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Understanding the factors that influence the choice of medical field specialization selection in Saudi Arabian medical students

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ABSTRACT

Background: The career choice of specialization in the medical profession is very complex. This study aimed to observe the most popular choice of medical field specialization, factors influencing the student's choices, and future job features that would impact the choice of medical field specialization.

Methods: A cross-sectional study was conducted through a self-administered online survey, distributed by email, through the Office of Clinical Affairs, to the final year (sixth year) medical students and interns in seven different medical schools in the Western Region of Saudi Arabia.

Results: A total of 294 participants completed the survey, of which 56.5% were sixth-year medical students. The gender distribution of the sample was almost 2:1 female to male ratio. The most common choice of field specialization was surgical subspecialty followed by emergency medicine at 16.0%, and 15.6%, respectively. The items that had the most impact on the medical students' choice of medical field specialty were: love of the specialty (57.0%), followed by attending a rotation in the chosen field (43.8%). Future job features that had a major impact in choosing the field of specialization were: wanting to work in a large city hospital (38.6%), followed by the ability to have time to pursue other non-medical interests (31.7%).

Conclusions: The most popular specialty chosen was a surgical subspecialty, by both sexes, followed by emergency medicine. The most influencing personal factor was the love of the field, and the most influencing future job feature was to work in a large city hospital.

Keywords: Specialty preference, medical students, undergraduates, career choice, specialties.

Introduction

Selecting a specialty for medical students is a complex process because it is influenced by several factors, such as the student's inclination towards the specialty, the field's attributes, years of study, and the degree to which that particular specialization is needed at the time [1].

Nonetheless, educators believe that understanding the elements influencing a student's decision regarding their prospective future specialization is crucial because it might offer insights into the influencing factors that have a major impact on this life-defining decision [1]. According to a recent meta-analysis, the following factors primarily affected medical specialization decisions in a major way including student medical interests (75%), patient service (50%), mentor influence (46%), and job characteristics (44%). In addition, working hours, pay, length of training, and prestige were all factors in the decision about which vocation to pursue. Although personality types and gender variations were also prevalent determinants, their impact has not been reported in the literature [2].

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Moreover, an American study discovered that a controlled lifestyle could account for almost half of the heterogeneity in specialty preferences [3]. Therefore, increasing knowledge of the variables influencing students' specialization decisions would help us better understand, and be in a position, to counsel medical students on the field specializations they should consider [2,4]. Previous studies on this topic showed quite a bit of heterogeneity depending on the region in which the study was conducted [5-9]. To that end, this survey aimed to determine which elements mattered the most to these would-be physicians in the Western region of Saudi Arabia, mainly in the cities of Jeddah, Makkah, and Taif.

Subjects and Methods

This was a cross-sectional study that was conducted through a self-administered online survey that was distributed by email, through the Office of Clinical Affairs, to the final year (sixthyear) medical students and interns in seven different medical schools in the Western region of Saudi Arabia. Five of the seven schools were public schools including Umm AlQura University Medical School - Makkah branch (UQU-M), Umm AlQura University Medical School - AlQunfutha branch (UQU-Q), King AbdulAziz University Medical School - Jeddah (KAAU), King Saud bin Abdulaziz University for Health Sciences Medical School - Jeddah, and Taif University Medical School - Taif (TU). The two private colleges were Ibn Sina National Medical College, Jeddah and Batarji Medical College, Jeddah.

Sample size calculation and validation

For a type I error of 0.05 (α), an expected proportion of 0.5 (p), and an absolute error or precision (d) of 0.06, the required sample size as calculated by an online calculator (https://www.qualtrics.com/blog/calculating-sample-size/) was 267 participants. All questions in the survey were adapted from the study that was run by Scott et al. [10]. The questionnaire in that study was previously validated in a pilot study among medical school students in 17 classes across 7 Canadian medical schools in 2003-2004.

Firstly, the study participants were asked to list their top three choices of medical specialization from the following 11 choices: Critical care specialties which include emergency medicine, pediatric emergency medicine, anesthesia, and intensive care medicine; general surgery; surgical subspecialties which include urology, plastic surgery, vascular surgery, orthopedic surgery, cardiothoracic surgery, pediatric surgery, maxillofacial surgery, otolaryngology, neurosurgery, and ophthalmology; general internal medicine; medical subspecialties that include cardiology, nephrology, neurology, rheumatology, immunology, gastroenterology, endocrinology, hematology, oncology, pulmonology, and infectious diseases; family medicine; obstetrics and gynecology; general pediatrics; pediatric subspecialties which include cardiology, nephrology, neurology, rheumatology, gastroenterology, endocrinology, hematology, and pulmonology; supportive services which include radiology, interventional radiology, physiotherapy, occupational medicine, and clinical pathology; and other disciplines such as epidemiology, research, informatics, medical education, and medical administration.

