

Future Dreams of Junior and Senior Medical Students at a Public Saudi Medical School

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Background: Medical education is a challenging profession requiring students to acquire various skills and develop them continuously before and after graduation. The study aimed to assess the students' preference toward specialty and determine their preferred residency program and future ambitions regarding administrative and leadership positions.

Methodology: This is a cross-sectional self-administered survey that included medical students in 1st year, and 5th year and internship at Imam Mohammad Ibn Saud Islamic University (IMSIU). The questionnaire consisted of demographic information and questions about the student's choices regarding plans.

Results: Four hundred and fifty-eight (458) medical students out of 583 students (55.5% junior and 44.5% senior students) enrolled themselves in the study and completed the survey. Findings revealed that medical students' top five preferred future general medical specialties were surgery (34.5), followed by internal medicine (18.3), family medicine (17.2), dermatology (14.6), and emergency medicine (15.9). The junior students were found to be more inclined toward dermatology, medical genetics, and surgical general specialties. The findings showed that 63% of the students were interested in becoming future leaders, with 52.8% of them wishing to become head of a medical department. When asked about their desired qualifications, 85.8% preferred the Saudi Board.

Conclusion: Surgery was the most favorable specialty among medical students, followed by internal medicine, family medicine and dermatology, and emergency medicine. The study showed a significant difference between males and females and seniors and juniors in preference of specialty and medical qualification, the female medical students prefer to specialize in dermatology ($p=0.027$), neurology ($p=0.028$), and obstetrics and gynecology ($p=0.001$) as a general specialty significantly more than male medical students. It shows that students are interested in future leadership goals.

Keywords: career preference, students' dreams, future specialties, medical students, Saudi Arabia

Introduction

Medical education is a challenging and lifelong profession requiring students to acquire various skills and develop them continuously before and after graduation.^{1,2} Medical students in Saudi Arabia spend six years studying plus a one-year internship. Seeing the number of years spent studying and the amount of knowledge and skills needed in medicine can cause the decision to enter medical school to be overwhelming.³ One of the most challenging decisions that a medical student faces before graduation is choosing their future career specialty.⁴ It is often assumed that medical students do not choose their preferred career specialty until they graduate.⁵ The selection of a medical specialty is based on different factors such as cultural and social values, medical school characteristics, academic achievements, lifestyle, role models, finances, prestige, and job opportunities.^{6,7} Moreover, an essential factor that can affect the choice for the future especially is the level of completion of the desired residency program. Although many factors can affect student preference, the personal feature may play the most essential role in choosing a future specialty.^{8,9} Furthermore, gender can play a role in selecting the future specialty careers as the difference in choices is expected; gender influences not only the specialty chosen but also the reasons that contribute to making this choice.¹⁰ Certain specialties are

favorable among medical students, as a recent systemic review study found that, surgery and internal medicine were the most wanted specialties in North America, the European Union, Australia, and New Zealand.⁷ The medical student's preference for choosing a medical specialty is an essential factor that affects the health system as a whole; that is why studying the factors that influence this choice can provide important information that will help in developing an educational program that will help in achieving the health system priorities and needs.^{5,11} Surgery was the most popular specialty among male Jordanian medical students, followed by internal medicine and orthopedics.⁵ In contrast, female students favored obstetrics and gynecology, pediatrics, and surgery, respectively. Anesthesiology was no longer an area of interest for male students, but 3.1% of females showed interest in it. Overall, orthopedics, ophthalmology, and dermatology were not preferred as a specialty. A study was conducted at three Canadian universities;⁸ the research team brought in 583 students entering medical schools to complete a questionnaire; the majority of respondents (about half) rated family medicine as their top 3 career choices, while only 20% identified it as their first choice. Five factors emerged from the factor analysis (diverse range of medical practice opportunities, a hospital-based attitude, reputation, socio-economic orientation, medical lifestyle), or (medical lifestyle, societal orientation, prestige, hospital orientation, and varied scope of practice).⁸

This study aimed to explore the future medical career preferences among junior (first and second-year) students and senior students (fifth-year and interns) at Imam Mohammed Ibn Saud Islamic University College of Medicine, the results help provide us with a better understanding of what medical students prefer in terms of career path and preferred residency training programs to enroll in future.

