



Original Article

Exploring Specialty Selection and Influencing Factors among Medical Students and Postgraduates: An Observational Study

Muhammad Maaz Arif¹, Wardah Nisar², Khadija Agha³, Muzammil Ghaffar Qureshi³, Amen Mansoor³, Asad Ullah Malik³, M. Sohaib Khokhar³, Fatima Awan³, Sarah Irfan Khwaja³ and Aqsa Parveen³¹Department of Medical Education, University of Health Sciences, Lahore, Pakistan²Department of Public Health, University of Health Sciences, Lahore, Pakistan³FMH College of Medicine & Dentistry, Lahore, Pakistan

ARTICLE INFO

Key Words:

Postgraduate Trainees, Pediatrics Medicine, General Surgery, General Medicine

How to Cite:

Arif, M. M., Nisar, W. ., Agha, K. ., Qureshi, M. G. ., Mansoor, A. ., Malik, A. U. ., Khokhar, M. S. ., Awan, F. ., Khwaja, S. I. ., & Parveen, A. . (2023). Exploring Specialty Selection and Influencing Factors among Medical Students and Postgraduates: An Observational Study: Specialty Selection and Influencing Factors among Medical Students. *Pakistan Journal of Health Sciences*, 4(06). <https://doi.org/10.54393/pjhs.v4i06.803>

*Corresponding Author:

Muhammad Maaz Arif
Department of Medical Education, University of Health Sciences, Lahore, Pakistan
maazarifbutt@gmail.comReceived Date: 29th May, 2023Acceptance Date: 24th June, 2023Published Date: 30th June, 2023

ABSTRACT

Medical students are driven by interest and influenced by factors like early exposure, training, environment, teaching, role models, rewards, appreciation, patient feedback, and mentorship. Gender also impacts specialty choices. Students' career choices shape the future workforce.

Objective: To explore interests and factors influencing specialty choice among post graduate trainees and final year students, aiming to guide informed career decisions and address inadequate recruitment in specialties. **Methods:** This study was an observational cross-sectional study conducted at Fatima Memorial Hospital and college. Data were collected from 163 participants via online questionnaire using non-convenience sampling. Analysis was conducted using SPSS software, including frequencies, percentages, averages and t-test to assess statistical significances. **Results:** Study finds strong preference for clinical subjects among final year and postgraduate students. Divergence among specialty selection was seen as final year students favor general surgery, while postgraduate trainees lean towards pediatrics medicine. Prestige and social responsibility were common influential key factors, with salary benefits impacting more the final year students and specialty prestige, social responsibility and research opportunities weighing on postgraduate trainees were seen. The research also explores that family influence for final year students and teachers and senior doctors for postgraduate trainees in specialty selection. **Conclusions:** In conclusion, final year and postgraduate trainees prefer clinical specialties like general surgery and pediatrics, driven by considerations of future salary, working hours, and social responsibility. Family, teachers, and senior colleagues play crucial roles in specialty selection decisions.

INTRODUCTION

Students enter the medical field with varied intentions, but the primary drivers are their genuine interest and compassion for the sick. Career choices are influenced by pre-med inclinations, training experiences, social milieu, teaching programs, role models, material rewards, societal appreciation, patient response, and mentor influence [1]. Studies indicate that individuals tend to favor specialties aligned with their gender roles. Women tend to gravitate

towards pediatrics and gynecology-obstetrics, while men often choose surgical fields [2]. Postgraduate specialization choices have a profound impact on the availability of doctors in various fields. It is crucial for medical students to carefully consider their specialty selection, as it determines the future distribution of healthcare professionals. Opting for a well-planned specialty that aligns with their interests allows