Second, the study participants were then asked to indicate the impact of each of the following 16 personal factors on their medical specialization choice preference on a Likert scale ranging from no impact to minimal impact, to moderate impact, to major impact, to decisive impact. The items included attending a rotation in the chosen field; working with a particular consultant in the chosen field; witnessing a particular incident or situation that touched you deeply, making you want to enter the chosen field; having done volunteer work in the chosen field; having to live through a personal life-long illness, or supporting a loved one with a life-long illness that made you want to specialize in the field of that illness; personal desire and love for the chosen field; the need of the community for the chosen field; the advice or pressure from a family member in the chosen medical field; the advice of a resident already in the chosen medical field; the desire to choose a relatively easy field; the desire to work with the critically ill; the desire to work with acute cases; the desire to work with chronic conditions; the desire to work in a field where the immediate effects of treatment can be seen; the desire to work in a general medical field; the desire to work in a specialized medical field; and the desire to work with patients with psychiatric and functional illnesses.

Finally, the study participants were also asked to indicate the impact of each of the following 13 future job-related factors on their medical specialization choice preference on a Likert scale ranging from no impact to minimal impact, to moderate impact, to major impact, to decisive impact. The items included the desire to work in a large city hospital; the desire to work in a small country-side clinic; the desire to be in a job that does not deal with the general public; the desire to work in a job with good financial returns; the desire to work regular hours (non-shift work); the desire to work in an outpatient clinic setting; the desire to avoid working in an outpatient clinic setting; the desire to work with patients who require interventional procedures; the desire to work with patients who do not require interventional procedures; the desire to work in an administrative or executive position; the desire to work in an educational or academic post; the desire to work in a position with research opportunities; the desire to work in a position that will allow me to pursue my other non-medical interests.

Data on the age, gender, medical college, marital status, spouse job (if any), and educational year of each subject were also obtained. Once the data were collected, it was input into a single database and analyzed using the Statistical Packages for Software Sciences (SPSS) v.26. Proportions were noted, and the Mann-Whitney *Z*-test and Kruskal Wallis *H*-test were used to measure sociodemographic data, risk factors, and signs and symptoms. Due to the non-normal distribution of data, the non-parametric Pearson correlation test was applied for all subgroup analyses to ascertain the statistical significance of the findings, concerning gender, and year of field choice.

Results

In this study, 450 participants were surveyed, of which only 350 responded and 56 survey forms were incomplete (15.6%). A total of 294 completed surveys were collected and used for analysis (65.3% response). Half of the sample came from UQU-M and UQU-Q, while KAAU and Taif University (TU) made up 18.0% and 19.7% of the sample, respectively. The sample was 56.5% sixth-year medical students, 39.1% interns, and the rest were graduates who had finished their internship. The gender distribution of the sample was almost 2:1 female to male (63.3%-36.7%) (Table 1).

Around 91% of the sample surveyed were single, while engaged to be married, and married participants made up 5.1%-2.5% of the sample, respectively. A total of 160 participants (54%) reported having a physician in their family, with the most common specialization being a medical subspecialty (such as cardiology, nephrology, and so on), 12.9% were supportive services (such as radiology, pathology, transfusion medicine, pharmacy, and so on), and 10.9% were surgical subspecialties (such as orthopedic, vascular, and plastic surgery).

The majority of the sample (23.5%) made field specialization decisions in their fifth year of medical school. Meanwhile, 22.1% made their specialization choice in their internship year or later. Interestingly, 19.5% had already decided on their field of choice in the pre-clinical years (the first 3 years of medical school) before they had experienced different medical rotations. The most common first[t] choice of field specialization in the sample was surgical subspecialties, followed by emergency medicine, and medical subspecialties at 16.0%, 15.6%, and 10.9%, respectively (Figure 1) (Table 2).

