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RESEARCH ARTICLE

SPECIALTY PREFERENCES AMONG MEDICAL STUDENTS IN RIYADH CITY.

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Abstract

Background: Specialty selection is crucial for medical students in order to meet the demands of Ministry of Health. This study profiles the specialty preferences of undergraduate medical students in Riyadh city and the factors influencing them.

Methods: We conducted a cross-sectional study on 387 undergraduate medical students in three medical colleges (College of Medicine Al Imam Mohammad Ibn Saud Islamic University, College of Medicine King Saud University and College of Medicine Al Maarefa Colleges for Science & Technology) in Riyadh city. The study was conducted during April and June 2014. Using a validated electronically-administered structured questionnaire, we collected data on demographic characteristics and specialty preferences of consenting students. Students also indicated the motivational factors underlying their preferences via responses to a Likert-type scale. We used Chi-square and t-tests to examine relationships between data types.

Results and Discussion: All participants were clear about their specialty preference. Career specialty preferences of the participants are as follows: 90 (23.3%) participants chose surgery, 49 (12.7%) selected internal medicine, 38 (9.8%) students preferred cardiology, 32 (8.3%) each opted for neurology and ophthalmology, 26 students selected pediatrics while 18 (4.7%) each expressed interest in orthopedics and psychiatry, 16 (4.1%) students desired to pursue family medicine, and 15 (3.9%) students desired to pursue emergency medicine. Radiology was the least preferred specialty, with only 10 (2.6%) of the respondents indicating an interest. Gender did not appear to have a significant effect on career preferences of participants in our study. Students' GPA scores had a significant influence on their specialty choices ($p < 0.01$). Personal interest, desire to serve the people, future job opportunities, prospects for high income and earlier rotations in the specialty ranked high as motivational factors for selection of career choices of the participants.

Conclusions: Surgery, internal medicine, cardiology, neurology, and ophthalmology are the most preferred career specialties of medical students in Riyadh city. Students' choice of subject is mostly

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influenced by personal interests, interest to serve, prospects for job and high income, and earlier learning experience.

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Introduction:-

Most medical students after graduation desire to pursue higher studies. However, they often find it difficult to choose a medical specialty, and their preferences often change considerably during their years of learning and clinical training [1].

Strong motivation is an essential requirement for the medical students to maintain patience and achieve professional success. Preference for a set of specialties is often a strong motivation to pursue medicine. Many other factors, including demographic characteristics, medical school ethos and curriculum, as well as students' perceptions, attitudes and values, potentially influence the medical students' career plans regarding specialties [2-6]. Their decision may also be influenced by suggestions from their peers, perception about competition in the field, job opportunities, family expectations, marital status, and prospects for teaching and research in medical colleges, and the opportunity to practice overseas.

So far, there have been only a few systematic studies on the medical students' preferences for specialties and the motivational factors underlying them. Information from such studies can help the students make optimal choices and prepare for the expected career transitions. These studies can also yield important data regarding training and manpower requirement across medical specialties. No prior study has investigated these aspects of medical education in the Riyadh city; hence, the present study attempts to fill in this gap.

Methods:-

We performed a cross-sectional study on 387 medical students from three Medical Colleges (College of Medicine Al Imam Mohammad Ibn Saud Islamic University, College of Medicine King Saud University and College of Medicine Al Maarefa Colleges for Science & Technology), during the months of April and June 2014. The students' participation was solicited via e-mail, and they were administered a validated structured questionnaire using online survey and a maintenance platform called SurveyMonkey. We calculated the sample size from 2507 undergraduate students by using survey system website with a confidence level of 95% and confidence interval of 5. The questionnaire included items on demographic data and sought students' preferences from a list of 13 specialties, such as Cardiology, Dermatology, Ear, Nose & Throat (ENT), Emergency Medicine (ER), Family Medicine, Internal Medicine, Neurology, Ophthalmology, Orthopedics, Pediatrics, Psychiatry, Radiology, and Surgery. The respondents were instructed to write down their preference if it was not listed among the options. Students also indicated the degree to which 19 statements (developed after extensive literature review and interviews with medical students, interns, residents and educational experts) influenced their first preference. The students scored the responses on a 5-point Likert scale (ranging from 1, strongly disagree to 5, strongly agree).

Data analysis:-

We analyzed the data using IBM SPSS 22.0 (IBM, Chicago, IL, USA). Descriptive statistics and bar charts were used to represent data, and the Chi-square test was used to examine the relationship between categorical variables. Dimensions of Likert-type responses to statements were evaluated using the t-test. The values of p less than 0.05 were considered significant, and a confidence interval of 95% was calculated for each test.