postgraduates to invest their time, training, and financial resources effectively. On the other hand, making an uninformed decision can result in wasted time, resources, decreased motivation, frequent specialty changes, and even individuals leaving the medical profession altogether. A thoughtful choice ensures a better utilization of human potential and leads to long-term success [3]. Medical specialization choices are influenced by various factors, including personal preferences. Younger individuals tend to be more optimistic. They have more time to dedicate to their careers. In contrast, older individuals may have various responsibilities and other familial obligations that can impact their specialization choices [4]. Gender norms in Pakistan limit women's professional lives, leading many to become housewives. This greatly impacts medical specialization choices, with men favoring demanding surgical careers and women seeking specialties with fewer duty hours and lighter workloads [5]. Personality influences career choices. Those who have a natural affinity for children may lean towards becoming pediatricians instead of surgeons. Some individuals may be inspired by a psychiatry professor and choose psychiatry as their role model. Others may be impressed by figures like Sigmund Freud and opt for neurology [6]. Income is another important factor; some people choose a financially highly paid specialty rather than taking care of if they can perform well and can commit to the hard work required along [7]. Undergraduate curriculum, house job experiences, job availability, parental influence, and prestige are key factors guiding medical specialization choices for Pakistani students and postgraduates [8]. Personal health is a crucial factor influencing the choice of medical specialization for postgraduate residents (PGRs). Specialties like gynecology, with high job pressure, may not be suitable for individuals with health concerns. Dermatology and radiology, which typically involve less work burden, offer better opportunities for maintaining a satisfying family life [9]. In different regions of a country, the effects of various factors are different depending on the employment opportunities and specific mindsets and requirements [10]. In resource-poor settings with a low doctor-to-population ratio, achieving an equitable distribution of the healthcare workforce is crucial [11]. Similarly, becoming proficient and skilled in a particular medical specialty requires a substantial investment of time, effort, and financial resources. Consequently, the effectiveness of the selection process becomes crucial [12]. Matching inclination and true passion prevent premature career termination, provides guidance to students and young doctors, aligns aspirations with societal needs. Improper selection leads to specialty changes, dropouts, and career abandonment [13].

Motivations and experiences, both before and during medical school, shape career decisions [14]. Residents often enter medical school with a specific interest in a medical field. However, imbalances in specialist numbers can pose challenges. Medical educators should educate and motivate students about specialty choices. Post-graduate specialization is crucial for success due to competition for seats worldwide. Fresh graduates are versatile, but specialization makes them specialized. Students typically choose specialties before graduation with limited knowledge [15]. Students choose specialties based on various factors like working hours, passion, family responsibilities, income, and job prospects. In India, a study revealed that medicine and pediatrics are popular choices due to their higher pay. Several factors, including gender, working hours, cultural and social beliefs, influence students' career decisions [3]. We choose this topic to know about the interests, search the factors that influence the choice of specialty and to find out why some specialties are preferred over others by the postgraduate trainees and final year students. Certain important specialties fail to recruit a suitable number of postgraduate trainees and also alter the balanced distribution of seats. This can cause them to perform inadequately, and impact the favorable patient outcome and the future of that specialty as well. This study will also enable in development of interest in medical students about future choices and perhaps the guidance about the specialty they choose.

METHODS

The study design employed in this research was an observational cross-sectional study. It took place at Fatima Memorial Hospital and its affiliated institution, FMH College of Medicine and Dentistry. The study spanned approximately two months, during which data were collected and analyzed. As this study targeted a specific medical college, the population selected was from the FMH College of Medicine and Dentistry, Lahore which included Final year medical students and Postgraduates for year 2020. The estimated sample size for this study was 163 participants (95% CI and 6% ME). A non-convenient sampling technique was employed. The collection of data were conducted through an online questionnaire. The study included all eligible students and postgraduates who willingly participated and provided their consent. However, individuals who did not participate, give consent, or were affected by any mental ailment were excluded from the study. The data analysis was conducted using SPSS version 21.0. For qualitative variables such as gender and locality, frequencies and percentages were employed to present the data. Meanwhile, quantitative variables like age were analyzed by calculating averages and mean deviations to

provide a comprehensive understanding of the data distribution. To determine the statistical significance of the results, p-values were calculated using t-tests. These tests of significance helped to assess the strength of the associations and identify any meaningful relationships within the data. Ethical approval was taken from the institutional research board of FMH College of Medicine and Dentistry with IRB # FMH-09-2020-IRB-787-M, dated 16-09-2020.

RESULTS

The study included 75 final year students. Findings showed that most students preferred clinical subjects (70) over basic subjects (5). The male-to-female ratio was nearly equal (37:38). A majority came from middle-class families (68), while 7 were from upper-class families. Out of the 75 students, 44 were not from Lahore (Table 1).