The items that had the most impact on the medical students' choice of medical field specialty in descending order were love of the specialty by 57.0%; attending a rotation in the chosen field by 43.8%; and working with a particular consultant in the chosen field by 43.0%. Moreover, the factors that had no impact on the decision of medical specialization were pressure from a family member (71.1 %) and wanting an easy field of specialization (57.8 %) (Figure 2).

Future job factors that had a major impact in choosing the field of specialization were found to be wanting to work in a large city hospital (38.6%); the ability to have time to pursue other non-medical interests (31.7%); and the desire to work in an outpatient clinic setting (28.5%). The job factors that had no impact on specialization choice were the desire to work in a small country clinic (72.3%) and working in a non-outpatient environment (64.7%) (Figure 3).

Further subgroup analyses were performed concerning gender. Although it was not statistically significant, there was a somewhat surprising tendency for female students to prefer emergency medicine, pediatrics, and surgical specialties more than male students, while males preferred general internal and family medicine (p-value = 0.310). Working with a particular consultant had a more profound impact on the specialty decision in female students than in male students (46.1%-38.0%, respectively, p-value = 0.009), as did the love of the field itself (64.5%-45.8%, respectively, p-value = 0.030). Love of the specialty had a huge impact on participants who took their specialization decision after their fourth year from those who took their decision before that (64.5% *vs.* 26.7%, respectively, p-value < 0.001) (Table 3 and Table 4).

Discussion

Although the data from the study had a somewhat low response rate (65.3%), it was consistent with the response rate of previous works [5-7]. It showed some findings that were expected and other findings that were somewhat unexpected. The fifth year of medical school training (medical school training in Kingdom of Saudi Arabia (KSA) is a 6-year bachelor's degree) seems to be the most common year in which students made their career decisions. Understandably, the fifth year is when the

Table 1. *Demographic data of the participants.*

Parameter		*n*	%	Parameter		*n*	%
				Parents highest Education level	Below High School	38	12.9
Gender	Male	108	36.7		High School Graduate	40	13.6
	Female	186	63.3		College - did not graduate	4	1.4
					College - Graduate	151	51.4
					Post Graduate Schooling	61	20.7
				The year in which the subject decided their field of specialization	High School	22	7.5
Collages surveyed	Umm AlQura University - Makkah	72	24.5		firstyear medical school	4	1.4
	Umm AlQura University - Qunfutha	72	24.5		second year medical school	12	4.1
	IbnSina Collage - Jeddah	16	5.4		third year medical school	19	6.5
	AlBatarjee Collage - Jeddah	18	6.1		fourth year medical school	48	16.3
	King AbdulAziz University - Jeddah	53	18.0		fifth year medical school	69	23.5
	King Saud bin AbdulAziz University - Jeddah	5	1.7		sixth year medical school	51	17.3
	Taif University - Taif	58	19.7		Internship	44	15.0
					After Internship	3	1.0
					Other	22	7.5