Results:-

Demographic findings:-

The demographic and academic data of the participants are presented in Table 1. A total of 387 students (233 females and 154 males) were included in the study. A majority of the participants (236; 61%) were aged between 20 to 22 years of age, and only 2.

Participants(0.5%) were aged 25 years or older. The mean age of the participants in the study was 22 years. Of the respondents, 113 (29.2%) were first-year students, followed by 84 (21.7%) participants in the third year. Regarding the marital status, a majority of the participants (347; 89.7%) were single and lived with their family while only 8 (2.1%) participants were married. The assessment of the GPA scores revealed that 195 (50.4%) participants had scored 4.5 or higher, followed by 115 (29.7%) who had GPA scores between 4-4.5. Only 17 (4.4%) participants had GPA scores less than 3.

Table 1:- Demographic and academic details of the participants

Criterion	Category	Number	Percentage
Gender	Male	233	60.2
	Female	154	39.8
Age in years	Less than 20	55	14.2
	20 to 22	236	61.0
	22 to 25	94	24.3
	More than 25	2	0.50
Year of study	First	113	29.2
	Second	72	18.6
	Third	84	21.7
	Fourth	60	15.5
	Fifth	58	15.0
Marital status	Married	8	2.10
	Single, living alone	22	5.70
	Single, living with family	347	89.7
	Single, living with friends	10	2.60
Student's Grade Point Average	Less than 3.00	17	4.40
	3.00-3.99	60	15.5
	4.00-4.50	115	29.7
	More than 4.5	195	50.4

With respect to the specialty preferences of the participants (Table 2), it was found that Surgery was the most preferred specialty among the participants (90; 23.3%), followed by Internal Medicine that was opted by 49 (12.7%) students. The least preferred specialty was Radiology as only 10 (2.6%) participants opted for it.

Table 2:- Specialty preferences of the study participants

Specialty	Number of students preferring the specialty	Percentage
Cardiology	38	9.8
Dermatology	31	8.0
Ear, Nose & Throat (ENT)	15	3.9
Emergency Medicine (ER)	12	3.1
Family Medicine	16	4.1
Internal Medicine	49	12.7
Neurology	32	8.3
Ophthalmology	32	8.3
Orthopedics	18	4.7
Pediatrics	26	6.7
Psychiatry	18	4.7
Radiology	10	2.6
Surgery	90	23.3
Total	387	100.0

Next, we investigated whether the students' preferences were influenced by their pre-medical academic performance using a non-parametric Chi-square test with cross-tabulation of the two attributes. The results of this analysis are presented in Table 3. We found a significant association between the student's earlier academic preference and their specialty preference (Chi-square, 66.84 and $p < 0.01$).

Table 3:- Comparison of GPA scores of the respondents with the choice of their specialty.

Preferred specialty	GPA scores of the respondents				
	Less than 3	3.00 to 3.99	4.00 to 4.50	More than 4.50	Total
Cardiology	1	6	7	24	38
Dermatology	1	2	10	18	31
ENT (Ear,Nose& Throat)	0	4	6	5	15
Emergency Medicine (ER)	0	3	4	5	12
Family Medicine	3	5	5	3	16
Internal Medicine	0	4	11	34	49
Neurology	1	3	7	21	32
Ophthalmology	1	3	9	19	32
Orthopedic	0	2	10	6	18
Pediatrics	4	3	11	8	26
Psychiatry	1	7	6	4	18
Radiology	1	2	5	2	10
Surgery	4	16	24	46	90
Total	17	60	115	195	387

We also investigated the gender influences on the choice of academic specialty by the participants. Table 4 depicts the findings from this evaluation. The analysis using Pearson Chi-Square test revealed no significant influence of gender on specialty preference among the participants (Chi-square, 19.1; $p > 0.05$).

Table 4:- Specialty preferences based on gender.

Preferred specialty	No. of respondents		Total number
	Female	Male	
Cardiology	22	16	38
Dermatology	24	7	31
ENT (Ear,Nose& Throat)	7	8	15
Emergency Medicine (ER)	9	3	12
Family Medicine	10	6	16
Internal Medicine	26	23	49
Neurology	20	12	32
Ophthalmology	19	13	32
Orthopedic	5	13	18
Pediatrics	19	7	26
Psychiatry	11	7	18
Radiology	4	6	10
Surgery	57	33	90
Total	233	154	387

Furthermore, we evaluated the students' responses to 19 categories of influencing factors, as the driving factor for their specialty preference. The responses to each criterion on a Likert scale from 1 to 5 were recorded, and the mean scores were calculated. A summary of the findings from this comparison is presented in Table 5.

