

Effect of the COVID-19 pandemic on career perceptions among medical students in (IMSIU)

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Abstract

Background and aim: COVID-19 pandemic has impacted daily activities due to restrictions regarding social distancing. We aim to investigate the effect of withholding clinical rotations and elective rotations caused by the COVID-19 pandemic on career perceptions among medical students in Imam Mohammad Ibn Saud Islamic University (IMSIU).

Design: A cross-sectional study aimed at IMSIU medical students in Riyadh. A questionnaire was distributed in April 2021 through WhatsApp to randomly select medical students from all years except preparatory-year students.

Results: We collected 301 responses. 41.9% reported not starting any clinical rotations, and 38.5% indicated finishing some clinical rotations. Of the total students surveyed, 49.5% indicated that the COVID-19 pandemic influenced their choice of specialty; 48.6% felt that they had discovered new interests, which affected their consideration. In comparison, 40.5% believed that COVID-19 had limited their ability to explore their considered specialty. A total of 63.1% students were concerned about fulfilling their graduation requirements in a

timely manner, and 15.9% thought that they would need an additional year in medical school before applying to residency because of COVID-19.

Conclusion: It was found that most of the students did not complete their clinical rotations or electives. Moreover, we found that the COVID-19 pandemic influenced students' perceptions about their specialty choices after graduation. Most of the students surveyed said their intentions had changed from pursuing specialties that required direct contact with patients to those that did not.

Key words: Medical students, COVID 19, career choice, Residency programs

Introduction

The COVID-19 pandemic had a significant impact on daily activities due to restrictions in terms of social distancing because of the elevated rate of contagion and mortality. Many sectors have been affected, particularly educational sectors, worldwide. In Saudi Arabia, all medical educational institutions had abandoned on-campus teaching as well as hospital clinical rotations for online teaching methods. Online lectures may be able to convey theoretical principles to students. Nevertheless, these online lectures cannot replace clinical and in-field hospital exposure, which may affect students' choices concerning their residency program specialties [1].

The suspension of clinical electives had multiple adverse effects on medical students, either in terms of inadequate clinical exposure or the inability to demonstrate commitment to their specialty of choice in the hospital [2]. Medical student's career choices can be significantly influenced by several factors, such as a student's medical school, ethnic background, and the different learning experiences of first- and last-year medical students [3].

The restrictions imposed by the COVID-19 pandemic had some advantages. Students had more time to participate in other academic activities such as clinical research or organizing online educational activities, thus giving them more opportunities to be more creative in a particular scholarly activity to distinguish themselves among their colleagues [1].

In Saudi Arabia, there is no scholarly work that deals with the effect of COVID-19 on the career choice of medical students. However, one study in the USA demonstrated that a fifth of the average student's residency program choices were affected by the absence of clinical rotations and in-campus teaching [4].

In this study, we aim to investigate the impact of withholding clinical rotations and elective rotations due to the COVID-19 pandemic on career perceptions among medical students in Imam Mohammad Ibn Saud Islamic University (IMSIU), Riyadh, Saudi Arabia.

Methods

Our study design is a cross-sectional one, and the target population is medical students at Imam Mohammad Ibn Saud Islamic University. The medical education system at IMSIU requires seven years of study. The first year is called the preparatory year and it prepares students for entry into medical college or other health specialties, followed by five years of medical education that consists of three years of basic medical sciences and two years of clinical training followed by an internship year. This study targeted medical students in their fifth year and college interns (40), first-year medical students (50), second-year medical students (54), third-year medical students (61), fourth-year medical students (54), fifth-year medical students, and (42) interns.

A questionnaire previously used in another study [4] was modified and used in this study. The online questionnaire was piloted on 20 students to assess the clarity of the questions and the length of the questionnaire from 15/4/2021 to 17/4/2021 in Riyadh using online means (WhatsApp application). Subsequently the questionnaire was fully distributed through WhatsApp application groups from 18/4/2021 to 30/4/2021 to randomly selected medical students from all years except the preparatory year in Imam Mohammad Ibn Saud Islamic University students. Participants in the study were asked about academic year, GPA, completed rotations, completed electives or sub-internships, and were asked to select one or two specialties of interest before and after the COVID-19 pandemic.

