Original Research Article



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MEDICAL STUDENTS ATTITUDE TOWARDS INFECTIOUS DISEASE SPECIALTY AND THEIR WILLINGNESS TO TREAT INFECTIOUS DISEASES AS FUTURE PHYSICIANS

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ABSTRACT

Background: Identifying the reasons of medical students' preferences for their future specialties might help in the development of intervention strategies to overcome the shortage of future physicians in some specialties. This study aims to assess medical students' knowledge, exposure, attitude, and interest towards Infectious Disease (ID) specialty as well as their willingness to treat infectious diseases, whether as ID or non-ID future physicians.

Materials and methods: A cross-sectional survey was conducted between 2017-2018 at KSAU-HS in Riyadh, Saudi Arabia using a validated questionnaire completed by 354 medical students. Descriptive statistics were performed, and Chi-square test and analysis of variance (ANOVA) were used to compare variables. The level of statistical significance was declared as P<0.05.

Results: Twenty one percent of the students considered becoming ID physicians in the future. Personal interest, a potential for research, and a wide range of patients with different ages were the most frequently chosen factors for considering ID as a future specialty. High risk of infection, broad spectrum of clinical problems, and high pressure were the most common reasons for disinterest in the specialty. The willingness to treat infectious diseases varied regarding the procedures and the diseases.

Conclusion: In this study, it has been noticed that there is a general lack of interest in ID specialty, which could be due to insufficient exposure. We suggest providing more opportunities for medical students to be engaged in ID specialty, which may help to change the students' attitude, and results in an increasing number of ID specialists in the future.

Keywords: Attitude, infectious diseases, knowledge, medical student, specialty.

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INTRODUCTION

ID physicians provide consultations on appropriate treatment choices, duration of therapy, and route of delivery of infected patient treatments.[1, 2] The importance of ID consultations has been proven in different reduced areas, including in-hospital mortality, intensive care units, and hospital length of stay.[3, 4] In addition, ID consultations provide more appropriate antibiotic prescription, which can cause a antimicrobial reduction in resistance rates.[5,6] ID consultations also have been evident to cause significant reduction in health-care costs.[1] Despite the importance of ID specialty, the number of medical graduates from it as a specialty has been declining which indicates a reduction in the popularity of ID as a career choice, according to statistics from the United States.[7] Even with the increasing number of positions available, the numbers of applicants for ID specialty in the US was 276 in 2014, 254 in 2015, and only 229 in 2016.[8] There are no studies that we are aware of, that examined the causes of this decline or the factors that influenced ID applicants to choose this specialty.

Previous global studies on some specialties have shown that the choice of specialty and clinical job for medical students is a result of a combination of several factors including individual characteristics, [9-12] demographics 11, 14-16, experiences during medical school cultural and background.[10,16-18] Moreover, a study conducted between 1996 and 2002 on 105,157 senior medical students found that more than 55% of medical students' specialty choice was determined by the possibility of having a balanced lifestyle in their future career.[19] Α balanced lifestyle, as

mentioned by this study has the following characteristics: free time for family, personal activities, and avocational pursuits besides flexible work hours.[19]

In Saudi Arabia, relatively few studies have addressed medical students' future professional preference and the factors that are affecting their choices.[20-25] According to these studies, Saudi students were influenced by lifestyle, knowledge, role models, subspecialty choices, and a prior clinical rotation, which positively influenced the specialty choice.[20-25] Income, marital status, work achievements, and good patient treatment outcomes also played a major role in students' choice.[22, 26] No previous studies in Saudi Arabia have explored factors associated with medical students' choice of ID specialty as a future career.

The Saudi adult ID fellowship program was established in 2005, with only nine mentors available at that time. Over the last ten years, the ID program provided trainees with the required knowledge and skills to ensure proper care for patients in Saudi Arabia.[27] The ID faculty has increased over time with 27 fellows involved in training and 20 fellows accepted for 2015.[27] To estimate the future number of applicants for ID specialty over time, factors associated with medical students' perception of ID specialty should be evaluated. This study intends to explore Saudi Arabian medical students' knowledge, exposure, attitude, and interest towards ID specialty as well as their willingness to treat infectious diseases, whether as ID or non-ID future physicians.