Materials and Methods

Study Design

A cross-sectional self-administered survey study was carried out in Saudi Arabia in Riyadh City from March 1 to April 1, 2022, at Imam Mohammad Ibn Saud Islamic University, College of Medicine.

Study Subjects

The study population includes junior students (first and second-year) and senior students (fifth-year and interns) at Imam Mohammed Ibn Saud Islamic University, College of Medicine.

Convenience sampling was used in this research. The inclusion criteria are medical interns and students in their 1st year and 5th year, both male and female. Moreover, the exclusion criteria included any other medical students from other colleges' study levels.

Sample Size

The sample size was calculated using Raosoft (Raosoft Inc., Seattle, Washington, USA) based on a confidence interval of 95% and a 5% margin of error, to meet the standard approximation assumption, which resulted in a sample size of 384 students.

Study Questionnaire

The English-language self-administered online questionnaire was designed by the authors. The students were informed about the purpose of the study. Instructions regarding the questionnaires were provided to volunteering students. The confidentiality of information was also ensured. Once students voluntarily signed the informed consent, they were requested to fill in the study questionnaire. The questionnaire was composed of two parts and nine questions; part I addressed the demographic data, including age, sex, nationality, and level of education, and part II covered questions about the influence of relatives in the medical field, preferred medical specialty, and subspecialty, desired medical qualification, affiliation and interest in future administrative and leadership role. In the demographic data, age is divided into 18–21, 22–24, and 25 and above while nationality was divided into Saudi and non-Saudi from a Saudi mother, a yes/no question was used to determine if a close relative or a family member (parents, siblings, grandparents, uncles, aunts, first cousins), was in the medical field. A total of 20 general specialties and others were listed in the questionnaire. A short explanation of the nature of these specialties and the demographics of patients that goes to them were stated with each specialty. More than 100 subspecialties were included that cover almost all surgical, non-surgical, medical, and basic medical sub-specialties. Followed by a question about the intended desired residency and qualification

programs such as the Saudi Board, Canadian and American Board, Jordanian Board, Arab Board, European Board, and Australasian Board. This was followed by a question about the desired clinical practice and hospital affiliation such as King Faisal Specialist Hospital and Research Center, Security Force Hospitals, King Fahad Medical City, King Saud Medical City, and others. The final question measured the medical student interest in pursuing an administrative and leadership positions such as head of the medical unit, head of a department, director of the residency training program, executive officer of general hospital and others. The questionnaire was subjected to pilot testing by 25 students. The authors approached students in their respective classes and provided them with printed copies of the questionnaire. Pre-testing was done to assess the reliability of the questionnaire for the sample; some questions were modified accordingly. All targeted students were emailed to participate and reminded via emails and an SMS message.

Data Analysis

The mean and standard deviation were used to describe the continuously measured variables, and the frequencies and percentages were used to describe the categorically measured factors. The Kolmogorov–Smirnov test of statistical normality and the histograms were used to assess the normality assumption for metric variables. The multiple response dichotomies analysis described the variables measured with more than an option. The chi-squared association test was used to assess the association between the student's years of study with their future medical specialty aptitudes. Also, the chi-squared test was used to determine the differences between male and female medical students on their perceptions of future career outlooks. A continuity-adjusted chi-squared association test was used for the 2×2 contingency tables that showed statistical count violations within the contingency table cells (ie, when one or more cells had counts of 5 or less of the expected count). The SPSS IBM program V21 was used for the statistical data analysis. Alpha significance level was considered statistically significant at 0.050 level.

Results

Four hundred and fifty-eight medical students (55.5% junior and 44.5% senior students) had enrolled themselves electively in the study and had completed the survey. Most of the students, 69.7% were male, and 46.1% were aged between 18–20 years. Moreover, 53.3% had at least one or more family members who were medical practitioners as shown in Table 1.