Imam Mohammad Ibn Saud Islamic University (IMSIU) has an enrolment of approximately 900 medical students. The calculated minimal sample size with a confidence interval of 95% and a margin of error of 5%, and a response rate of 50% is 284 students. We collected 301 responses that were statistically analyzed using SPSS (Statistical Package for Social Sciences). Continuous variables are presented as mean, standard deviation, and median. Categorical data are presented as numbers and percentages. P-values were considered statistically significant at $p < 0.05$.

Our inclusion criteria are Imam Mohammad Ibn Saud Islamic University medical students, and our exclusion criteria are incomplete questionnaires, preparatory-year students, and medical students in different universities. Students who agreed to participate were asked to sign a written consent form before filling in the questionnaire. The participating student could cease the survey any time they wished. All questionnaires were kept private; no names or other data were recorded.

Results

In this study, we collected 301 responses to our questionnaire where 20.3% of students were in the fourth year while 17.9% were in the third and fifth year, and 16.6% were in the second year. In addition, 42.2% of participants reported having a GPA of 3.75-4.5 and 32.2% had 4.5-5. Furthermore, 41.9% of students indicated not starting any clinical rotations, while 38.5% indicated finishing some of the clinical rotations (Table 1). Students' most frequent medical rotations were pediatrics (72.1%) and 70.5% of students were in internal medicine, followed by ophthalmology, surgery, and orthopedic rotations (Table 2). Moreover, 40.2% of participants indicated that they had completed electives or internships; while 30.1% of participants had not completed any elective. The most popular electives or sub-internships chosen were general surgery (19.7%), emergency medicine (16.4%), and internal medicine (18.0%). See Figure 1.

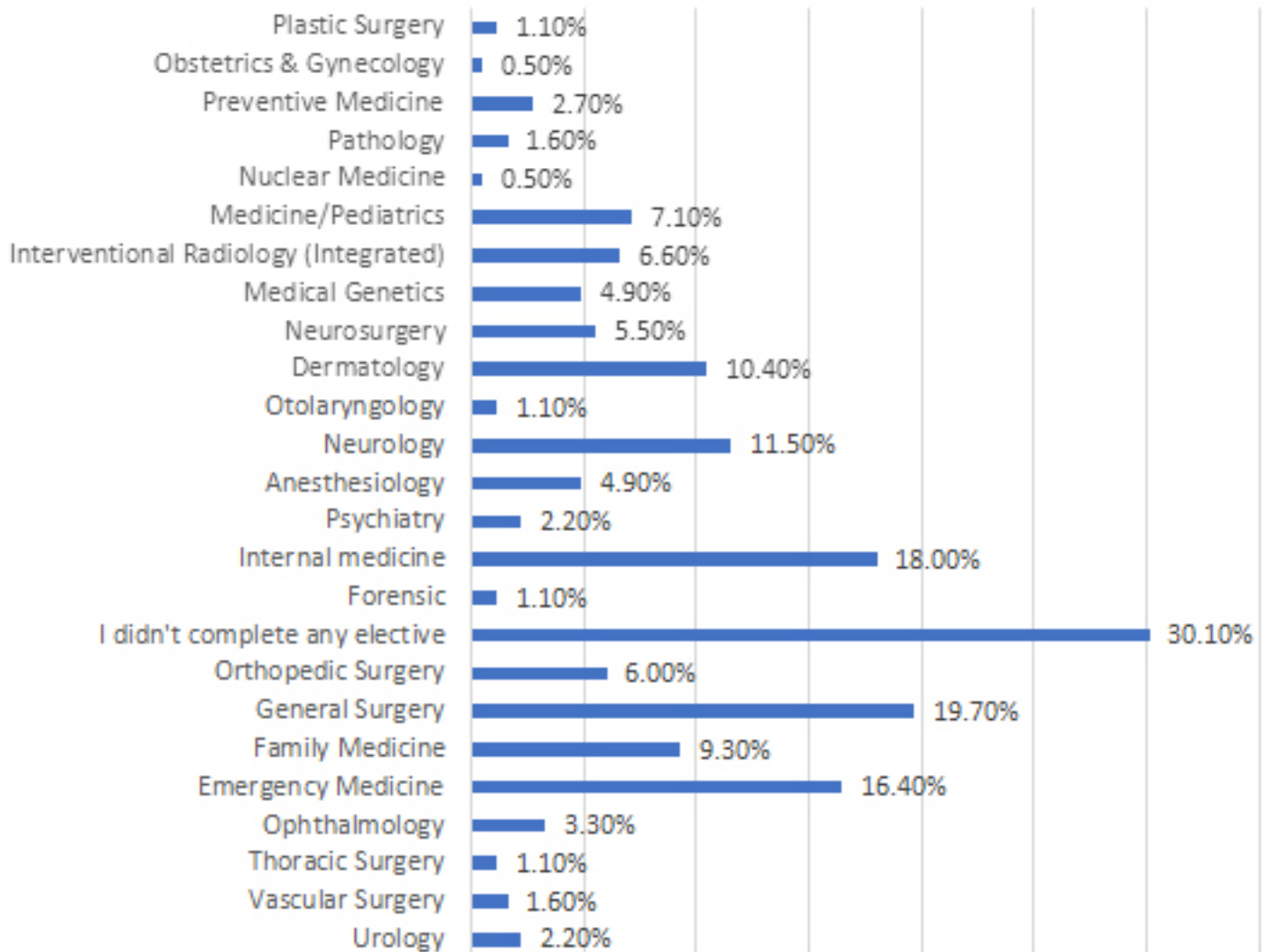
Table 1: General characters of participants