Table 1: Demographic profile of Final year students

Variables	Category	Frequency
No. of Respondents	Basic Subjects	6
	Clinical Subjects	69
Gender	Males	37
	Females	38
Locality	Citizens (From Lahore)	31
	Non-Citizens (Not from Lahore)	44
Socio-economic Status	Upper	7
	Middle	68
	Low	0

Regarding specialty choices, 6 students opted for basic science, with 4 choosing behavioral science, 1 pathology, and 1 oncology. Among the students, 69 chose clinical subjects. Specializations selected were: general surgery (16), general medicine (11), gynecology (7, all female), Cardiothoracic surgery (5), pediatrics (5), psychiatry (4), cardiology (3), gastroenterology (2), nephrology (2), neurosurgery (2), dermatology (1), ENT (1), urology (1), neurology (1), orthopedics (1), rheumatology (1), and 2 students did not respond (Table 2).

Table 2: Choice of Specialty by Final Year Students

Clinical Medical Sciences		Basic Medical Sciences	
Choice of Specialty	Frequency	Choice of Specialty	Frequency
General Surgery	16	Behavioral Sciences	4
General Medicine	11	Oncology	1
Gynecology / Obstetrics	7	Pathology / Microbiology	1
Pediatrics Medicine	5	Anatomy / Histology	0
Cardio-thoracic Surgery	5	Biochemistry	0
Psychiatry	4	Community Medicine	0
Cardiology	3	Forensic Medicine	0
Gastroenterology	2	Medical Education	0
Neurology	2	Pharmacology	0
Neurosurgery	2	Physiology	0

Dermatology	1	Public Health	0
ENT	1	Not Answered	0
Eye	1		
Family Medicine	1		
Nephrology	1		
Orthopedics	1		
Pulmonology	1		
Radiology	1		
Rheumatology	1		
Urology	1		
Anesthesia	0		
Nuclear Medicine	0		
Pediatrics Surgery	0		
Plastic Surgery	0		
Not Answered	2		

Factors favoring specialty choice included prestige/status, potential for administration, salary benefits, research opportunities, social responsibilities, better working hours, opportunities in rural areas, and foreign job prospects. The main influences were family and role models, while friends, books, television, and media had less impact (Table 3).

Table 3: Factors for choosing a specialty by Final Year Students

Factors for Choice of Specialty	Yes (Frequency)	No (Frequency)
Specialty prestige/status	58	17
Potential for administration	52	23
Research opportunities	53	22
Salary packages and benefits	58	17
Better Working hours	55	20
Social responsibility	61	14
Family influence	43	32
Friends influence	20	55
Influence from a role model	45	30
Influence from television, books or media	34	41
Foreign job opportunities	46	29
Opportunities for serving in rural/ lower areas	53	22

According to the research, data were collected for 88 postgraduates. Most of them specialized in clinical subjects over basic subjects. There were more females than males, with a ratio of 42 to 46. Out of the total, 60 were from Lahore and 28 were not. The socioeconomic distribution was 8 from the upper class, 79 from the middle class, and 1 from a low socioeconomic background (Table 4).

Table 4: Demographic profiles of Postgraduates

Variables	Category	Frequency
No. of Respondents	Basic Subjects	26
	Clinical Subjects	62
Gender	Males	42
	Females	46
Locality	Citizens (From Lahore)	60
	Non-Citizens (Not from Lahore)	28

Socio-economic Status	Upper	8
	Middle	79
	Low	1

In terms of specialty choices, the data showed that 4 people chose anesthesia, 1 person chose cardiology, 1 person chose dermatology, 2 people chose ENT, 1 person chose eye, 1 person chose family medicine, 1 person chose gastroenterology, 9 people chose general medicine, 7 people chose general surgery, 9 people chose gynecology/obstetrics, 1 person chose nephrology, no one chose neurology, 1 person chose neurosurgery, no one chose nuclear medicine, 1 person chose orthopedics, 10 people chose pediatrics medicine, 1 person chose pediatrics surgery, 2 people chose plastic surgery, 2 people chose psychiatry, no one chose pulmonology, 1 person chose radiology, 1 person chose rheumatology, no one chose cardiothoracic surgery, no one chose urology, and 6 people did not answer (Table 5).