Table 5. Comparison of the influence of motivational factors in specialty preference

Criterion for specialty preference	Distribution of students' responses				
	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
Friends' advice	31%	36%	20%	12%	1%
Less competition in the field	35%	30%	21%	11%	3%
Future job opportunities	8%	15%	18%	42%	16%
Family expectations	27%	31%	21%	18%	3%
Marital status	27%	26%	28%	15%	4%
Personal interest	1%	2%	2%	20%	75%
Teachers' advice	19%	30%	25%	24%	2%
Teaching opportunities in medical colleges	15%	30%	29%	19%	6%
Shortage of specialists	16%	35%	29%	16%	5%
Desire to practice abroad	9%	24%	24%	29%	15%
Research opportunities in medical colleges	9%	27%	30%	25%	10%
Previous rotation in the specialty	6%	17%	28%	33%	16%
Less work stress	21%	30%	16%	23%	10%
Role model	11%	22%	29%	29%	10%
Social acceptability	21%	29%	19%	24%	7%
Desire to serve people	2%	4%	10%	41%	43%
Prestige of specialty	17%	26%	27%	25%	%
High-income potential	11%	22%	24%	32%	11%
Short period of training	25%	35%	22%	14%	3%

Table 6:- Scores for factors influencing specialty preference

Factor influencing the student's specialty preference	Mean score	SD	Q1	Median	Q3
Friends' advice	2.2	1.0	1	2	3
Lesser competition in the field	2.2	1.1	1	2	3
Future job opportunities	3.4	1.2	3	4	4
Family expectations	2.4	1.2	1	2	3
Marital status	2.4	1.1	1	2	3
Personal interest	4.7	0.7	4	5	5
Teachers' advice	2.6	1.1	2	3	4
Teaching opportunities in medical college	2.7	1.1	2	3	4
Shortage of specialists	2.6	1.1	2	2	3
Desire to practice abroad	3.2	1.2	2	3	4
Research opportunities in medical colleges	3.0	1.1	2	3	4
Previous rotation in the specialty	3.4	1.1	3	3	4
Low work stress	2.7	1.3	2	2	4
Role models	3.0	1.2	2	3	4

Social acceptability	2.7	1.2	2	2	4
Desire to serve people	4.2	0.9	4	4	5
Prestige of the specialty	2.8	1.2	2	3	4
High income potential	3.1	1.2	2	3	4
Short periods of training	2.4	1.1	1	2	3

As depicted in Table 6, the mean scores for the criteria except 'Personal interest', 'Desire to practice abroad', 'Research opportunities in medical college', 'Previous rotation in the specialty', 'Role models', 'Desire to serve people', and 'High income potential' were less than the neutral value of 3.

We also recorded whether the students had a neutral response to the criteria mentioned. In cases where the response was not neutral, it was evaluated whether they agreed or disagreed with the statement, using t-test. The results of this analysis are presented in Table 7.

Table 7:- Comparison of t-test results on the significance of individual motivational factors.

Criterion	Test value	t-score	Degrees of freedom (df)	Significance (2-tailed)	95% Confidence Interval of the Difference		Remarks
					Lower	Upper	
Friends' advice	3	-15.97	386	0.000	-0.94	-0.73	Significant at 1% level; t=-15.97; p<0.01
Less competition in the field	3	-15.03	386	0.000	-0.95	-0.73	Significant at 1% level; t=-15.03; p<0.01
Future job opportunities	3	7.15	386	0.000	0.31	0.54	Significant at 1% level; t = 7.15; p<0.01
Family expectations	3	-10.14	386	0.000	-0.71	-0.73	Significant at 1% level; t=-10.14; p<0.01
Marital status	3	-10.08	386	0.000	-0.70	-0.47	Significant at 1% level; t=-10.08; p<0.01
Personal interest	3	45.81	386	0.000	1.59	1.73	Significant at 1% level; t=45.81; p<0.01
Teachers' advice	3	-7.55	386	0.000	-0.53	-0.31	Significant at 1% level; t=-7.55; p<0.01
Teaching opportunities in medical colleges	3	-5.15	386	0.000	-0.41	-0.18	Significant at 1% level; t=-5.15; p<0.01
Shortage of specialists	3	-7.56	386	0.000	-0.52	-0.31	Significant at 1% level; t=-7.56; p<0.01
Desire to practice abroad	3	2.68	386	0.008	0.04	0.29	Significant at 1% level; t=2.68; p<0.01
Research opportunities in medical colleges	3	0.05	386	0.964	-0.11	0.11	Not significant at 5% level; t = 0.5; p > 0.05
Previous rotation in the specialty	3	6.68	386	0.000	0.27	0.49	Significant at 1% level; t=6.68; p<0.01
Less work stress	3	-4.58	386	0.000	-0.43	-0.17	Significant at 1%