		Count	Column N %
Academic year	First-year	40	13.3%
	Second-year	50	16.6%
	Third-year	54	17.9%
	Fourth-year	61	20.3%
	Fifth-year	54	17.9%
	Intern	42	14.0%
GPA	<2.75	9	3.0%
	2.75-3.75	68	22.6%
	3.75-4.5	127	42.2%
	4.5-5	97	32.2%
Status of completing clinical rotation	I have not started my clinical rotations.	126	41.9%
	I have completed some of my clinical rotations but not all of them.	116	38.5%
	I have completed all of my clinical rotations.	59	19.6%
Have you completed any electives or sub-internships?	Yes	121	40.2
	No	180	59.8

Table 2: The frequency of students taking rotations

Medical rotations	Frequency	Percent
Surgery	118	64.5%
Internal medicine	129	70.5%
OB/Gyn	71	38.8%
Pediatrics	132	72.1%
Family Medicine	90	49.2%
Emergency Medicine	76	41.5%
Dermatology	71	38.8%
Ophthalmology	120	65.6%
ENT	71	38.8%
Orthopedic	103	56.3%
Psychiatry	68	37.2%
Radiology	5	2.7%

Figure 1: Frequency of elective or sub internships



Moreover, the leading specialties considered by participants before the pandemic were internal medicine (26.2%), pediatrics (18.4%), general surgery (16.7%) and dermatology (16.7%). On the other hand, the most popular specialties considered by participants after the pandemic were orthopedic surgery (26.2%), interventional radiology (24.5%), psychiatry (19.6%) and family medicine (15.7%). Furthermore, we found a lower percentage of students whose choice of specialty was the same before and after the pandemic including internal medicine (From 26.2% to 5.9%, $P=0.000$), neurology (from 16 % to 0.7 %, $P=0.000$), general surgery (from 16.7% to 5.9%, $P=0.000$) and dermatology (16.7% to 2.1%, $P=0.000$). On the other hand, orthopedic surgery, which was a specialty considered by 26.2% after the pandemic compared to 9.9% before the pandemic ($P=0.000$) as well as plastic surgery (increased from 4.8% to 15.4%, $P=0.000$), interventional radiology (from 5.4% to 24.5%, $P=0.000$), urology (from 6.1% to 15.4%, $P=0.000$) and psychiatry (from 10.5% to 19.6%, $P=0.003$). See Table 3.