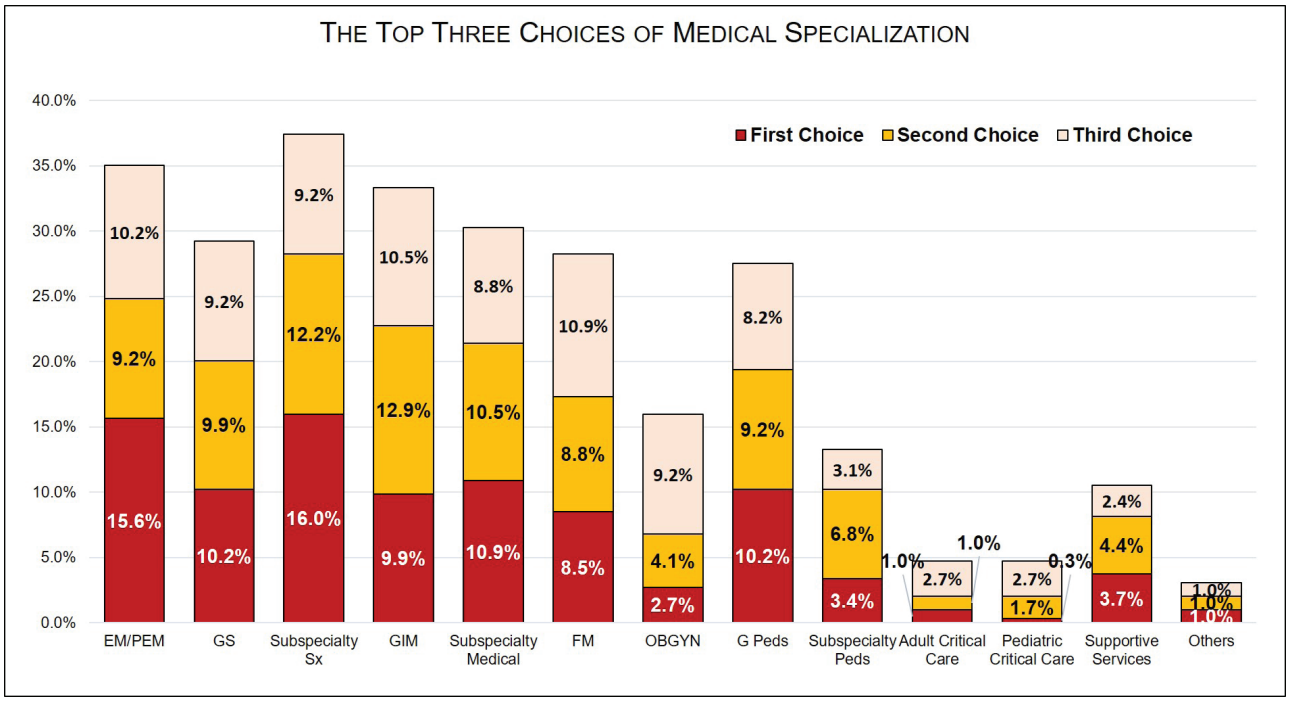

Figure 1. *Top three choices of medical specialization among the participants.*

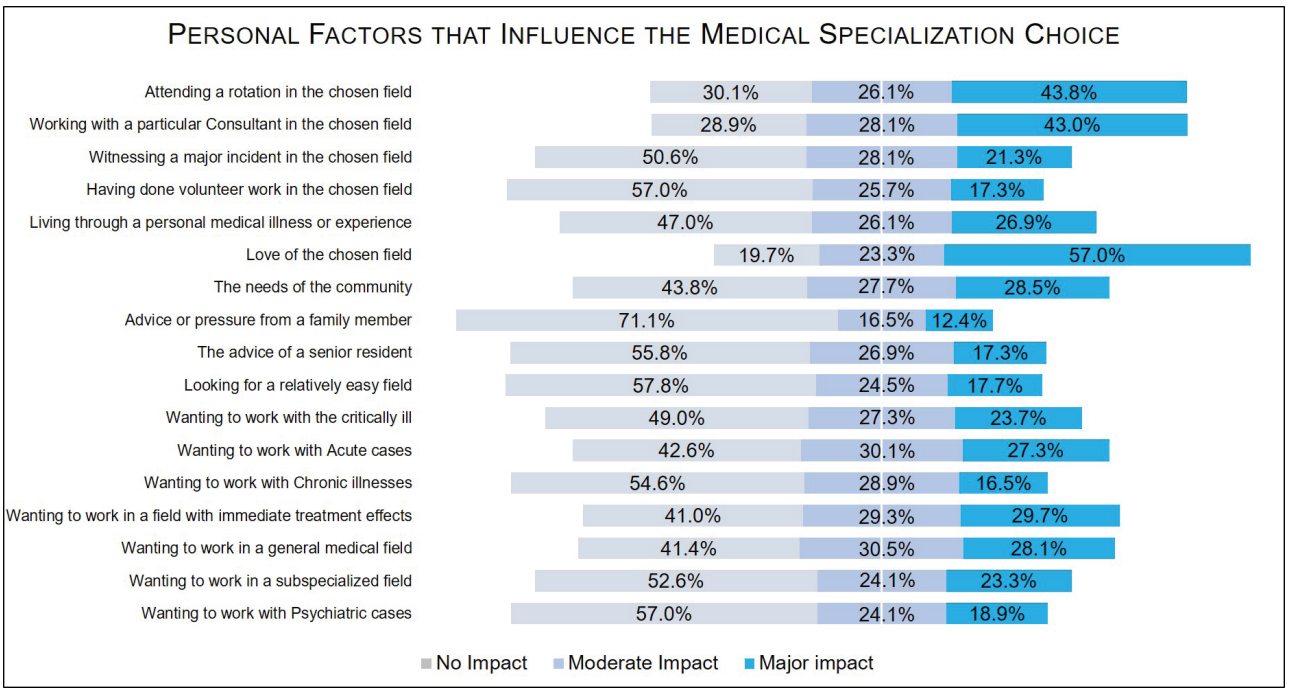

Figure 2. *Personal factors that influence the medical specialization choice.*

students are in full swing of the clinical years of medical teaching and are being rotated through the majority of specialties, where they are exposed to the type of cases seen in the different specialties. Having said that, the current study data showed that 19.5% of students had made their sub-specialization selection in the pre-clinical years before experiencing clinical teaching.