MATERIALS AND METHODS: Study design, settings This is a cross-sectional survey-based study. All medical students who completed the premed phase (two years) and have started the medical program, in King Saud bin Abdulaziz University for Health Sciences in Riyadh were included, and there was no exclusion criteria. Using Raosoft with a margin of error of 5%, confidence level of 95%, population size 1100, the optimal sample size is 285. However, we distributed the surveys to 400 students to ensure a better response. The participants were sampled Non-probability using Convenience sampling. The students completed the questionnaire voluntarily. Α informed consent was attached to the survey for the participants to sign. All participants were informed in advance of the objectives of the study. The study was conducted at College of Medicine, King Saud bin Abdulaziz University for Health Sciences in Riyadh, Kingdom of Saudi Arabia. The university is specialized in health and medical sciences. It enrols both high school graduates (stream 1) and bachelor's degree graduates from other health and science specialties (stream 2). The university has two separate campuses for males and females. And it is considered the first public university in the Kingdom of Saudi Arabia and the Middle East region specialized in health sciences.

Data collection method

Self-administered questionnaires were distributed to 400 students who have completed the pre-med phase (two years) and have started the medical program, consent was performed. The questionnaire has 40 items that were divided into six sections. It was specifically designed for this study and its items were obtained and modified after reviewing the literature. The questionnaire was validated by content experts and piloted

to assess its reliability, whereby the overall Cronbach alpha was found to be 0.9. Data were collected between November 2017 and March 2018. The data was collected in a print form while only a small number of questionnaires (13) were answered using an online electronic form and included in the overall analysis. Factors that reflect students' attitudes towards infectious diseases specialty were categorized into five groups (knowledge, exposure, attitude, interest, willingness) according to the ability of items to fit in these categories. Moreover, a category for demographic information was required to be filled by the students in the beginning of the questionnaire.

Data management and analysis

The data was analyzed using Statistical Package for the Social Sciences, version 22. (SPSS). The categorical variables were described as frequency and percentages. The numerical variables were described as mean and standard deviation (SD). A P-value of less than 0.05 was used to declare statistical significance. A Chi-squared test was used to test the association between different categorical variables. Independent sample ANOVA test and post hoc comparisons were used to test the association between the numerical variable (knowledge score) and the batch (year of study).

RESULTS:

A total of 354 students have answered the questionnaire with a response rate of 88.5%. 162 of the respondents (45.9%) were females. Only 74 of students (21%) considered becoming ID physicians in the future. Table 1 shows the baseline characteristics of the participants.

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Knowledge, Exposure, attitude towards Infectious diseases specialty

On assessing the knowledge of the students about ID speciality, 207 (58.6%) of the students knew that they cannot begin into ID specialty after internship and 69 (19.5%) did not think that ID physicians earn more compared to other physicians. Moreover, 289 (82.6%) knew that ID physicians do not treat only acute health problems. There is a statistically significant association between the level of the students (batch) and the knowledge score. Regarding the exposure to ID specialty, most of the students have not been exposed to ID by summer training course (96.4%), extra-curricular lecture (87.0%), conference (93.7%), or research (88.0%). Also, majority of the students and their family members have never received any care from an ID specialist. Table 4 shows the students' exposure to ID specialty. Table 2 shows the questions that were used to assess the knowledge and the exposure of the students.

On assessing the students' attitude to ID specialty, most of the students (51.7%) agreed that ID specialists tend to develop a close doctor-patient relationship and have significant differences in patient management (91.7%). In addition, 311 (88.6%) of the students agreed that ID input to other specialties is valuable, and 148 (42.3%) of them thought that other health professionals appreciate ID specialists. However, 150 (42.4%) of the students thought that the role of ID specialists is underestimated by the general population. Furthermore, 258 (73.7%) of the students thought that even when wearing protective equipment, ID physicians are at a higher risk of infection compared to other specialties. 194 (55.3%) of the students found that the number of ID lectures received from college curriculum is not sufficient. Table 3 shows the students' attitude towards ID specialty.