Table 1 Descriptive Analysis of the Medical Student's Sociodemographic and Academic Characteristics

		Frequency	Percentage
Sex			
	Female	139	30.3
	Male	319	69.7
Age group			
	18–20 years	211	46.1
	21–24 years	171	37.3
	≥25 years	76	16.6
What medical study year you are now			
	First Year	254	55.5
	Fifth year	204	44.5
Does any of your parents or close relatives work in the medical field?			
	No	214	46.7
	Yes	244	53.3

Table 2 Descriptive Analysis of the Student's Future Preferences About Their Career

	Frequency	Percentage
What is your dream future general medical specialty?		
Allergy and immunology	12	2.6
Anesthesiology	20	4.4
Dermatology	67	14.6
Diagnostic radiology	23	5
Emergency Medicine	73	15.9
Family medicine	79	17.2
Internal medicine	84	18.3
Medical geneticist	15	3.3
Neurology	53	11.6
Nuclear medicine	3	0.7
Obstetrician/gynecologists	13	2.8
Ophthalmology	53	11.6
Pathology	11	2.4
Pediatrics	39	8.5
Physical medicine and rehabilitation	9	2
Preventive medicine	6	1.3
Psychiatry	34	7.4
Radiation oncology	10	2.2
Surgery	158	34.5
Urology	13	2.8

Table 2 summarizes the medical student's perceptions about their future primary specialty, sub-specialty, affiliations, and leadership career options. The findings showed that the medical students' top seven preferred future general medical specialties were surgery, then internal medicine, followed by family medicine, dermatology, emergency medicine, neurology, and ophthalmology.

The medical students were asked to select their desired medical subspecialties in the future. The results denote that there are generally between 2–3 preferred subspecialties by the medical students on average. However, the findings showed that the medical students' top ten preferred future medical sub-specialties were: cardiovascular disease, dermatology, general surgery, cardiac surgery, neurosurgery, orthopedic surgery, plastic surgery, surgical critical care, critical care medicine, and gastroenterology. The male and female medical students were compared on their futuristic medical ambitions; the female medical students preferred to specialize in dermatology, neurology, and obstetrics and gynecology as a general specialty significantly more than male medical students, $p=0.027$,

$p=0.028$, $p=0.001$, respectively. In Table 3, when comparing junior and senior medical students, the analysis showed that the junior students were found to be significantly more inclined to plan for dermatology general specialty $p=0.037$, medical genetics $p=0.013$, pathology $p=0.037$, and surgical general specialties $p<0.001$ compared to senior students. On the other hand, the senior medical students were significantly more inclined to family medicine $p<0.001$, pediatrics general specialty $p=0.010$, preventive medicine $p=0.019$, psychiatry $p=0.035$, and urology specialties $p=0.017$ compared to junior medical students.

Table 4 shows the most preferred future postgraduate certifications of the study participants. The finding showed that 86% prefer Saudi Board certifications. Furthermore, 43.3% preferred King Saud University Medical City as a future clinical practice affiliation center. Regarding the future desired postgraduate certifications, the female students were significantly more inclined to Arab Board certifications than males, $p=0.040$. However, they were also found to be slightly more prone to desire the Canadian and/or American Board as future certifications than male students, $p=0.068$. Regarding future clinical

Table 3 Bivariate Comparison Between Junior and Senior Medical Students on Their Future Career Aspects

	Year of Study		p-value
	Junior	Senior	
What is your dream future general medical specialty?			
Allergy and Immunology	6 (2.4)	6 (2.9)	0.700
Anesthesiology	9 (3.5)	11 (5.4)	0.336
Dermatology	45 (17.7)	22 (10.8)	0.037
Diagnostic Radiology	10 (3.9)	13 (6.4)	0.236
Emergency Medicine	39 (15.4)	34 (16.7)	0.703
Family Medicine	21 (8.3)	58 (28.4)	<0.001
Internal Medicine	47 (18.5)	37 (18.1)	0.920
Medical geneticist	13 (5.1)	2 (1)	0.013
Neurology	35 (13.8)	18 (8.8)	0.099
Nuclear Medicine	3 (1.2)	0	0.330
Obstetrician/Gynecologists	6 (2.4)	7 (3.4)	0.493
Ophthalmology	35 (13.8)	18 (8.8)	0.099
Pathology	10 (3.9)	1 (0.5)	0.037
Pediatrics	14 (5.5)	25 (12.3)	0.010
Physical Medicine and Rehabilitation	6 (2.4)	3 (1.5)	0.730
Preventive Medicine	0	6 (2.9)	0.019
Psychiatry	13 (5.1)	21 (10.3)	0.035
Radiation Oncology	7 (2.8)	3 (1.5)	0.539
Surgery	118 (46.5)	40 (19.6)	<0.001
Urology	3 (1.2)	10 (4.9)	0.017

Table 4 What are Your Desired Postgraduate Certifications?