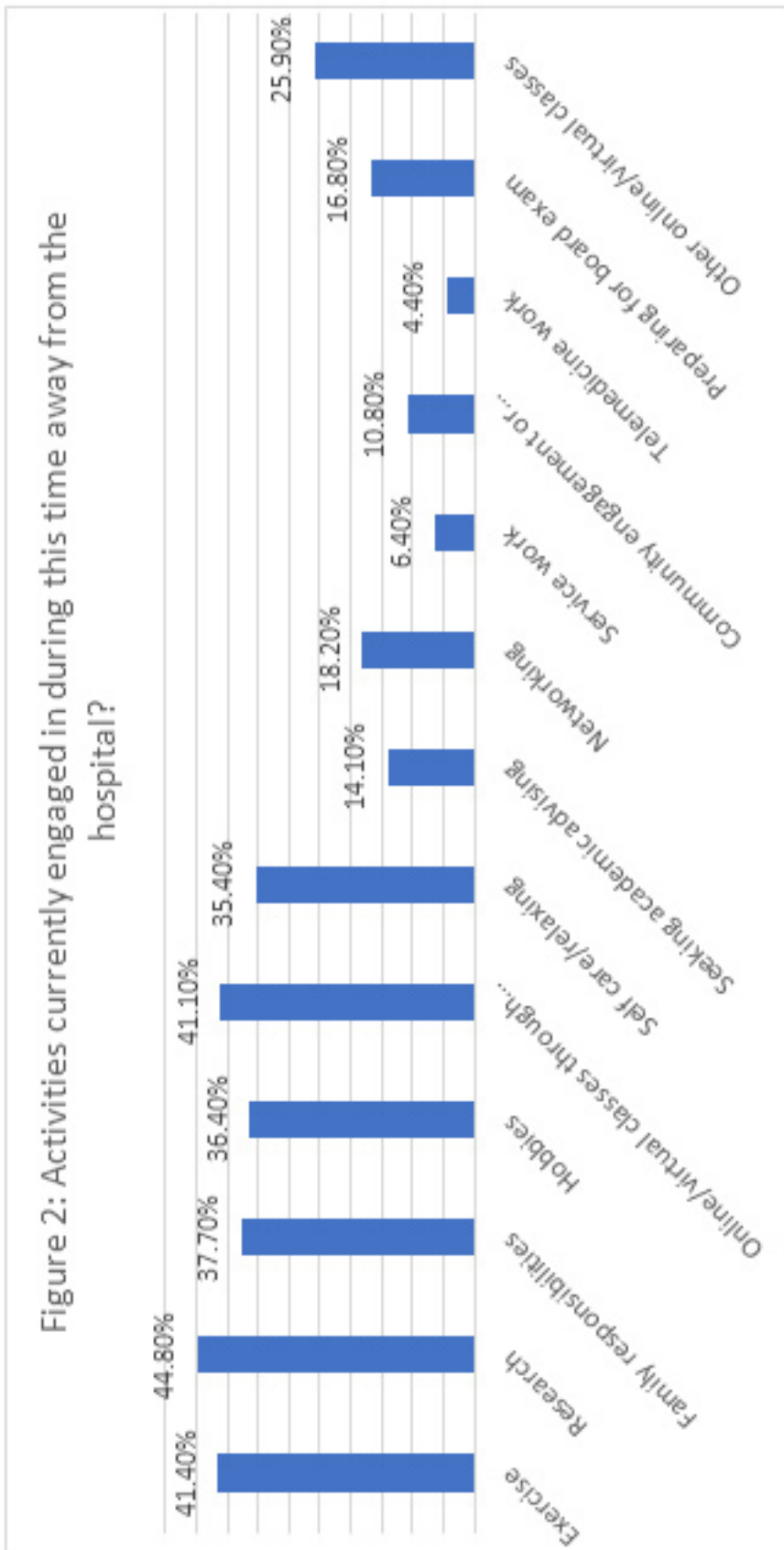
Table 3: The difference between students' perception of specialty before and after the COVID-19 pandemic

