Review Article

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Medicine Versus Surgical Specialty Preferences among House Officers in Pakistan: A Multi-Center Cross-Sectional Study and a Literature Review

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Abstract

Background: Choosing a medical specialty is one of the most important decisions for young doctors. In addition to affecting their personal and professional lives, this choice has an impact on the healthcare system as a whole, influencing service delivery and personnel distribution. This study aims to understand the current specialty preferences of house officers in major Pakistani hospitals and to explore the key factors influencing their decisions. ***Methods:*** This is an observational multi-center cross-sectional study and literature review conducted in four major hospitals—Pakistan Institute of Medical Sciences (PIMS), Shifa International, Holy Family, and FAUJI Foundation—between June and July 2025. Data collection employed a self-administered questionnaire via Google Forms. Descriptive analysis and a binary logistic regression model were used to summarize the findings. ***Results:*** Among the 180 house officers surveyed in Pakistan, internal medicine was the most desired specialty, chosen by 43.9% of participants. This was followed by general surgery (32.2%) and pediatrics (7.2%). The most common reported factor contributing to the specialty choice was passion, 117 (65.00%). Regarding preference rates for medicine versus surgery, gender, the presence or absence of a role model, and consistency in decision-making were statistically significant predictors. ***Conclusion:*** The most sought-after specialty among Pakistani house officers was internal medicine. A strong focus on specialization was driven by passion, gender, and role models.

Keywords: ***Speciality preferences, house officers, Motivation, Medicine.***

Introduction

The transition from medical school to working life is both thrilling and stressful [1]. The house job phase is an important year of clinical experience under supervision, preceding the start of independent practice as a physician [2]. It involves intense study, extensive hours, and–most importantly–important career decisions for early career providers [3]. Choosing the right post-graduate training pathway is one of the most critical decisions in a career path. In addition to affecting their personal and professional life, this choice has an effect on the healthcare system as a whole, affecting service delivery and personnel distribution [4].

Understanding the contributing factors behind specialization decisions can help inform policy changes in the Pakistani healthcare system [5]. Personal enthusiasm, mentorship, perceived work-life balance, and even expectations from family and society can all be important factors. The future of medical practice is shaped by these factors, which highlight the necessity of local data to inform policy and planning [6].

This study aims to understand the current specialty preferences of house officers in major Pakistani hospitals and to explore the key factors influencing their decisions. We intend to provide insightful information that can help support the healthcare system efforts in promoting a more responsive and balanced healthcare workforce by early addressing the challenges facing early-career physicians.

Literature review

Globally, medical students frequently gravitate toward specialties such as internal medicine, surgery, and pediatrics, driven by factors such as prestige, clinical experience, and opportunities for long-term

career growth, which are among the most commonly reported determinants of specialty choice [7].

In Pakistan, several recent studies have investigated this trend in detail. Zia *et al*. (2017), a multicenter study conducted among medical graduates in Pakistan, revealed that factors including personal interest, expected income, work-life balance, and mentorship predominantly shape specialty selection. Notably, they indicated that surgery and internal medicine were among the most favored specialties [8]. In Shakir *et al*. 2024, the impact of medical school exposure on promoting interest in surgical specialties, particularly neurosurgery, has been highlighted [9]. Likewise, Idrees *et al*. 2024 conducted a comprehensive nationwide study. It was observed that perceptions of workload, limited training spots, and long residency programs led many house officers to reconsider their initial specialty preferences [10]. These findings highlight the dynamic nature of career choice during the internship period.

Other investigations focused on the broader distribution of preferences. In Balouch *et al*. 2022, we observed that internal medicine, general surgery, and pediatrics were the most sought-after specialties among junior doctors in Pakistan, while basic sciences and family medicine were rarely selected [11]. Their study also raised concerns over "brain drain", where many skilled professionals pursue training and careers abroad due to limited opportunities and dissatisfaction with the local system. Other multicenter data from Karachi show surgery and medicine dominating preference, with public health, ophthalmology, and psychiatry among the least chosen specialties [12]. In Lahore 2023, postgraduate trainees and final-year students again preferred general surgery, pediatrics, and medicine, motivated by salary, workload, and a sense of social responsibility [5]. The study also highlighted that salary expectations, work-life balance, and mentorship from senior doctors were key factors influencing these choices.