The most commonly chosen specialties as a first choice for specialization were surgical subspecialties (Urology, Plastic, Vascular, Orthopedic, Cardiothoracic, Pediatric, Maxillofacial, Otolaryngology, Ophthalmology, and Neurosurgery). This was followed by Emergency Medicine and in third place by medical sub-specialties (including Cardiology, Nephrology, Geriatrics, Neurology, Rheumatology, Immunology, Gastroenterology, Endocrinology, Hematology, Oncology, Pulmonology, and Infectious diseases). On further subgroup analysis (SGA) concerning gender, we found that male students' top three choices were surgical subspecialties, Emergency Medicine, and Family Medicine. The top three choices of

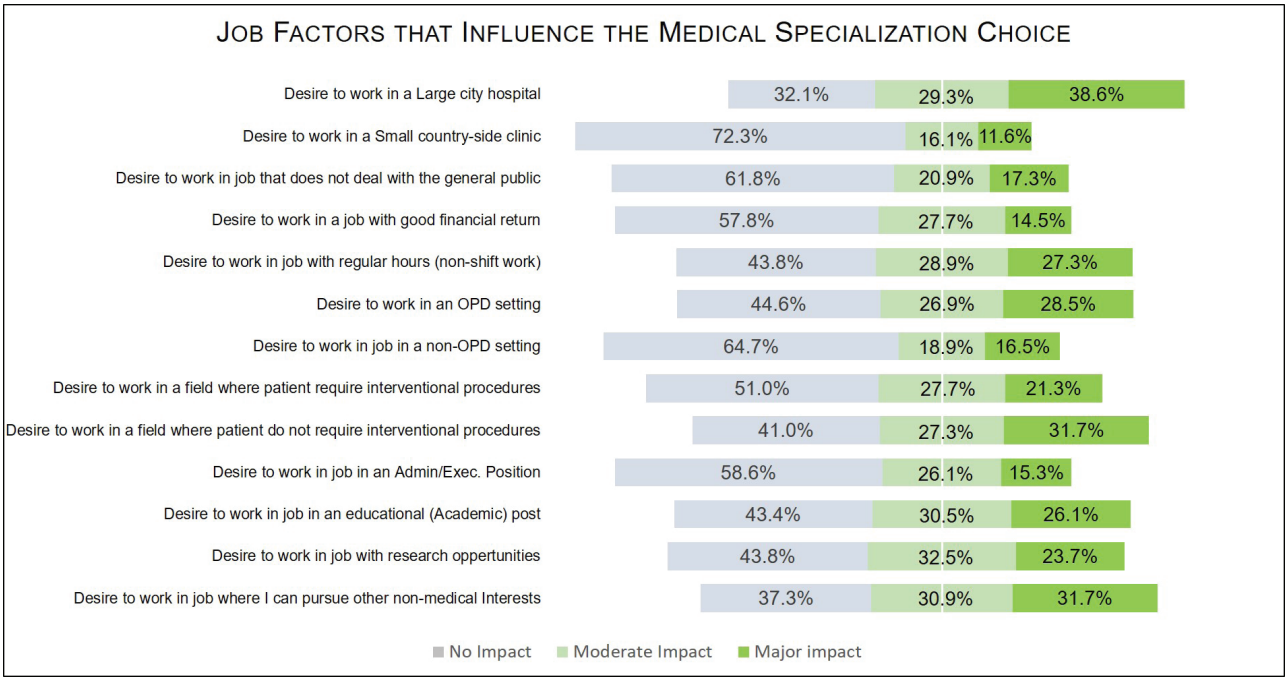

Figure 3. *Job factors that influence the medical specialization choice.*

Table 2. *Specialty preference.*

Field of Specialty	1st Choice		2nd Choice		3rd Choice	
	n	%	*n*	%	*n*	%
Emergency medicine / PEM	46	15.6	27	9.2	30	10.2
General surgery	30	10.2	29	9.9	27	9.2
Surgical sub-specialties ‡	47	16.0	36	12.2	27	9.2
General internal medicine	29	9.9	38	12.9	31	10.5
Medical sub-specialties ♣	32	10.9	31	10.5	26	8.8
Family medicine	25	8.5	26	8.8	32	10.9
Obstetrics and gynecology	8	2.7	12	4.1	27	9.2
General pediatrics	30	10.2	27	9.2	24	8.2
Pediatric sub-specialties §	10	3.4	20	6.8	9	3.1
Adult critical care	3	1.0	3	1.0	8	2.7
Pediatric critical care	1	0.3	5	1.7	8	2.7
Supportive services ¥	11	3.7	13	4.4	7	2.4
Others ʁ	3	1.0	3	1.0	3	1.0

PEM = Pediatric Emergency Medicine; **(‡)** = Urology, Plastic, Vascular, Orthopedic, Cardiothoracic, Pediatric, Maxillofacial, Otolaryngology, Ophthalmology, and Neurosurgery. **(♣)** = Cardiology, Nephrology, Neurology, Rheumatology, Immunology, Gastroenterology, Endocrinology, Hematology, Oncology, Geriatrics, Pulmonology, and Infectious diseases. **(§)** = Ped. Cardiology, Ped. Nephrology, Ped. Neurology, Ped. Rheumatology, Ped. Immunology, Ped. Gastroenterology, Ped. Endocrinology, Ped. Hematology. **(¥)** = Radiology, Interventional Radiology, Radiotherapy, Pathophysiology, Transfusion medicine, Transportation medicine, Disaster medicine, Pharmacy **(ʁ)** = Epidemiology, Research, Medical Education.

female students were surgical subspecialties, Emergency Medicine, and General Pediatrics (p-value = 0.33).

