 5.73% preferred dermatology as their future specialty. A Study in Kuwait reported that 3.47% had chosen dermatology as a future specialty.[25] Another study in Syria reported that 6% of the students preferred a future career in dermatology.[32]

In our study, the more attractive factors were the influence on patient's lives consistent with previous study followed by clinical diagnostic skills.[24] A study in Saudi Arabia reported that the potential for patient interactions was the most significant factor for choosing a specialty.[5] A study in Jordan reported that the intellectual content of the specialty was a primary factor.[33] Good treatment outcomes for patients were one of the important reasons for choosing a future specialty reported by Rawan Al-Fouzan et al.[25] While Alshahrani et al found that lifestyle was the main factor among Saudi medical student.[26] Several studies have shown that female students' specialty choices are more strongly influenced by factors such as on-call schedules, emphasis on urgent care, and community health, whereas male students place greater importance on the intellectual content of the specialty, their perceived competencies, and the expected financial rewards.[7,33]

This study has few limitations. It is a cross-sectional design with no causation and convenience sampling that limits generalizability. The self-reported measures in the study are susceptible to recall bias. In addition, the study did not explore other potential influences such as socioeconomic background, mentorship, or family expectations, which may also play a significant role in specialty choice. Because the study used online convenience sampling and responses came from selected colleges in six cities, findings may not be fully generalizable to all medical trainees across Punjab.

CONCLUSION

In our cross-sectional survey, most participants preferred internal medicine. Specialty choice was significantly associated with gender: Gynecology and Obstetrics and Dermatology were predominantly selected by female students, while Gastroenterology and Cardiology were more frequently chosen by male students. Most MBBS students reported choosing their preferred specialty during the clinical years. The primary motivations were the desire to positively impact patients' lives and an interest in clinical diagnostic skills.

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