Gender-based and socio-cultural factors also influence career decisions. For instance, in Pakistan, women more often preferred pediatrics and obstetrics/gynecology (OB/GYN) [13], consistent with broader findings that women globally tend to choose specialties like pediatrics, OB/GYN, and dermatology for work-life balance and family support [14]. On the other hand, men leaned toward surgery and internal medicine due to perceived status and earning potential. These disparities are further affected by institutional support and the availability of mentorship during clinical years.

Despite existing efforts, data on specialty choices among Pakistani house officers is still unclear. As for our knowledge goes, no previous study investigates the specialty preferences in major Pakistani hospitals in major cities like Islamabad and Rawalpindi. This study builds on previous work by exploring preferences across major hospitals in major cities, considering both individual motivations and systemic influences.

Methods

Settings & Design

This is an observational multi-center cross-sectional study that investigates the preferences of specialities among house officers in Pakistan and the influencing factors. The study was conducted in four major hospitals–Pakistan Institute of Medical Sciences (PIMS), Shifa International, Holy Family, and FAUJI Foundation–between June and July 2025.

Outcomes measurement

Our primary outcomes are the specialty of interest, factors influencing the choice. Secondary outcomes include participants' demographics, the Influence of guidance, having a physician parent or a role model on specialty choices.

Population and Sampling

We have included participants if they were (1) house officers. (2) taking house job in PIMS, Shifa International, Holy Family, and FAUJI hospitals. We have excluded medical students and hospital residents.

We used a convenience sampling method, and the sample size was calculated using OpenEpi [15]. We used a 95% confidence interval, a 5% margin of error, a design effect of 1, and an anticipated frequency of 14%, based on a similar study conducted in Karachi [16]. The required sample size was 180.

Data Collection

Data collection employed a self-administered questionnaire via Google Forms. We shared the form in morning meetings, ward rounds, academic sessions, and online forums commonly used by house officers. We adapted the questions from a previous study [17] and made cultural adaptations to suit the Pakistani context. The survey question was divided into three sections: socio-demographic data, specialty preferences, and factors considered in choosing a specialty. The survey tool has been included as a supplemental file.

Data Analysis

Descriptive analysis was used to present frequency and percentages. A binary logistic regression model was used to assess the factors influencing specialty preferences (Specialties included in the model were internal medicine and Surgery). Variables included in the adjusted model are included in Table 2. Demographic characteristics were used as factors. P-value < 0.05 is considered statistically significant. Statistical Package for Social Sciences (SPSS) version 26 [18] was used to analyse the data.

Ethical consideration

The Research Ethics Committee of PIMS hospital granted the study's ethical approval, ensuring compliance with ethical guidelines and standards for research involving human participants. Informed consent was obtained from all individuals before their voluntary completion of the questionnaire. All methods were performed in accordance with the Declaration of Helsinki [19].

Results

The total number of valid responses included in the analysis was 180. Among them, 99 (55.00%) were women. The majority of the respondents, 159 (88.33%), were single. Almost half of the responses were received from PIMS Hospital, 87 (48.30%). Most respondents, 172 (95.60%), had completed their MBBS in Pakistan and intended to pursue specialist training. 97 (53.90%) of the participants prefer to specialize outside Pakistan. 19 (10.60%) of the participants had parents who were physicians, and 112 (62.20%) had a doctor role model. Table 1 summarizes the respondents' answers to the questionnaire.

Analysis of the specialty preferences revealed that internal medicine was the most desired, with 79 participants (43.90%) reporting it as their specialty of choice. followed by general surgery, 58 (32.20%), and pediatrics, 13 (7.2%). Family medicine was the least preferred specialty 4 (2.20%) (**Figure 1**).

Only 58 (32.20%) of respondents had career guidance during medical school, while 111 (61.70%) had researched their chosen specialty. Most respondents, 75 (41.70%), chose a career during their clinical rotations. More than half of the respondents, 109 (60.60%), had a different choice earlier (**Table 1**). Figure 3 shows the factors that made participants change their choice.