A shift in the preference of female students was observed towards surgical specialties and critical care more than previously noted in international studies, where traditionally surgical and critical fields were, and remain to this day, male dominated wherein female students tend to prefer Family Medicine and Pediatrics. This is in concordance with the progressive changes made in the country over the last 5–10 years concerning female inclusion in the workforce in the kingdom. This finding was similar to the findings of Mehmood et al. [9], but contrary to other studies that showed preferences to be different in different regions of the Kingdom [5-8].

In the current study, it was found that the most influential factor for the choice of specialty chosen by medical students was the love of the field of specialization (57%). The second and third most influential factors were rotation in the desired field and working with a consultant in the desired field (43.8% and 43%, respectively). Waddah et al and Eze et al. [8,11] similarly observed that the most impacting factor for career choice was the medical student loving the field. In contrast, Alshahrani et al. and Newton et al. [6,12] noted that the most influential factors were

Table 3. *Sub-group analysis of specialty preference with respect to gender.*

Field of Specialty	Gender	1st Choice		2nd Choice		3rd Choice		*p* value
		n	%	*n*	%	*n*	%	
Emergency medicine / PEM	Males	12	12.4	10	10.3	12	12.4	0.76
	Females	23	15.1	11	7.2	16	10.5	
General surgery	Males	9	9.3	10	10.3	7	7.2	0.60
	Females	17	11.2	13	8.6	16	10.5	
Surgical sub-specialties ‡	Males	21	21.6	14	14.4	23	23.7	0.23
	Females	35	23	41	27	32	21.1	
General internal medicine	Males	11	11.3	17	17.5	9	9.3	0.19
	Females	13	8.6	18	11.8	13	8.6	
Medical sub-specialties ♣	Males	11	11.3	12	12.4	9	9.3	0.69
	Females	18	11.8	14	9.2	14	9.2	
Family Medicine	Males	14	14.4	11	11.3	10	10.3	0.12
	Females	8	5.3	13	8.6	18	11.8	
Obstetrics and gynecology	Males	2	2.1	5	5.2	3	3.1	0.16
	Females	4	2.6	4	2.6	18	11.8	
General pediatrics	Males	6	6.2	5	5.2	8	8.2	0.11
	Females	21	13.8	13	8.6	11	7.2	
Pediatric sub-specialties §	Males	3	3.1	3	3.1	3	3.1	0.30
	Females	4	2.6	12	7.9	5	3.3	
Adult critical care	Males	1	1	1	1	4	4.1	0.59
	Females	2	1.3	1	0.7	4	2.6	
Pediatric critical care	Males	0	0	0	0	4	4.1	0.54
	Females	1	0.7	5	3.3	3	2	
Supportive services ¥	Males	6	6.2	7	7.2	3	3.1	**0.03****
	Females	4	2.6	6	3.9	1	0.7	
Others ʁ	Males	1	1	2	2.1	2	3.1	0.30
	Females	2	1.3	1	0.7	1	0.7	