Table 5: Choice of Specialty of Postgraduates

Clinical Medical Sciences		Basic Medical Sciences	
Choice of Specialty	Frequency	Choice of Specialty	Frequency
General Medicine	10	Anatomy / Histology	6
Pediatrics Medicine	10	Community Medicine	4
Gynecology / Obstetrics	9	Behavioral Sciences	3
General Surgery	7	Biochemistry	3
Anesthesia	4	Pathology / Microbiology	3
ENT	2	Physiology	3
Plastic Surgery	2	Forensic Medicine	1
Psychiatry	2	Medical Education	1
Cardiology	1	Oncology	1
Dermatology	1	Pharmacology	1
Eye	1	Public Health	0
Gastroenterology	1	Not Answered	0
Nephrology	1		
Neurosurgery	1		
Orthopedics	1		
Pediatrics Surgery	1		
Radiology	1		
Rheumatology	1		
Family Medicine	0		
Neurology	0		
Nuclear Medicine	0		
Pulmonology	0		
Cardio-thoracic Surgery	0		
Urology	0		
Not Answered	6		

An interesting fact has come to light through this research, indicating that a noteworthy number of women in training have chosen to focus on gynecology and pediatrics. This suggests the likelihood of these fields being predominantly female-dominated in Pakistan. Among the respondents, excluding those who did not answer, 69 out of 82 people

were satisfied with their specialty choice, indicating a high percentage (84%) of happiness and satisfaction in their chosen field (Table 6).

Table 6: Satisfaction with specialty chosen by postgraduates

For Postgraduates (Only)			
Question	Number of those who are Satisfied	Number of those who are Not Satisfied	Not Answered
How many were satisfied with the job they chose?	69 (78.41%)	13 (14.77%)	6 (6.82%)

The research highlighted that factor such as specialty prestige and potential for administration greatly influenced students' choice of specialty. Medicine is considered a noble profession, and despite challenges in Pakistan's healthcare system, individuals still pursue it for the respect and status associated with it. Female individuals may be drawn to medicine due to the unmatched respect and prestige it offers compared to other professions. Research opportunities and salary packages were also attractive factors, particularly in gynecology and pediatrics, which have high patient demand and facilitate data collection. Additionally, better working hours and social responsibility were significant factors guiding specialty decisions. Students passionate about their chosen specialty and eager to serve their community viewed social responsibility as their primary motivation. Role models, such as teachers and senior doctors, greatly influenced students' choices, while the impact of television, books, and media was relatively low. The research suggests a need for more accessible platforms, such as blogs, online resources, and television programs, to aid students in making informed decisions about medical specialties. Foreign job opportunities were not a significant factor, but serving in rural or underserved areas held importance. This finding underscores the focus on pursuing a passion for serving humanity and gaining experience in order to contribute meaningfully to society (Table 7).

Table 7: Factors for choosing a specialty for postgraduates

Factors for Choice of Specialty	Yes (Frequency)	No (Frequency)
Specialty prestige/status	71	17
Potential for administration	65	23
Research opportunities	70	18
Salary packages and benefits	69	19
Better Working hours	60	28
Social responsibility	71	17
Family influence	31	57
Friends influence	26	62
Influence from a role model	38	50
Influence from television, books or media	38	50
Foreign job opportunities	52	36
Opportunities for serving in rural/ lower areas	54	34

As far as statistical tests are concerned, comparisons were made for choice of specialties and factors affecting choice of specialties between final year students and postgraduates. The results showed that there was a statistical significance ($P=0.015$) for choice of specialties in basics sciences between final year students and postgraduates whereas no statistical significance ($P=0.622$) for choice of specialties in clinical sciences and factors affecting specialty choices ($P=0.107$) between final year students and postgraduates (Table 8).

Table 8: Statistical tests for choice of specialties and factors affecting choice of specialties between final year students and postgraduates

Paired Groups	p-value (Paired t-test)	Inference
Choice of specialties in basics sciences between final year students and postgraduates	0.015	Significant
Choice of specialties in clinical sciences between final year students and postgraduates	0.622	Not Significant
Factors affecting choice of specialties between final year students and postgraduates	0.107	Not Significant

DISCUSSION

A descriptive study at Christian Medical College, India, found that among final year students, top clinical specialization choices were General Surgery, General Medicine, and Pediatrics. For basic subjects, Family Medicine and Pathology were commonly chosen [16]. Similar results were observed in this conducted research with general surgery and general medicine as preferred clinical subjects, while Behavioral Sciences and Oncology were popular choices for basic subjects. A study at the University of Nairobi, Kenya, surveyed female postgraduate trainees to understand their medical specialization preferences. Results showed that they were less likely to choose obstetrics/gynecology and basic medical sciences. Instead, they preferred surgery, internal medicine, and pediatrics. Their reasons included higher income potential, increased patient-physician interaction, and a personal interest in research [17]. A similar study conducted in Pakistan revealed that females exhibited a pronounced inclination towards obstetrics and gynecology, along with a strong interest in basic medical sciences such as behavioral sciences, public health, and pathology. They chose these clinical and behavioral science subjects because they wanted to find a good balance between their work and family life. Additionally, they have faced gender discrimination and bias in their experiences [18]. This study was also conducted among Pakistani post graduate trainees reveals that females preferred gynecology and obstetrician. This difference might indicate that, in Pakistan, females choose