The most common reported factor contributing to the specialty choice was passion, 117 (65.00%). This indicates that doctors are mainly motivated by their passion to choose their career pathway. Fifty-nine (32.80%) reported enjoying clinical posting in school/house job as a contributor to their choice. Figure 2 demonstrates the factors contributing to specialty choice reported by the participants.

The binary logistic regression model showed that gender was a statistically significant predictor of specialty preferences. The crude odds ratio (OR) for women choosing internal medicine over surgery was 3.95(95% CI: 1.93-8.11, p = 0.00), and the adjusted OR was 8.54(95%CI:1.81 -40.28, p =0.01). Adjusted variables are mentioned in Table 2.

Participants without a physician parent may be less likely to prefer internal medicine over surgery (crude OR = 0.28, 95% CI: 0.08-1.02, p = 0.054). However, this association didn't reach statistical significance; it may suggest a need for further investigation.

Having an internal medicine model was significantly linked to an increased likelihood of choosing internal medicine over surgery. (crude OR = 33.79, 95% CI: 10.37-110.06, p = 0.00) (adjusted OR=89.68, 95% CI:14.98-537.01, p = 0.00). Likewise, those who had no role model at all had significantly higher odds of preferring internal medicine. (crude OR = 6.68, 95% CI: 2.2220.08, p = 0.00). Compared to surgery, those who had not altered their mind about their intended specialty were much more likely to choose internal medicine. (adjusted OR = 10.81, 95% CI: 1.05-111.78, p = 0.05). This implies that a preference for internal medicine may be linked to consistency in decision-making. Table2. The model demonstrated a humbled fit, with a p-value of 0.00 and Nagelkerke R^2 = 0.70. Additionally, the percentage accuracy in classification (PAC) was 57.70%.

Table 1: Summary of participants' responses to the questionnaire(N=180).

Gender N(%)	Men 81(45.00%), Women 99(55.00%)
Martial status N(%)	Single 159(88.33%), Married 21(1.70%)
Hospital of house job N(%)	PIMS 87(48.30%), Holy Family 31(17.20%), FUJI 33(18.30%), AlShifa 29(16.10)
MBBS country N(%)	Pakistan 172(95.60%), Kyrgyzstan (2.80%), China 2(1.10%), Kazakhstan 1(0.56%)
Do you intend to pursue specialist training? N(%)	Yes 172(95.60%), No 3(1.70%), Undecided 5(2.80%)
Preferred country of practice N(%)	Pakistan 83(46.10%), Outside Pakistan97(53.80%)
Is any of your parent a physician? N(%)	Yes 19(10.60%), No 161(89.40%)
Do you have a doctor role model? N(%)	Yes 112(62.20%), No 68(37.80%)
Did you have any career guidance in school? N(%)	Yes 58(32.20%), No 122(67.80%)
Have you researched on your preferred specialty? N(%)	Yes 111(61.70%), No 69(38.30%)
When did you decide on the choice of specialty? N(%)	Before medical school 21(11.70%), During preclinical period 16(8.90%), During clinical rotations 75(41.70%), During housejob 51(28.30%), Undecided 15(8.30%), I don't intend to specialize 2(1.10%)
Did you have a different choice earlier? N(%)	Yes 109(60.60%), No 7(39.40%)