	Frequency	Percentage
What are your desired postgraduate certifications?		
Saudi Board	382	85.8
Arab Board	35	7.9
Canadian / American Board	166	37.3
Jordanian Board	5	1.1
European board	62	13.9
Australasian board	16	3.6
PhD	59	13.3

affiliation, the female medical students were found to be significantly more predicted to prefer the King Faisal Specialist Hospital and Research Center than male students, $p=0.039$. In addition, the female medical students were slightly more inclined to other medical clinical centers affiliations like (King Saud Medical City at MOH, and King Saud Medical City at King Saud University Hospitals) compared to male medical students. The medical student's gender levels did not correlate significantly with the student's leadership future endeavors. Nevertheless, female medical students were slightly more inclined to aim at the chair of the academic department compared to the male students, $p=0.055$. The senior students were significantly more inclined to desire the Saudi Board compared to the juniors, $p<0.001$, but the junior medical students were significantly more prone to the Canadian and/or American, European, Australian, and Ph.D. postgraduate certifications compared to the senior medical students. Regarding the clinical medical affiliation, the senior medical students were found to be significantly more inclined to prefer the King Abdulaziz Medical City of the National Guard compared to juniors, $p=0.019$.

Table 5 Future Ambitions for Administrative and Leadership Positions, n=288

	Frequency	Percentage
Head of the medical unit	118	41
Head of the department	152	52.8
Director of the residency training program	73	25.3
Executive officer of general hospital	43	14.9
Chief- Executive officer of medical city	51	17.7
Chief- Executive officer of the primary care center	20	6.9
Chair of Academic department	47	16.3

As shown in Table 5, the students were asked to indicate their future medical leadership endeavors. More than half (52.8%) of them wished to become head of a medical department. In contrast, 37.1% of the students did not prefer leadership roles and did not have tentative leadership endeavors in the meantime.

Discussion

Career preferences made by medical students and junior doctors are one of the significantly essential concerns to the medical workforce planners, especially when some specialties show an oversupply or undersupply of doctors.^{12–14} The importance of specialty preferences is that they will motivate the students' learning tendencies and patterns.^{15,16} In addition, it is essential to encourage talented students to participate in their desired specialty in the long-term context. Moreover, it is vital to ensure a balanced distribution of health professionals between the specialties.¹⁷ Although medical education during undergraduate years involves educating the undergraduates about specialized medical specialties, it is generally assumed that medical students will not make their own particular decisions unless they graduate from medical school.^{8,18} The current study proved that there is a difference between the aspirations of the new students and the advanced students. Perhaps the lack of experience of new students in clinical specialties and their poor knowledge of the reality of future medical specialties leads to the lack of certainty in choosing their future specialties, which leads to a change in their choices as they progress in clinical experience. Some specialties attract more students than others, while others generally are less considered as major ones in the future due to a multitude of reasons that could lead to mismatch problems generating specialties with an unnecessary load of physicians and others with doctor shortage.^{19,20} Our results revealed that the medical students had chosen their future specialty preference, and the majority tended to sway toward general surgery, internal medicine, family medicine, dermatology, and emergency medicine. Medical students' interest in surgery and internal medicine is confirmed by the results of previous studies carried out in Saudi Arabia,^{16,21–23} and in Europe.²⁴ These attractive specialties seem to be associated with more financial rewards than the other specialties. In a previous study carried out by Al-Faris et al among 302 final-year students, the author found that among the medical students, a higher preference was found for internal medicine, surgery, obstetrics, and pediatrics. However, the most common factors associated with these preferences are personal interest, having the chance to help people, prestige, and having a higher income.²³ In a study conducted by Rukewe et al, the authors found that surgery, pediatric, internal medicine, obstetrics, and gynecology were the most preferred specialties among Botswana students.²⁵ In Saudi Arabia, a study conducted by Mahfouz showed that family medicine was the most common specialty among medical students in the Taif region, followed by ENT.²² Another study conducted by Alsubaie et al among medical students at Alfaisal University found that surgery was the most preferred specialty among the students.²⁶

One of the current topics of interest is gender differences in career choice. Many studies have examined these differences in multiple populations. They have shown that female students are more interested in pediatrics, obstetrics, and gynecology compared to their male counterparts and that surgery is less popular among female students.^{27–29} This is similar to our result where female medical students have opted for dermatology as a general specialty compared to male students.