gynecology and obstetrician due to cultural norms, gender segregation, personal interest, career opportunities, and the chance to empower and advocate for women's health. A study conducted in Ethiopia highlights that 84% of postgraduate trainees opted for anatomy and behavior science as a career choice [19]. Another study conducted in England on postgraduate trainees shows that the students prefer microbiology followed by molecular biology and pharmacology as basic medical sciences subject [20]. This research shows that trainees selected anatomy followed by community medicine and behavioral sciences as their basic medical sciences subject. It can be seen that postgraduate trainees in developing and developed countries often have divergent career preferences and choices. Researchers extensively studied the factors influencing the selection of medical specialties among final year medical students in developed countries. They utilized renowned databases like MEDLINE/PubMed and EBSCOhost for their research. The results of the study revealed that the primary reasons behind choosing specific specialization subjects were increased research opportunities, a sense of social responsibility, and the chance to serve in underdeveloped areas [21]. This conducted research reveals that factors such as the prestige or status associated with a specialty, the salary package offered, the sense of social responsibility involved, and the prospect of better working hours play a significant role in their decision-making process of final year students. As far as post graduate trainees are concerned, research conducted among postgraduate trainees in California revealed their priorities when selecting their specialization field. The findings indicated that these trainees primarily considered research opportunities, followed by factors like social responsibility and working hours [22]. Furthermore, this research emphasizes the significance of various factors that influence postgraduate trainees, such as specialty prestige, research opportunities, and potential for administration.

CONCLUSIONS

Specialization choices differ in developing and developed countries. Developed countries prioritize research and serving underserved areas, while developing countries focus on higher pay and shorter duty hours due to limited mentorship, competition, and gender bias. To improve the situation, medical schools should implement tailored mentoring programs, collaborate with professional organizations, provide internship opportunities, and introduce policies promoting work-life balance.