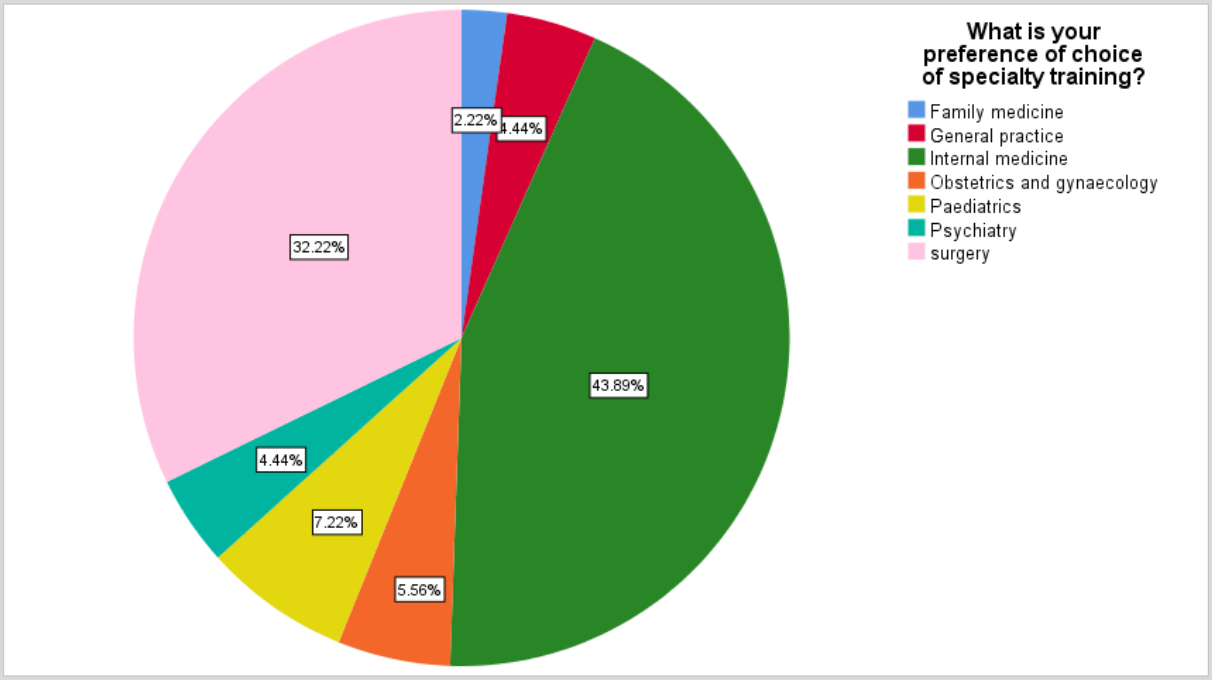

Figure1: Speciality preferences among the participants(N=180)

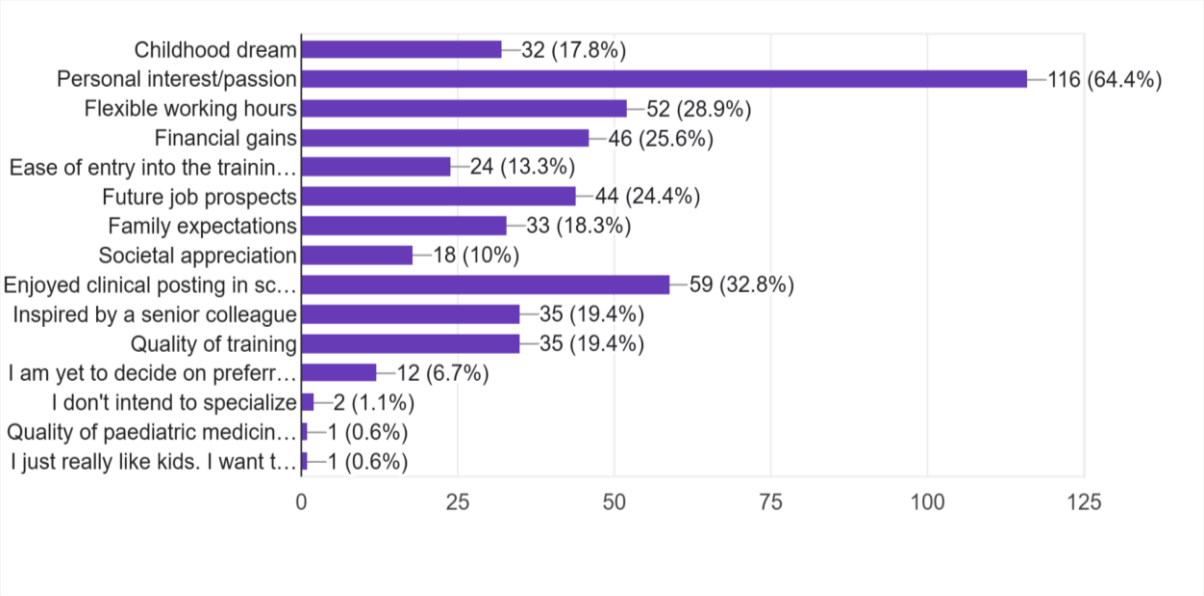

Figure 2: Factors contributing to specialty choice reported by the participants(N=180).