PEM = Pediatric Emergency Medicine; **(‡)** = Urology, Plastic, Vascular, Orthopedic, Cardiothoracic, Pediatric, Maxillofacial, Otolaryngology, Ophthalmology, and Neurosurgery; **(♣)** = Cardiology, Nephrology, Neurology, Rheumatology, Immunology, Gastroenterology, Endocrinology, Hematology, Oncology, Geriatrics, Pulmonology, and Infectious diseases; **(§)** = Ped. Cardiology, Ped. Nephrology, Ped. Neurology, Ped. Rheumatology, Ped. Immunology, Ped. Gastroenterology, Ped. Endocrinology, Ped. Hematology; **(¥)** = Radiology, Interventional Radiology, Radiotherapy, Pathophysiology, Transfusion medicine, Transportation medicine, Disaster medicine, Pharmacy; **(ʁ)** = Epidemiology, Research, Medical Education. ** = Statistically significant.

Table 4. *Sub-group analysis of personal a future job factors influencing specialty choice with respect to gender.*

personal factors influencing specialty choice	Gender	No impact		Moderate impact		Major impact		*p* value
		n	%	*n*	%	*n*	%	
Attending a rotation in the chosen field	Males	32	33.3	21	21.9	43	44.8	0.33
	Females	43	28.3	43	28.3	66	43.4	
Working with a particular Consultant	Males	18	18.8	41	42.7	37	38.5	**< 0.001****
	Females	53	34.9	29	19.1	70	46.1	
Witnessing a major incident in the chosen field	Males	54	56.3	28	29.2	14	14.6	0.24
	Females	71	46.7	42	27.6	39	25.7	
Having done volunteer work in the chosen field	Males	56	58.3	23	24.0	17	17.7	0.94
	Females	86	56.6	40	26.3	26	17.1	
Having a personal medical illness or experience	Males	50	52.1	23	24.0	23	24.0	0.59
	Females	66	43.4	42	27.6	44	28.9	
Love of the chosen field	Males	27	28.1	33	26.0	44	45.8	**0.03****
	Females	21	13.8	33	21.7	98	64.5	
The needs of the community	Males	47	49.0	27	28.1	22	22.9	0.29
	Females	61	41.8	36	24.7	49	33.6	
Advice or pressure from a family member	Males	68	70.8	17	17.7	11	11.5	0.51
	Females	108	71.1	24	15.8	20	13.2	
The advice of a senior resident	Males	54	56.3	27	28.1	15	15.6	0.88
	Females	84	55.3	40	26.3	28	18.4	