	Paired Differences					t	P-value
	Before Pandemic	After pandemic	Mean	95% Confidence Interval of the Difference			
				Lower	Upper		
Preventive Medicine	2.40%	3.10%	-.006	-.032	.019	-4.999	.618
Anesthesiology	6.50%	0.00%	.063	.035	.090	4.496	.000
General Surgery	16.70%	5.90%	.106	.056	.156	4.173	.000
Neurosurgery	11.0 %	0.0 %	.109	.074	.145	6.078	.000
Vascular Surgery	2.0 %	0.0 %	.019	.004	.035	2.470	.014
Dermatology	16.70%	2.10%	.142	.097	.188	6.142	.000
Plastic Surgery	4.80%	15.40%	-.099	-.146	-.052	-4.193	.000
Otolaryngology	10.90%	2.40%	.083	.044	.121	4.223	.000
Physical Medicine & Rehabilitation	1%	5.90%	-.046	-.075	-.017	-3.177	.002
Pathology	8.20%	1.00%	.069	.036	.102	4.14	.000
Thoracic Surgery	3.40%	8.00%	-.043	-.080	-.005	-2.279	.023
Cardiovascular surgery	0.70%	2.10%	-.013	-.031	.005	-1.41	.158
Obstetrics & Gynecology	0.0 %	0.0 %	.059	.032	.086	4.36	.000
Internal medicine	26.20%	5.90%	.199	.146	.252	7.37	.000
Orthopedic Surgery	9.90%	26.20%	-.152	-.212	-.093	-5.04	.000
Medical Genetics	6.80%	8.00%	-.009	-.051	.031	-4.68	.640
Ophthalmology	16.30%	4.90%	.112	.064	.161	4.61	.000
Urology	6.10%	15.40%	-.086	-.134	-.038	-3.54	.000
Emergency Medicine	10.20%	3.10%	.069	.029	.109	3.42	.001
Pediatrics	18.40%	15.40%	.033	-.028	.094	1.06	.287
Psychiatry	10.50%	19.60%	-.083	-.138	-.027	-2.96	.003
Forensic medicine	0.70%	8.40%	-.073	-.104	-.042	-4.64	.000
Neurology	16%	0.70%	.149	.106	.192	6.91	.000
Family medicine	13.30%	15.70%	-.019	-.076	.037	-.68	.492
Interventional Radiology (Integrated)	5.40%	24.50%	-.179	-.233	-.125	-6.52	.000
Radiology (Diagnostic)	4.80%	4.90%	.000	-.033	.033	.00	1.000
Radiation Oncology	2.00%	7.00%	-.046	-.078	-.014	-2.89	.004

Moreover, we found that 49.5% of students indicated that the COVID-19 pandemic affected their choice of specialty; 48.6% of these students thought they had discovered new interests or priorities during the pandemic, which affected their considerations. In comparison, 40.5% believed that COVID-19 had discouraged students from exploring their considered specialty. Moreover, 46.5% of students indicated their mentor had influenced their specialty choice, and 63.1% of students were concerned about fulfilling their graduation requirements on time: 15.9 % of these students thought they would need an extra year in medical school before applying to residency because of COVID-19. The main reason for needing an additional year was that it would increase the likelihood that they would be satisfied with their choice of specialty (Table 4).

Table 4: Factors affecting choice of specialties

		N	N %
Do you think the COVID-19 pandemic will affect your choice of specialty?	Yes	149	49.5 %
	No	152	50.5 %
If you answered "yes" to the above question, how did it affect your choice of specialty?	I may not have the opportunity to explore my specialty or specialties of interest	70	40.5 %
	I have discovered new interests or priorities	84	48.6 %
	I no longer have the ability to bolster my application	19	11.0 %
Did your mentor influence your choice of specialty?	True	140	46.5
	No	161	53.5
Are you concerned about fulfilling your graduation requirements on time?	True	190	63.1
	No	111	36.9
Has the COVID-19 pandemic made you more likely to take an extra year in medical school before applying for residency?	Yes	48	15.9
	No	253	84.1
If you answered "yes," why?	I may not be able to meet my graduation requirements otherwise	9	3.0
	It would make me more likely to be satisfied with my choice	26	8.6
	It would give me more time to explore different specialties	22	7.3
	I want to use the extra year to explore new interests that developed during the pandemic	12	4.0



Furthermore, we found that 58.7% of students were concerned about research, 48% were concerned about taking board exams, and 45.6% of letters of recommendation.

The main activity engaged by students away from the hospital was research (44.8 %), exercise (41.4 %), online classes (41.1 %), and family responsibilities (37.7 %) (See Figure 2).

Discussion

The COVID-19 pandemic has transformed education at all levels, from kindergarten to college. Although preschool and secondary education changes have been well documented [5], very few studies to date have addressed the impact of COVID-19 on university medical education [6]. This study is an early snapshot of medical student qualifications and careers while the COVID-19 pandemic was in full swing and clinical courses were being canceled. Our study found that only 19.6% of students had finished their clinical rotations, while 38.5% had not finished them, and 41.9% had not started clinical rotations. A study conducted by Byrnes Y et al. in USA found that 27.1% of medical students had completed the clinical rotation, 36.3% had partially completed some of the clinical rotation, and 36.6% had not started any clinical rotations [4]. Moreover, in our study, we found that 59.8% of medical students did not complete any electives or sub-internships during the pandemic, which shows the significant impact of COVID-19 on the educational progress of medical students. Interrupted electives or sub-internships reduced the available opportunities for residents to learn about their chosen departments [7,8].