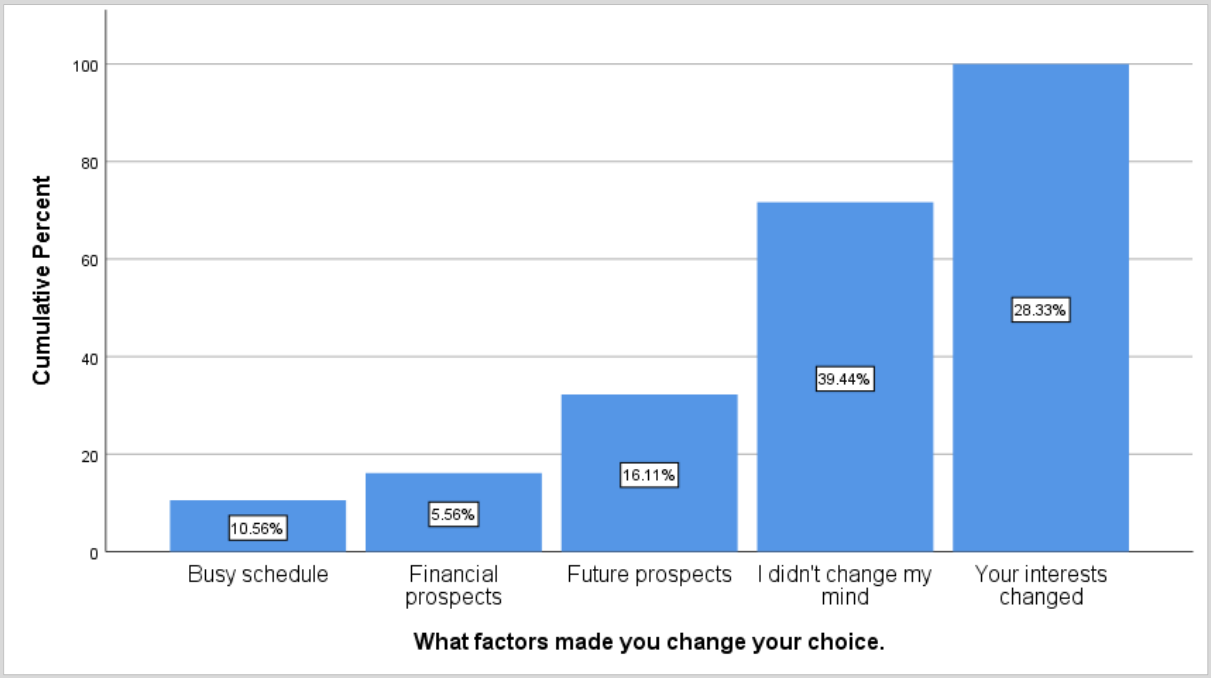

Figure 3: Factors considered in changing the mind about the specialty choice(N=180).

Table 2: Crude and adjusted OR (95%CI) for speciality choices among respondants (n=137)

Factor	Crude OR (95%CI)	p value	Adjusted OR (95%CI)	P value
Gender				
Men	Ref.		Ref.	
Women	3.95(1.93-8.11)	0.00	8.53(1.81-40.28)	0.01
Marital status				
Single	Ref.		Ref.	
Married	0.80(0.29-2.23)	0.674	0.56(0.09-3.75)	0.55
Is any of your parent a physician?				
Yes	Ref.		Ref.	
No	0.28(0.08-1.02)	0.054	0.77(0.05-12.06)	0.85
Hospital of House Job				
PIMS	Ref.		Ref.	
Alshifa	1.94(0.73-5.17)	0.19	1.22(0.21-7.19)	0.83
FUJI	2.63(0.97-7.13)	0.06	1.92(0.33-11.32)	0.47
Holy Family	0.97(0.38-2.48)	0.95	0.20(0.02-1.79)	0.15