							level; $t=-4.58$, $p < 0.01$
Role model	3	0.70	386	0.482	-0.07	0.16	Not significant at 5% level; $t = 0.70$; $p > 0.05$.
Social acceptability	3	-5.45	386	0.000	-0.47	-0.22	Significant at 1% level; $t=-5.45$; $p < 0.01$
Desire to serve people	3	26.00	386	0.000	1.11	1.29	Significant at 1% level; $t=26.0$; $p < 0.01$
Prestige of specialty	3	-3.45	386	0.001	-0.32	-0.09	Significant at 1% level; $t=-3.45$; $p < 0.01$
High income potential	3	1.50	386	0.135	-0.03	0.21	Not significant at 5% level; $t=1.50$; $p > 0.05$
Short period of training	3	-11.34	386	0.000	-0.75	-0.53	Significant at 1% level; $t=-11.34$; $p < 0.01$

Discussion:-

The paper describes the results of a cross-sectional study on the preference of specialization of medical students in Riyadh city and the factors influencing them.

All students in our study were clear about their preferences for their future specialty. This is in contrast to the findings of several studies that reported students' indecision regarding the specialization for future practice [7-9]. However, our findings are in agreement with the study by Gasiorowski, et al. [10].

Surgery, internal medicine, and cardiology were the three most preferred specialties according to our study, with 23.3%, 12.7% and 9.8% students, respectively, opting for them. This agrees with the findings of several earlier studies [9, 11, 12]. Only less than 5% of the respondents expressed a desire to pursue a specialization in ENT, ER, family medicine, orthopedics, psychiatry, and radiology. Khader et al. [4] had earlier reported that very few medical students preferred to specialize in orthopedics and dermatology.

Our findings revealed a significant influence of earlier academic performance on the choice of specialization taken up by a student (Chi-square, 66.84; $p < 0.01$). Surgery, internal medicine, and cardiology were the top three preferences among students with GPAs ranging from 4.00-4.50 while surgery, pediatrics, and family medicine were the most preferred choices of those with GPAs less than 3 (Table 3). This seems to be in agreement with the findings of Khader, et al. [4]. Studies by Zolaly et al., Mehmood et al., Subba et al. and Alawaad et al. [11-14] suggested gender influences on the career choices of medical students. However, there were no major differences in the preference of specialization subject of the male and female students in our study. This is in consonance with the findings of Dorsey et al. [15] who investigated the career preferences of medical students in the U.S.

'Personal interests', 'desire to serve people', and 'future job opportunities' ranked high as the major influences on career preferences among our students, which is in congruence with the findings from similar studies in other countries [10, 16-20]. This was followed by criteria like the 'potential for high income', 'earlier rotation in the specialty', and 'desire to practice abroad'. Alshahrani et al. [8], in a study on 379 medical students and interns in University of Dammam, Kingdom of Saudi Arabia, identified lifestyle, and not personal interests, had a greater impact on the students' choice of subject specialization.

Individual evaluation of responses scoring less than the neutral value of 3 (using t-test) revealed no significant influence by 'research opportunities in medical colleges', 'role models', and 'high-income potential' on the choice of specialty. Students' lack of interest in research and the lack of inspirational role models are points of concern raised by our study participants that warrant further attention. We observed that lifestyle was not a significant factor

in the choice of a specialty by the medical students, which is in contrast with earlier reports of Newton et al. and Dorsey et al. [2, 15].

In our study, the prestige and social acceptability of the stream of specialization and shorter periods of training had a significant influence on the students' choices. This seems to be in agreement with the earlier reports by Dikici et al., Khader et al. and Mehmood et al. [4, 11, 21].

A significant number of our study participants belonged to the early years of medical education, with insufficient experience of the specialties, which might have influenced the overall results. We suggest that in future, studies should be conducted with a larger number of final-year students, interns and residents to gain more accurate insights.

Overall, the findings from our study seem to agree with the reports from most other countries that surgery, internal medicine, and cardiology are the highly preferred specialties. The scarcity of inspirational role models in medical education and low levels of student interest in medical research also need further investigation.

Competing interests:-

The authors state that they have no competing interests.

Authors' contributions

Abdullah Muqrin Al Muqrin (AM) has formulated the general format of the study. In addition to that, he has also written the result section, the research questions and the statistical analysis.

Rakan Mohammed Khawaji (RK) has participated in the writing of the discussion part and was also part of the literature review team.

Abderrahman Mamoun Khalaf (AK) has participated in the general design of the study along with writing of the methodology section.

Abdullah Dhafer Algarni (AG) participated in the writing of introduction and result section and general design of the study.

Suliman Mohammed Altreriqi (ST) has done extensive literature review and has written the discussion part.

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