In Japan, a study carried out by Fukufa revealed that the most preferred choice of specialties among medical students was internal medicine, followed by surgery, pediatrics, and emergency medicine. The authors also found that

male students had a higher preference for some specialties such as general surgery, orthopedic surgery, neurosurgery, and emergency medicine compared to female students who had a higher preference for obstetrics, gynecology, and dermatology.³⁰ Furthermore, Khader's study, conducted at Jordan University of Science and Technology, showed that the most popular specialty among male medical students was surgery, followed by internal medicine and orthopedics. In contrast, female students preferred obstetrics and gynecology, followed by pediatrics and surgery.⁵ Hashimi et al in Pakistan found that the most preferred specialty among postgraduate students was surgery, followed by obstetrics and gynecology. They found that obstetrics and gynecology were preferred more by female students compared to their male counterparts. In contrast, male students chose surgery with a significant difference between gender.³¹

Our analysis found that the mean number of the medical students' preferred subspecialties was equal to 2.5 subspecialties per student. This could be due to the lack of certainty of the appropriate specialization for a student among medical students. This uncertainty is also reported by previous studies such as the study of Alsubaie et al and Rukewe et al, which found that 36% of medical students did not decide on their future specialty.^{25,26}

Among junior students, this uncertainty could be explained by the lack of exposure to these specialties or insufficient knowledge or experience in these specialties and other sub-specialties, making it difficult to determine their preferred specialty. Moreover, cardiovascular disease was the most common preferred medical sub-specialty, followed by dermatology and cardiac surgery. On the other hand, we found that the least picked specialties include preventive medicine, nuclear medicine, clinical cytogenetics, maternal-fetal medicine, and pediatric orthopedics specialties. This could be rationalized because these specialties are not well-covered in the curriculums. However, this lack of interest in some specialties could lead to a shortfall in postgraduate entrants in these fields, which in the long term, could lead to a shortage of particular specialists.³² These alarming results call for strategies to attract medical students to less glamorous disciplines. The Kingdom of Saudi Arabia's health needs should be better served with adequate and appropriate health resources covering all medical specialties.

When we compared the futuristic medical ambitions of junior and senior students, the results showed that there is a significant difference between the two groups in some specialties, including dermatology, pathology, and surgery which are preferred more by juniors compared to family medicine and pediatrics which are preferred more by seniors. The change in preference between junior and senior students is predictable because of the higher education provided to senior students. These results were also reported in some previous studies.^{33,34} Most of the students desired to pursue the Saudi Medical Board as a future medical residency program, which is significantly different between males and females and between junior and senior, where both females and seniors tend more to Saudi and Arab Board qualifications. In contrast, males and juniors desire the Canadian and/or American Board more as a future residency program. Nowadays, the Saudi Commission for Health Specialties (SCFHS) is the leading national health licensing body in Gulf cooperative and Arab countries. Moreover, SCFHS is responsible for supervising and evaluating training programs, as well as setting controls and standards for the practice of health professions. To date, the number of providing postgraduate training programs has exceeded 67.³⁵

With regards to the ambitions of the students toward administrative and leadership positions, the study found that 52.8% of them wish to become head of a medical department and 41% had dreams of becoming head of medical units. Medical students generally have a positive attitude towards multidisciplinary groups, but the belief that doctors lead or should lead the group can be positive or negative. Students may appear ready to take on leadership roles in the clinical team but may not have the desire to be a follower in the team or be led in the administrative group.³⁶ These findings are essential for curriculum planners and faculty members to prepare students for their future workplace needs. This recognizes the need for leadership training at the level of undergraduate medical education.³⁷

Limitations

The major limitation of this study is the small sample size, however, the authors were primarily interested in how students who had recently begun medical school understood the idea of specialty choices. Throughout their medical school, it is intended to check in with the same students to see how their preferences develop. Only a few students' thorough responses to the open-ended questions severely limited the study's ability to collect qualitative data.

Conclusion

The study showed a significant difference between males and females and seniors and juniors in preference of specialty and medical qualification. Surgery was the most favorable specialty among

medical students, followed by internal medicine, family medicine, dermatology, and emergency medicine. In contrast, attitudes toward administrative and leadership positions showed that medical students are interested in becoming future leaders and would like to take on further responsibilities of becoming administrators. The least preferred specialties such as preventive medicine and basic medical specialties must seek more attention for promotion at the departmental, medical college, and national levels.