Interest and Disinterest:

201 (56.9%) of the students found that ID medicine is an interesting specialty. Moreover, 285 (81.4%) found that ID medicine is interesting from a research perspective. Among both female and male students, personal interest in the specialty was the most frequently chosen factor for considering ID as a future specialty; whereas,

Table 1: Baseline characteristics (n=354)

Variable	Category	n	%
Sex	Female	162	45.9
	Male	191	54.1
Academic year	First	95	26.9
	Second	81	22.9
	Third	100	28.3
	Final	77	21.8
Stream	1	297	84.4
	2	55	15.6





Questions	Frequency %	
Knowledge		
I can enter infectious disease specialty directly after internship.	a - <i>a</i> - <i>b</i>	
A. Yes	26(7.4)	
A. No	207(58.6)	
B. I don't know	120 (34.0)	
ID physicians earn more compared to other medical specialties.		
A. Yes	25(7.1)	
B. No	69(19.5)	
C. I don't know	259(73.4)	
ID specialists treat only acute health problems.		
A. Yes	10(2.9)	
B. No	289(82.6)	
Which of the following do you think is one of infectious disease physicians' duties and responsibilities?		
A. Diagnosing and treating infections.	338(95.5)	
B. Performing medical checks for travelers.	237(67.4)	
Exposure	× /	
Received care from an ID physician before.		
A. Yes	25(7.1)	
B. No	277(78.5)	
C. I don't know	51(14.4)	
Family members received care from an ID physician before.		
Å. Yes	74(21.0)	
B. No	175(49.6)	
Taken a summer training course in ID specialty.		
A. Yes	16(4.6)	
B. No	338(96.4)	
Attended an extra-curriculum lecture in ID.		
A. Yes	46(13.0)	
B. No	304(87.0)	
Attended a conference in ID specialty.		
A. Yes	25(7.1)	
B. No	329(93.7)	
Conducted a research on an infectious disease or nathogen?		
A. Yes	42(12.0)	
B. No	311(88.0)	

high risk of infection was the most commonly chosen reason for the disinterest of the specialty. Table 4 shows questions that were used to assess students' interest about ID speciality. Figure 1 shows the reasons for interest in ID as a future specialty. Figure 2 shows reasons of disinterest among those who did not consider ID as future specialty.

Willingness to perform specific procedures for specific infections: 67.1% of the students thought it is not acceptable for physicians to refuse to provide necessary care for infected patients. However, on assessing the students' willingness to perform specific procedures for specific infections as ID or non-ID future doctors, the majority of the students agreed on taking history from HIV and TB patients; whereas, they disagreed on performing physical examination on patients with MERS-CoV and Multi-drug resistant infection. 60.5% of the students agreed on performing surgery on patients with TB. Nevertheless, the majority of the students

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Table 3 Students' attitude towards ID specialty.

Questions:	Frequency (%)		
Attitude			
ID physicians tend to develop a good and close doctor-patient relationship.			
A. Yes	182(51.7)		
B. No	42(11.9)		
C. I don't know	128(36.4)		
ID physicians are able to make significant differences in the management of patients.			
A. Yes	322(91.7)		
B. No	9(2.6)		
C. I don't know	20(5.7)		
ID input to other specialties is valuable.			
A. Yes	311(88.6)		
B. No	10(2.8)		
C. I don't know	30(8.5)		
The role of ID physicians is underestimated by the general population.			
A. Yes	150(42.4)		
B. No	106(29.9)		
C. I don't know	94(26.6)		
ID specialists are under-appreciated by the rest of the medical professionals.			
A. Yes	93(26.6)		
B. No	148(42.3)		
C. I don't know	109(31.1)		
ID physicians at a higher risk of infection in comparison to other specialties even if they			
A Ves	258(73.7)		
B No	55(15.7)		
C I don't know	37(10.6)		
The number of infectious disease lectures received from your college curriculum is enough			
A. Yes	112(31.9)		
B. No	194(55.3)		
C. I don't know	45(12.8)		