Continued

personal factors influencing specialty choice	Gender	No impact		Moderate impact		Major impact		*p* value
		n	%	*n*	%	*n*	%	
Looking for a relatively easy field	Males	57	59.4	28	29.2	11	11.5	0.19
	Females	87	57.2	32	21.1	33	21.7	
Wanting to work with the critically ill	Males	48	50.0	29	30.2	19	19.8	0.45
	Females	73	48.0	39	25.7	40	26.3	
Wanting to work with Acute cases	Males	38	39.6	34	35.4	24	25.0	0.16
	Females	68	44.7	41	27.0	43	28.3	
Wanting to work with Chronic illnesses	Males	51	53.1	32	33.3	13	13.5	0.74
	Females	84	55.3	40	26.3	28	18.4	
Wanting to work in a field with immediate treatment effects	Males	41	42.7	31	32.3	24	25.0	0.49
	Females	61	40.1	42	27.6	49	32.2	
Wanting to work in a general medical field	Males	41	42.7	26	27.1	29	30.2	0.64
	Females	62	40.8	49	32.2	41	27.0	
Wanting to work in a subspecialized field	Males	55	57.3	22	22.9	19	19.8	0.19
	Females	75	49.3	38	25.0	39	25.7	
Wanting to work with Psychiatric cases	Males	54	56.3	26	27.1	16	16.7	0.66
	Females	87	57.2	34	22.4	31	20.4	
Future Job factors influencing specialty choice	**Gender**	**No impact**		**Moderate impact**		**Major impact**		***p* value**
		n	**%**	***n***	**%**	***n***	**%**	
Desire to work in a Large city hospital	Males	34	35.4%	29	30.2%	33	34.4%	0.61
	Females	46	30.3%	44	28.9%	62	40.8%	
Desire to work in a small country-side clinic	Males	66	68.8%	18	18.8%	12	12.5%	0.56
	Females	114	75.0%	22	14.5%	16	10.5%	
Desire to work in job that does not deal with the general public	Males	61	63.5%	18	18.8%	17	17.7%	0.80
	Females	93	61.2%	33	21.7%	26	17.1%	
Desire to work in a job with good financial return	Males	54	56.3%	30	31.3%	12	12.5%	0.59
	Females	90	59.2%	39	25.7%	23	15.1%	
Desire to work in job with regular hours (no shift work)	Males	38	39.6%	36	37.5%	22	22.9%	0.21
	Females	70	46.1%	36	23.7%	46	30.3%	
Desire to work in an OPD setting	Males	41	42.7%	32	33.3%	23	24.0%	0.33
	Females	69	45.4%	35	23.0%	48	31.6%	
Desire to work in job in a non-OPD setting	Males	57	59.4%	22	22.9%	17	17.7%	0.07
	Females	103	70.5%	25	17.1%	24	16.4%	
Work with patients that require interventional procedures	Males	37	38.5%	31	32.3%	28	29.2%	0.31
	Females	65	42.8%	37	24.3%	50	32.9%	
Work with pts that DO NOT require interventional procedures	Males	49	51.0%	25	26.0%	22	22.9%	0.93
	Females	77	50.7%	44	28.9%	31	20.4%	
Desire to work in job in an Admin/Exec. Position	Males	55	57.3%	29	30.2%	12	12.5%	0.50
	Females	91	59.9%	36	23.7%	25	16.4%	
Desire to work in job in an educational post	Males	45	46.9%	26	27.1%	25	26.0%	0.77
	Females	62	40.8%	50	32.9%	40	26.3%	
Desire to work in job with research opportunities	Males	45	46.9%	31	32.3%	20	20.8%	**0.018****
	Females	63	41.4%	50	32.9%	39	25.7%	
Desire to work in job with research opportunities	Males	38	39.6%	34	35.4%	24	25.0%	0.26
	Females	54	35.5%	43	28.3%	55	36.2%	

** = Statistically significant.

the controllability of lifestyle and financial incentives. The factors that students said did not play any major part in their choice of specialty were the pressure of a family member or being interested in taking up the specialty due to easy residency (71.1% and 57.8%, respectively).

Regarding job attributes that had a major impact on the choice of career for the current study sample, working in a large city hospital was the most commonly chosen attribute (38.6%), followed by the ability to pursue non-medical interests (i.e., a controllable lifestyle) (31.7%). Surprisingly, good financial gain was not one of the top three choices that had a major impact on the career choice for medical school students in the current study sample. This of course could be because most of

them (91%) were unmarried, and thus did not come to face the challenges of financial responsibilities. Yet another reason that would explain this finding, which differs from the results found in the West [12], is that the medical school in KSA is mainly state-supported. As such, medical graduates completing their education and entering residency programs do not have the same educational debts that medical students in Europe and North America incur.

This study had the following limitations. The study was conducted in seven medical schools; however, the majority of the sample was from UQU, TU, and KAAU, making up approximately 88% of the total sample. As such, private colleges did not have proper presentations in the current study. Furthermore, SGA was not possible between private and public medical schools because of the improper representation of private schools in the study sample.

Conclusion

The most popular specialty chosen by both sexes was a surgical specialty, followed by emergency medicine. This seems to be region-specific, as previous studies showed different specialties to be popular in different regions of the kingdom. The factor with the most impact on the choice of specialty was the love of the field, and the desire to choose a field that would lead to a job in a large city hospital, and a job with a good financial gain was not an impact factor in the choice of career for the current study sample.

List of Abbreviations

KAAU	King Abdulaziz University
KSA	Kingdom of Saudi Arabia
SGA	Subgroup Analysis
TU	Taif University
UQU-M	Um AlQura University-Makkah
UQU-Q	Um AlQura University- AlQunfutha

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent to Participate

Informed consent was obtained from all the participants.

Ethical approval

Approval for this study was provided by the IRB committee of Umm AlQura University via reference number HAPO-02-K-012-2021-06-690 on 18th January 2022.

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