Authors Contribution

Conceptualization: MMA

Methodology: MMA, WN

Formal analysis: MMA, WN, KA, MGQ, AM, AUM

Writing-review and editing: MMA, WN, KA, MSK, AM, AUM, FA, SIK, AP, MGQ

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

REFERENCES

- [1] Hao KA, Fu S, Islam S, Larson SD, Mustafa MM, Petroze RT, *et al.* Medical student career choice: who is the influencer? *Journal of Surgical Research*. 2022 Apr; 272: 9-16. doi: 10.1016/j.jss.2021.11.007.
- [2] Pahwa B, Kalyani M, Jain I, Bhattacharjee S. Will you choose neurosurgery as your career? An Indian female medical student perspective. *Journal of Clinical Neuroscience*. 2022 Nov; 105: 1-8. doi: 10.1016/j.jocn.2022.08.015.
- [3] Mohamed EY. Specialty preferences and factors affecting the choices of postgraduate specialty among undergraduate medical students. *Pakistan Journal of Medical Sciences*. 2022 Jul; 8(6): 1431. doi: 10.12669/pjms.38.6.5571.
- [4] Norris R, Wildstein A, Galanter CA. Medical student interest in straight-from-medical-school child and adolescent psychiatry specialization. *Academic Psychiatry*. 2022 Feb; 46(1): 55-9. doi: 10.1007/s40596-021-01583-z.
- [5] Öztürk N and Gençtürk M. A Research on the Factors Affecting the Preference of Medical Specialization Branches. *Journal of Medical Science*. 2022 Aug; 91(3): e691. doi: 10.20883/medical.e691.
- [6] Fang Y, Soljak M, Tan SL, Smith HE. Medical students' attitudes towards and views of general practice careers in Singapore: a cross-sectional survey and qualitative analysis. *BMC Medical Education*. 2022 Dec; 22(1): 1-10. doi: 10.1186/s12909-022-03298-7.
- [7] Eguia E, Kolachina S, Miller E, Eguia MA. Medical students from socioeconomically disadvantaged backgrounds are less likely to match into surgery. *World Journal of Surgery*. 2022 Jun; 46(6): 1261-7. doi: 10.1007/s00268-022-06510-3.
- [8] Wainwright D, Harris M, Wainwright E. Trainee doctors' perceptions of the surgeon stereotype and its impact on professional identification: a qualitative study. *BMC Medical Education*. 2022 Dec; 22(1): 1-10. doi: 10.1186/s12909-022-03765-1.
- [9] Smith GS, Houmanfar RA, Jacobs NN, Froehlich M, Szarko AJ, Smith BM, *et al.* Assessment of medical student burnout: Toward an implicit measure to address current issues. *Advances in Health Sciences Education*. 2022 May; 27(2): 375-86. doi: 10.1007/s10459-021-10089-0.
- [10] Earley H and Mealy K. An analysis of the cost of postgraduate training in surgery in Ireland compared to other specialties. *Irish Journal of Medical Science*. 2021 May; 191(2): 945. doi: 10.1007/s11845-021-02641-z.
- [11] Kaur A, Garg R, Gupta P. Challenges facing AI and Big data for Resource-poor Healthcare System. 2021 Second International Conference on Electronics and Sustainable Communication Systems (ICESC). 2021 Aug: 1426-33. doi: 10.1109/ICESC51422.2021.9532955.
- [12] Martin G, Bushfield S, Siebert S, Howieson B. Changing logics in healthcare and their effects on the identity motives and identity work of doctors. *Organization Studies*. 2021 Sep; 42(9): 1477-99. doi: 10.1177/0170840619895871.
- [13] Almalki M, FitzGerald G, Clark M. Health care system in Saudi Arabia: an overview. *EMHJ-Eastern Mediterranean Health Journal*. 2011 Oct; 17(10): 784-93. doi: 10.26719/2011.17.10.784.
- [14] Boucher NA, Dries E, Franzione A, Burton-Chase AM, Morris D, Sautter J. Developing the future end-of-life health care workforce: Lessons learned from a survey of advanced health professions students. *American Journal of Hospice and Palliative Medicine®*. 2022 Jun; 39(6): 613-8. doi: 10.1177/10499091211035711.
- [15] Sheu L, Charondo LB, O'Sullivan PS. Faculty motivations for leading clinical clerkship electives: A qualitative study. *Medical Teacher*. 2022 Oct; 44(10): 1109-15. doi: 10.1080/0142159X.2022.2058388.
- [16] Anand R, Sankaran PS. Factors influencing the career preferences of medical students and interns: a cross-sectional, questionnaire-based survey from India. *Journal of Educational Evaluation for Health Professions*. 2019 May; 16: 12. doi: 10.3352/jeehp.2019.16.12.
- [17] Dossajee H, Obonyo N, Ahmed SM. Career preferences of final year medical students at a medical school in Kenya-A cross sectional study. *BMC Medical Education*. 2016 Dec; 16: 1-10. doi: 10.1186/s12909-016-0528-1.
- [18] Kow CS, Teo YH, Teo YN, Chua KZ, Quah EL, Kamal NH, *et al.* A systematic scoping review of ethical issues in

- mentoring in medical schools. *BMC Medical Education*. 2020 Dec; 20(1): 1-10. doi: 10.1186/s12909-020-02169-3.
- [19] Teshome D. Attitude and perception of medical students towards histology subject at Wollo University, Ethiopia. *Advances in Medical Education and Practice*. 2022 Apr; 13: 337-44. doi: 10.2147/AMEP.S359703.
- [20] Adams JA and Dewsbury BM. Student preference for course approach to pedagogically different methodologies in anatomy and physiology. *Advances in Physiology Education*. 2022 Mar; 46(1): 45-55. doi: 10.1152/advan.00137.2020.
- [21] Khan S. The impact of gendered experiences on female medical students' specialty choice: A systematic review. *The American Journal of Surgery*. 2022 Nov; 225(1): 33-9. doi: 10.1016/j.amjsurg.2022.10.023.
- [22] Eidson-Ton WS, Rainwater J, Hilty D, Henderson S, Hancock C, Nation CL, et al. Training medical students for rural, underserved areas: a rural medical education program in California. *Journal of Health Care for the Poor and Underserved*. 2016 Nov; 27(4):1674-88. doi: 10.1353/hpu.2016.0155.