The most frequent medical rotations taken by students were pediatrics and internal medicine (72.1% and 70.5% of students, respectively), followed by ophthalmology, surgery, and orthopedic rotations. Meanwhile, the most completed electives or sub-internships were general surgery (19.7%), emergency medicine (16.4%), and internal medicine (18.0%). Rana T et al.'s study found that 38% of medical students were in internal medicine residency programs, followed by those in surgery (19%) and neurology (16%) [9].

Through the literature review we have found that choosing a medical specialty as a medical student is subject to constant change during their time at medical college and hospital rotations. In a study conducted by Manuel R, the authors found that there was a significant variation between the early preference of medical students for specialties that were person oriented or technique oriented and the later preference of specialty they chose for their residency training [10]. Furthermore, in a study conducted by Jones et al., the authors found that there is an increase in the positive predictive value of top specialty choices of medical students from the end of the first years through to the end of the third year (from 17% to 60% in the first year and 79% to 95% at the end of the third year). The authors of the same study thought that if medical students were exposed to fields of interest during their medical education, then their predictions about specialty fields would be more accurate [11]. However, in most cases, this kind of change takes a long time and extensive experience. Some students may change their opinion about their perceived specialty based on experience gleaned from electives or clinical rotations. [11–13]. Therefore, it was surprising that there was a change in students' opinions about the required specialty (in this short period of less than one and a half years) and that most students reported not completing their clinical rotation or electives. In our study, the main

specialties considered by participants before the pandemic were internal medicine (26.2 %) and pediatrics (18.4%).

Yet the most popular specialties considered by participants after the pandemic were orthopedic surgery (26.2%) and interventional radiology (24.5%). The results of our study showed that students' perceptions of their specialty changed from specialties that require direct clinical contact with patients such as internal medicine and pediatrics to specialties where contacts with patients were not as frequent, such as in orthopedic surgery and radiology. This change could be due to the reduced self-confidence among students, especially after canceling many clinical rotations and electives. The impact of COVID-19 on OSCEs, written examinations, and student assistantships significantly affected student preparedness [6]. Other reasons for this change would be the lack of opportunities to explore specialties of interest, no longer having the ability to bolster applications, and the free time which allows them to discover new interests or priorities. In our study, 48.6% of these students thought they had found new interests or preferences during the pandemic, which affected their consideration. In comparison, 40.5% believed that COVID-19 might limit students' opportunities to explore their considered specialty.

Moreover, our results showed that half the students thought the COVID-19 pandemic had a significant impact on their choice of specialty, which is exceedingly more than one in five students, as shown in the results of Byrnes Y et al [4]. Furthermore, we found that 46.5% of students indicated that they had been affected by their mentor, 63.1% of the students were concerned about fulfilling their graduation requirements in time, and 15.9% of them thought that they needed an extra year in medical school before applying for residency because of COVID-19. The concern about not fulfilling their graduation requirements on time is reported in a previous study [10], while no previous research had investigated whether students would extend their education.

Finally, we found that the main activity engaged in by students away from the hospital was research (44.8%), exercise (41.4%), online classes (41.1%), and family responsibilities (37.7%). In the study of Byrnes Y, the authors found that online classes, self-care, exercise, hobbies, and research were the main activities engaged by students away from hospitals [4].

This study had both limitations and strengths. Our study included some unavoidable limitations that included depending on a self-reported questionnaire. Although this could be a useful tool in collecting large samples, the self-reported questionnaire could lead to some personal bias in which some participants may not be very honest while completing the questionnaire. Moreover, the study was distributed online, which may cause some bias toward students who regularly engage with these groups on social media and may have different traits and perceptions. Conversely, this study is, to our knowledge, the first study to assess the impact of COVID-19 on students' perception of chosen specialty in Saudi Arabia.

Conclusion

We found that most of the medical students did not complete their clinical rotations or electives. Moreover, we found that the COVID-19 pandemic has a significant impact on student perceptions of their specialty choices after graduation. Most of the participants changed their opinion from specialties requiring direct contact to those that did not require direct contact. More investigations should be conducted to understand the effect of clerkship on student choices about their specialties.

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