Country of MBBS (for house officers who schooled abroad)				
Pakistan	Ref.		Ref.	
Outside Pakistan	1.49(0.26-8.44)	0.65	0.92(0.06-15.44)	0.95
Do you intend to pursue specialist training				
Yes	Ref.		Ref.	
No	-		-	
Undecided	1.5(0.13-16.95)	0.74	2.04(0.02-285.09)	0.78
Preferred Country of Practice				
Pakistan	Ref.		Ref.	
Outside Pakistan	1.35(0.68-2.68)	0.39	1.11(0.28-4.46)	0.88
Did you have any career guidance in school?				
Yes	Ref.		Ref.	
No	0.55(0.26-1.17)	0.12	0.42(0.09-1.9)	0.26
Have you searched on your preferred specialty?				
Yes	Ref.		Ref.	
No	1.00(0.49-2.01)	0.99	0.39(0.08-1.77)	0.22
When did you decide on the choice of specialty?				
Undecided	Ref.		Ref.	
Before medical school	0.44(0.08-2.39)	0.35	0.11(0.01-2.15)	0.14
During clinical rotations	0.33(0.08-1.36)	0.13	0.27(0.02-4.33)	0.35
During housemanship	0.39(0.09-1.64)	0.19	0.59(0.03-11.66)	0.73
During preclinical period	3.33(0.29-38.08)	0.33	4.81(0.14-165.00)	0.38
I don't intend to specialize	-		-	
Did you have a different choice earlier?				
Yes	Ref.		Ref	
No	1.44(0.71-2.89)	0.31	0.48(0.07-3.44)	0.46
What factors made you change your choice?				
Your interest changed	Ref.		Ref.	
Busy Schedule	2.68(0.78-9.19)	0.12	2.86(0.38-21.74)	0.31
Financial prospects	1.12(0.24-5.18)	0.89	1.22(0.09-16.29)	0.88
Future prospects	1.45(0.51-4.16)	0.49	6.01(0.69-51.63)	0.10
I didn't change my mind	1.84(0.78-4.35)	0.16	10.81(1.05-111.78)	0.05
Do you have a doctor role model?				
Yes	Ref.		Ref.	
No	1.00(0.49-2.01)	0.99	2.09(0.38-11.50)	0.39
What specialty is he/her?				
Surgery	Ref.		Ref.	
Anesthesia	-		-	
Emergency specialist	-		-	
ENT	-		-	
Family medicine	4.71(0.26-84.76)	0.29	5.01(0.13-196.39)	0.39
General practitioner	-		-	
Internal medicine	33.79(10.37-110.06)	0.00	-	
Don't have a model	6.68(2.22-20.07)	0.00	89.68(14.97-537.01)	0.00
Obstetrics and gynecology	-		5.57(0.86-36.09)	0.07
Oncology	-		-	
Ophthalmology	-		-	
Paediatrics	-		-	
Psychiatry	4.71(0.26-84.77)	0.29	8.81(0.13-579.23)	0.31

Discussion

Among the 180 house officers surveyed in Pakistan, internal medicine was the most desired specialty, chosen by 43.9% of participants. This was followed by general surgery (32.2%) and pediatrics (7.2%). Family medicine was the least preferred specialty, with only 2.2% of respondents choosing it. Regarding preference rates for medicine versus surgery, gender was a statistically significant predictor. Women were more likely to choose internal medicine over surgery compared to men. A key trend observed in gender preferences was that women were significantly more inclined towards internal medicine than surgery. Additionally, over half of the respondents had a different specialty choice earlier in their academic journey, indicating evolving preferences. Results indicate that a significant proportion of the house officers surveyed had a doctor role model, with 112 out of 180 respondents reporting having one. The presence and specialty of a role model were found to be statistically significant predictors of specialty preferences.

The findings from Pakistan show that internal medicine and general surgery are among the most desired specialties, which is consistent with reports from India and Syria [20]. In Karachi,

Pakistan, internal medicine (15.1%), cardiology (10.6%), pediatrics (10.3%), and general surgery (9.0%) were among the highest-ranked specialties [21]. Similarly, in Syria, general surgery (27.6%) and internal medicine (23.5%) were the two most common choices [22]. A systematic review covering studies from 2010 to 2020 also found that surgery and internal medicine were the most wanted specialties globally, in both "occidental and non-occidental countries" [23,24].