Ethical Considerations

The IMSIU research ethics committee approved the study (project number 194-2022; approval date, February 15, 2022). The study was conducted in accordance with the ethical principles of the declaration of Helsinki. A brief description of the study was included with the survey link, with a full explanation on the survey's front page. Participants were told consent was given by filling out the survey. Throughout the study, consent of all participants and data were gathered in complete confidence.

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References

1. Harden RM. Outcome-based education: the future is today. *Med Teach*. 2007;29(7):625–629. doi:10.1080/01421590701729930
2. Hilgers J, de Roos P, Rigby E, Hilgers J, De Roos P, Rigby E. European core curriculum - The students' perspective, Bristol, UK, 10 July 2006. *Med Teach*. 2007;29:270–275. doi:10.1080/01421590701268731
3. Hill MR, Goicochea S, Merlo LJ. In their own words: stressors facing medical students in the millennial generation. *Med Educ Online*. 2018;23(1):1530558. doi:10.1080/10872981.2018.1530558
4. Mohammed TAH, Abdulrahman AA, Saud KA, Alaa NT. Specialty preferences and factors affecting future career choice among medical graduates in Saudi. *J Family Med Prim Care*. 2020;9(3):1459–1463. doi:10.4103/jfmpe.jfmpe_1199_19
5. Khader Y, Al-Zoubi D, Amarin Z, et al. Factors affecting medical students in formulating their specialty preferences in Jordan. *BMC Med Educ*. 2008;8:32. doi:10.1186/1472-6920-8-32
6. Al-Ansari SS, Khafagy MA. Factors affecting the choice of health specialty by medical GRADUATES. *J Family Community Med*. 2006;13(3):119–123.
7. Levaillant M, Levaillant L, Lerolle N, Vallet B, Hamel-Broza JF. Factors influencing medical students' choice of specialization: a gender-based systematic review. *EClinicalMedicine*. 2020;28:100589. doi:10.1016/j.eclinm.2020.100589
8. Wright B, Scott I, Woloschuk W, Brenneis F, Bradley J. Career choice of new medical students at three Canadian universities: family medicine versus specialty medicine. *CMAJ*. 2004;170(13):1920–1924. doi:10.1503/cmaj.103111
9. Budakoglu I, Karabacak O, Coskun O, Karabacak N. Personality and learning styles of final-year medical students and the impact of these variables on medical specialty choices. *Gazi Med J*. 2014;25:138–141. doi:10.12996/gmj.2014.43
10. Huda N, Yousuf S. Career preference of final year medical students of Ziauddin Medical University. *Educ Health*. 2006;19(3):345–353. doi:10.1080/13576280600984087
11. Dikici MF, Yaris F, Topsever P, et al. Factors Affecting Choice of Specialty Among First-year Medical Students of Four Universities in Different Regions of Turkey. *Croat Med J*. 2008;49(3):415–420. doi:10.3325/cmj.2008.3.415
12. National Medical Workforce Strategy; 2021:98.
13. Takeda Y, Morio K, Snell L, Otaki J, Takahashi M, Kai I. Characteristic profiles among students and junior doctors with specific career preferences. *BMC Med Educ*. 2013;13:125. doi:10.1186/1472-6920-13-125
14. Chaudhuri E, Mason NC, Newbery N, Goddard AF. Career choices of junior doctors: is the physician an endangered species? *Clin Med*. 2013;13(4):330–335. doi:10.7861/clinmedicine.13-4-330
15. Mehmood SI, Khan MA, Walsh KM, Borleffs JCC. Personality types and specialist choices in medical students. *Med Teach*. 2013;35(1):63–68. doi:10.3109/0142159X.2012.731104
16. Mehmood SI, Kumar A, Al-Binali A, Borleffs JCC. Specialty preferences: trends and perceptions among Saudi undergraduate medical students. *Med Teach*. 2012;34(sup1):S51–S60. doi:10.3109/0142159X.2012.656753
17. Al-Zubi M, Ali MM, Alzoubi S, et al. Preference of and factors that influence future specialty among medical students in Jordan: a cross-sectional study. *Ann Med Surg*. 2021;67:102527. doi:10.1016/j.amsu.2021.102527