disagreed on performing mouth to mouth resuscitation to patients with MERS-CoV. Figure 3 summarizes responses regarding medical students' willingness to perform specific procedures for four infectious diseases (HIV, pulmonary TB, MERS-CoV, and Multi drug-resistant infection).

DISCUSSION

In this study, only 74 of students (21%) considered becoming ID physicians in the future. personal interest in the specialty was the most frequently chosen factor for considering ID as a future specialty. A previous study found that most internal

Table 4 Students' interest in ID specialty

Questions:		Frequency (%)	
Interest	:		
Infectiou	is disease medicine is an		
interesti	ng specialty.		
А.	Yes	201(56.9)	
В.	No	113(32.0)	
C.	I don't know	39(11.0)	
I conside	er becoming an ID physician		
in the fu	ture.		
А.	Yes	74(21.0)	
В.	No	214(60.6)	
C.	I don't know	65(18.4)	
Infectious disease medicine is an			
interestin	ng specialty from a research		
perspect	ive.		
А.	Yes	285(81.4)	
В.	No	33(9.4)	
C.	I don't know	32(9.1)	



Figure 1 Reasons for interest in ID as a future speciality.

medicine graduating residents developed an interest in infectious diseases specialty before residency [28]. Thus, factors associated with choosing a medical specialty can be used to motivate students to choose specialties with an insufficient number of physicians, like infectious diseases. When these factors are identified, they can be used by infectious disease program mentors to enhance the attractiveness of this specialty and to maximize the number of applicants to overcome the shortage of this specialty in the future.

Most of the participants in our study were not exposed to ID specialty, which may explain the lack of interest as future career choice. This finding supports what was reported by the Infectious Diseases Society of America, suggested which is that the decreased interest in ID specialty may be due to the decreased exposure to this field.[29] Also, the lack of exposure to infectious disease physicians has led to fewer chances to be inspired and engaged with infectious disease role models and mentors [29].

In this study, the most common reason for considering ID as a future career among both female and male participants was personal interest. This finding is concurrent with other studies where personal interest was a reason for choosing other specialties [30, 31]. On contrast to other studies[32, 33, 34], the lifestyle was not the main factor for considering ID as a future specialty with only 7% of participants were interested in ID because of the ability to have more leisure



Figure 2 Reasons for disinterest in ID as a future speciality.

Figure 3 Medical students' willingness to perform specific procedures for specific infections



time, and only 6% of them were interested because of low pressure. High income (4%) and social prestige (3%) were not also common reasons for interest in ID, unlike other specialties [35, 36]. Although there is no evidence in the literature suggesting that ID physicians particularly are at a higher risk of infections, a high risk of infection was the most common reason of disinterest among our participants (46%). It is important to note that 73% of participants thought that ID physicians are at a higher risk of infection compared to other specialists, and that may

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also be explained by the lack of exposure to this specialty.

Finally, on assessing medical students' willingness to perform specific procedures for specific infections, our findings showed that the students' willingness is affected by the type of procedure, not the type of infection. Most of the students agreed to take a medical history from different infected patients and also most of them are not willing to perform mouth to mouth resuscitation in different infected patients.

In conclusion, most of the students agreed to treat infected patients. However, they are not interested in ID as a future specialty. This appeared mostly to be due to the belief that ID physicians have higher chances of getting infected, although this has not been proven. Thus, further studies are needed to test this belief. Also, insufficient exposure to the specialty may play a role in the disinterest of the students. We suggest providing more opportunities for medical students to be engaged in ID specialty, which may help to change the students' attitude towards it.

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