While this study indicated women were more likely to choose medicine over surgery, another Pakistani study noted a shift in the trend of women towards surgery and internal medicine rather than gynecology, suggesting increasing competition in surgical fields in the future [25]. In Japan, women significantly preferred pediatrics, obstetrics & gynecology, and psychology, while men significantly preferred surgery and orthopedics [28]. Similarly, in Syria, women preferred "other specialties" (which included dermatology, ENT, ophthalmology, radiology, anesthesiology, pathology, laboratory medicine, emergency medicine, psychiatry, and family medicine), internal medicine, and surgical specialties, while men primarily chose surgical specialties and internal medicine [30].

In this study, passion/interest was the most common factor reported for specialty choice in Pakistan, which was "passion" (65%). Similarly, in Syria, "A specialty that I like and find interesting" was the most common factor affecting choice for both genders (74% women, 71% men) [27]. India also identified "interest in the specialty" as a highly important factor [20].

Our study reveals that enjoying clinical posting/past work experience is one of the most common. Almost 32.8% of Pakistani participants who reported enjoying clinical postings in school/house jobs as a contributor to their choice. In Switzerland, the "experiential factor" was particularly influential for choosing Obstetrics and Gynecology (OBGYN) [24]. This aligns with findings that clinical placements and experiences gained during undergraduate training are important in specialty choice [29].

Work-life balance and lifestyle were identified as the main factors influencing specialty choice globally. In the UK, work-life balance was a critical factor in decisions regarding emigration and leaving the profession [29]. Syrian women were more likely to choose work-life balance as a significant factor, correlating with their preference for fewer working hours [27]. Japanese students also associated "work-life balance" with a preference for "controllable lifestyle specialties" and psychology, and negatively with emergency medicine [22]. For medical students in India, "flexible working hours," "less stressful working conditions," "less duration of work hours," and "comfortable lifestyle" were grouped under "personal growth" factors influencing career preferences [20].

Financial prospects/salary was noted as a factor that made Pakistani participants change their specialty choice. In India, "financial prospects" were a component of "professional growth" factors. For Syrian men, "anticipated income" was the second most common influencing factor (67%) [20]. "Good salary" was also a main reason for specialty choice for both genders in another Pakistani study [25].

We found that future prospects/career prospects played an important role in Pakistani house officers changing their specialty choice. In Syria, "better work opportunities after specializing" influenced 69.1% of students' decisions [22]. In Malaysia, "overall work experiences and career prospects" were among the most important motivators. India also noted "opportunities for higher studies or further specialization" as part of "professional growth" [20].

Having a role model was significantly associated with specialty choice in Pakistan. Specifically, a role model in internal medicine was linked to lower odds of choosing surgery over medicine. Participants with no role model also showed significantly reduced odds of choosing surgery [28]. India also identified "influenced by role models" as a factor within "personal satisfaction" [20].

In our study, 10.6% of house officers had parents who were physicians. Participants without a physician parent may be more likely to prefer surgery over medicine, though this didn't reach statistical significance. In India, the presence of a relative in the health professions influenced motivational patterns and preferences, with these students being less likely to prefer rural service [20]. For pharmacy students in KSA, family influence (66.6%) was a main reason for studying pharmacy [29]. In Karachi, Pakistan, 84.7% of subjects cited "prestige in working in that field" as a reason for their choices [21]. In India, "perceived status of the field" was a factor [20].

Family medicine was the least preferred specialty (2.2%) among Pakistani house officers. According to an Indian study, only a few specialties are highly preferred by students, and 37.5% of students don't realize there are other options available [20].

The strong preference for internal medicine and general surgery in Pakistan could lead to saturation in these popular specialties, potentially creating imbalances in the health workforce across different professions and specialties. This necessitates strategic workforce planning to ensure that the skill mix and clinical practice meet population health needs.

The consistent finding that family medicine is the least preferred highlights a significant gap. Coupled with the observation that many students are unaware of available specialty options, this points to a critical need for:

- Promotion of underrepresented specialties: Medical schools and policymakers need to devise more appealing strategies for "inspiration and attracting talent" to lesser-known fields.
- Structured career orientation programs: These programs should be integrated into the curriculum to inform students about the scope and realities of various specialties, helping them make informed choices that align with their interests and abilities.