18. Clinical placements for medical students; 2020:24.
19. Kaliyadan F, Amin TT, Qureshi H, Al Wadani F. Specialty preferences of 1st-year medical students in a Saudi Medical School – factors affecting these choices and the influence of gender. *Avicenna J Med.* 2015;5(4):134–139. doi:10.4103/2231-0770.165120
20. Friedberg MW. *Factors Affecting Physician Professional Satisfaction and Their Implications for Patient Care, Health Systems, and Health Policy.* Rand Health, American Medical Association; 2013.
21. Alshahrani M, Dhafery B, Mulhim MA, Alkhadra F, Bagshi DA, Bukhamsin N. Factors influencing Saudi medical students and interns' choice of future specialty: a self-administered questionnaire. *AMEP.* 2014;5:397–402. doi:10.2147/AMEP.S69152
22. Mahfouz MEM, Althobaiti ZF, Alosaimi SG, et al. Specialty choice among final-year medical students at taif university. *Saudi J Health Syst Res.* 2021;1(3):115–122. doi:10.1159/000517662
23. al-Faris E, Kalantan K, al-Rowais N, et al. Career choices among Saudi medical students. *Acad Med.* 1997;72(1):65–67.
24. Mariolis A, Mihas C, Alevizos A, et al. General Practice as a career choice among undergraduate medical students in Greece. *BMC Med Educ.* 2007;7(1):15. doi:10.1186/1472-6920-7-15
25. Rukewe A, Abebe WA, Fatiregun AA, Kgantshang M. Specialty preferences among medical students in Botswana. *BMC Res Notes.* 2017;10(1):195. doi:10.1186/s13104-017-2523-y
26. Alsubaie N, Aldhofaian HS, Alhuwaimel L, et al. Specialty preferences and the factors influencing them among pre-clerkship medical students: the first study from Alfaisal University-College of Medicine, Saudi Arabia. *Cureus.* 2016. doi:10.7759/cureus.894
27. Kawamoto R, Ninomiya D, Kasai Y, et al. Gender difference in preference of specialty as a career choice among Japanese medical students. *BMC Med Educ.* 2016;16(1):288. doi:10.1186/s12909-016-0811-1
28. Egerton EA. Career preference inquiry among Queen's University medical undergraduates and graduates: a follow-up. *Med Edu.* 1983;17(2):105–111. doi:10.1111/j.1365-2923.1983.tb01109.x
29. Dorsey ER, Jarjoura D, Rutecki GW. The Influence of controllable lifestyle and sex on the specialty choices of Graduating U.S. Medical Students, 1996–2003. *Acad Med.* 2005;80(9):791–796. doi:10.1097/00001888-200509000-00002
30. Fukuda Y, Harada T. Gender differences in specialty preference and mismatch with real needs in Japanese medical students. *BMC Med Educ.* 2010;10(1):15. doi:10.1186/1472-6920-10-15
31. Hashmi NR, Daud S, Manzoor I, et al. Factors affecting medical specialty preferences and associated gender differences in fourth-year MBBS students. *J Postgrad Med Inst.* 2010;24(2). 101–107
32. Mohamed AA, Khan WS, Abdelrazig YM, et al. Factors considered by undergraduate medical students when selecting specialty of their future careers. *Pan Afr Med J.* 2015;20. doi:10.11604/pamj.2015.20.102.4715
33. Grasreiner D, Dahmen U, Settmacher U. Specialty preferences and influencing factors: a repeated cross-sectional survey of first- to sixth-year medical students in Jena, Germany. *BMC Med Educ.* 2018;18(1):103. doi:10.1186/s12909-018-1200-8
34. Asaad M, Zayegh O, Badawi J, et al. Gender differences in specialty preference among medical Students at Aleppo University: a cross-sectional study. *BMC Med Educ.* 2020;20(1):184. doi:10.1186/s12909-020-02081-w
35. The Saudi Commission for Health Specialties (SCFHS). About the SCFHS. Available from: <https://www.scfhs.org.sa/en/about/pages/organization.aspx>. Accessed May 20, 2022.
36. Abbas MR, Quince TA, Wood DF, Benson JA. Attitudes of medical students to medical leadership and management: a systematic review to inform curriculum development. *BMC Med Educ.* 2011;11(1):93. doi:10.1186/1472-6920-11-93
37. James E, Evans M, Mi M. Leadership training and undergraduate medical education: a scoping review. *Med Sci Educ.* 2021;31(4):1501–1509. doi:10.1007/s40670-021-01308-9

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