Furthermore, the significant proportion of participants who prefer to specialize outside Pakistan (53.9%), combined with similar trends in the UK (32.35% intend to emigrate) [29], Malaysia (27.1% plan to emigrate after house job, although most plan to return) [31], and Syria (78.7% interested in specializing abroad), suggests a potential "brain drain" and a critical challenge for national healthcare systems [27]. Factors such as remuneration, work-life balance, and working conditions are key drivers for emigration [29]. Addressing these issues is crucial for the retention of doctors and effective workforce planning [32]. Declining physician work hours, particularly in the US, also impact workforce capacity and highlight the need for careful planning [33].

In this study, we found that only 32.2% of respondents had career guidance during medical school, although 61.7% had researched their chosen specialty. This suggests a gap in formal support for career decision-making. A major concern is the high prevalence of career regret and low mental quality of life (QoL) among medical students in some regions. In Jordan, 76.3% of medical students expressed regret about studying medicine, with stress being the main reason. This figure is alarming and significantly higher than in developed countries. The mental health scores (MCS) were lower in students who frequently or always considered dropping out of medical school. Overall, medical

students have a lower QoL than the general population and often exhibit depressive symptoms. In the UK, only 17.26% of surveyed students were satisfied or very satisfied with the overall prospect of working in the National Health Service (NHS), with considerable variation between institutions [29]. In Malaysia, only 37.8% were optimistic about a career with the Ministry of Health (MOH) in the future [31].

Limitations

Our study, as a cross-sectional design, cannot establish causal relationships between factors and specialty choice. There was a lack of longitudinal data, so we cannot track changes in individual preferences over time or confirm actual career choices after graduation. Limited Geographical Representation, our result specifically mentions that almost half of the responses came from PIMS Hospital.

Recommendations

Based on these findings, several recommendations emerge for healthcare policymakers and medical school leadership:

Implement Structured Career Guidance Programs: Given that only 32.2% of Pakistani respondents had career guidance, medical schools should introduce structured career orientation programs early in the curriculum. This will help students make informed choices that align with their interests and abilities.

Promote Underrepresented Specialties: Strategies are needed to increase awareness and interest in less preferred specialties like family medicine and other specific underrepresented fields. Policymakers should adopt appealing strategies to attract talent to these areas.

Address Work-Life Balance and Working Conditions: Critical factors influencing career choices and emigration intentions include remuneration, work-life balance, and overall working conditions. Systematic improvements in the working environment are necessary to encourage doctors to stay within national healthcare systems. This includes addressing issues like busy schedules, financial prospects, and future career uncertainties.

Advocate for Gender Equity: Policymakers should actively advocate for a culture of gender equity and develop educational programs and recruitment plans to ensure a balanced distribution of physicians across different specialties, challenging existing gender segregation and promoting equal opportunities for professional advancement.

Strengthen National Healthcare Systems: Urgent government interventions are needed to address factors contributing to the potential exodus of future doctors to prevent further straining of healthcare systems. Better forecasting models are also necessary to anticipate changes in the demographics of nurses and plan hiring needs more effectively.

Conclusion

This study confirms Pakistani house officers primarily favor internal medicine and general surgery, largely influenced by passion, gender, and role models. Over half of these students intend to specialize abroad, indicating a significant brain drain and an urgent need for better local opportunities. Achieving this imbalance requires strategies such as career guidance, promoting less-preferred specialties, and improving work-life balance to retain talent. These findings underscore the necessity for policymakers to proactively foster a motivated and equitably distributed healthcare system.

Statements and Declarations

Authors contribution

Conceptualization: Maha Abu Zarifa, Formal analysis and investigation: Maha Abu Zarifa, Data collection: All authors, Writing - original draft preparation: All authors; Supervision: Hazem Ayesh. All authors approved the final manuscript.

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Competing Interests

The authors have no competing interests to declare that are relevant to the content of this article.

Data Availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Consent to Participate

Informed consent was obtained from all individual participants included in the study.

Consent to Publish

NA

Clinical Trial Number

Not applicable

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