

Impact of COVID-19 pandemic on urology residency training

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Abstract

Context: The COVID-19 pandemic has led a lot of countries worldwide to go on lockdown. Potential collateral damage is the impact of residency.

Aims: The aim of this study is to assess the impact of COVID-19 pandemic on urology training aspects, study habits of residents, and their awareness and training regarding COVID-19.

Settings and Design: A questionnaire aiming to assess the impact of COVID-19 pandemic on different urology training aspects. The questionnaire was sent to all urology residents under the Saudi Commission for Health Specialties (SCFHS) programs.

Subjects and Methods: Urology residents under SCFHS programs, excluding 1st-year residents. The questionnaire included the following sections: demographic data, studying habits during the pandemic, involvement in training before the pandemic, involvement in training during the pandemic, and training related to COVID-19.

Statistical Analysis Used: Using the SPSS software, frequencies of all data were calculated, and a Wilcoxon-signed rank test was done to assess the change in ordinal data.

Results: A total of 77 residents completed the survey (38% response rate). Most residents (40.5%) reported that they “strongly agree” with the statement that they have more time for reading. There has been a decrease in on-call duties, outpatient visits, diagnostic procedures, endoscopic surgeries urology, minimally-invasive surgeries, and major open surgeries in comparison to before the pandemic, with a decrease in mean scores in all domains, especially in diagnostic procedures.

Conclusions: There has been a decrease in residents’ involvement in all training domains, and this has been similar to the results of other studies. E-learning sources, during these times, present themselves as a valuable source to compensate for what has been missed in training.

Keywords: COVID-19, residency, Saudi Arabia, surgical education, urology

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INTRODUCTION

The novel coronavirus, coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome

coronavirus 2 originated in the city of Wuhan, China, and has spread to over 213 countries to date.^[1] As of the 1st of June, the World Health Organization reported over 6.2

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million confirmed cases over the world with over 374 thousand confirmed deaths.^[2]

On March 2, 2020, Saudi Arabia reported the first case of COVID-19.^[3] Since then, the government implemented strict measures to limit the pandemic. These measures included delaying elective surgeries and limiting the number of health-care personnel to the minimal number needed. These measures were similar to many countries. These measures limit the exposure of residents to surgical cases. A study done in Italy showed a significant reduction in multiple urology training activities.^[4]

We aim to assess the impact of the COVID-19 pandemic on the urology residency training in Saudi Arabia.

SUBJECTS AND METHODS

This is a cross-sectional study that was conducted in April 2020. The study was done by sending a survey to all urology residents in a training program. First-year residents were excluded because they are not involved in any urology service. The survey was sent through the E-mail.

The questionnaire was based on Amparore *et al.*'s study.^[4] It was modified and designed by the authors, as summarized in Table 1. It included the following five sections: demographic data, studying habits during the COVID-19 pandemic, involvement in training before the pandemic, involvement in training during the pandemic, and any training related to COVID-19. Demographic data included age, gender, training center, and level of training. The following section was assessed on a 5-point Likert scale: if the residents had more time to read and how valuable were the e-learning sources provided by their respective programs. Moreover, the residents were asked to provide if they have used new resources to learn urology during the pandemic. Residents' involvement in different training domains was scored on a 5-point Likert scale before and during the COVID-19 pandemic.

In the final section related to COVID-19 education and training, the residents were asked if they have been involved in any institutional training, online resources and if they have been involved in the management of COVID-19 patients.

Institutional ethics board approval was obtained, and informed consent of participation was obtained from respondents before beginning the survey.

Statistical analysis

Data analysis was performed through the SPSS software version 23 (IBM Corp. Released 2015. version 23.0. IBM Corp., Armonk, NY, USA). Frequencies of demographic

data, study habits during the pandemic, and COVID-19 management were described. Wilcoxon signed-rank test was used to assess the residents' score in each training activity before and during the pandemic.

RESULTS

There are 261 trainees currently in Saudi Commission for Health Specialties training programs, and 60 of them were 1st-year residents, who were excluded from the analysis. A total of 77 urology residents completed the survey (77/201, 38% response rate). The mean age was 28.6 years (standard deviation: 2; range 26–37). The majority of the respondents were males (97.4%). Most of the respondents were in training centers in the Western region (39%), followed by the central region (37.7%). Thirty-one (40.3%) residents were in their 2nd year, which is the 1st year in urology exposure [Figure 1]. Table 2 shows the demographic characteristics.

Most residents (40.5%) reported that they “strongly agree” with the statement that they have more time for reading. Two residents (2.7%) reported that their respective programs offered no e-learning resources or activities. Nonetheless, 31 (41.9%) “agreed” with the statement that the e-learning activities provided by their programs are valuable. On the other hand, when residents were asked about any new resources to learn urology during the pandemic, most (54.1%) reported none. Forty (54.1%) of residents reported that they have not had any training in how to manage COVID-19 patients by their institutions. However, 38 (51.4%) used the Ministry of Health resources to learn more about COVID-19, whereas 23 (31.1%) did not use any resources to learn more about COVID-19. Moreover, 52 (70.3%) were not involved in the management of any COVID-19 patients as well. Study habits during the pandemic are summarized in Table 3.

A Wilcoxon signed-ranked test indicated that there has been a statistically significant decrease in on-call duties ($\chi = -4.039$, $P < 0.001$), outpatient visits ($\chi = -4.586$, $P < 0.001$), diagnostic procedures ($\chi = -5.648$, $P < 0.001$), endoscopic surgeries ($\chi =$

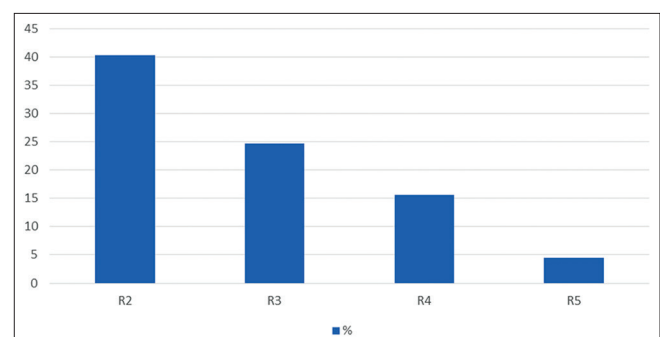


Figure 1: Responding residents' years of training

Table 1: Questionnaire

Item	Options
Demographic data	
Age	
Gender	Male female
Training center	Central western eastern northern southern
Residency year	R2 R3 R4 R5
Study habits	
“I have more time for reading during this pandemic in comparison to before”	Strongly agree agree neutral disagree strongly disagree
“Have you used any new resources to study Urology during the COVID-19 pandemic”	No a website and resources a website and resources other scientific societies others
“In regard to teaching activities, e-learning sources provided to you by your program were valuable (e.g. webinars)”	Strongly agree agree neutral disagree strongly disagree
Prior to COVID-19 pandemic, please mark the activities that you were routinely involved in	
On-call duty	Strongly agree agree neutral disagree strongly disagree
Outpatient visits	Strongly agree agree neutral disagree strongly disagree
Diagnostic procedures (e.g. prostate biopsy, cystoscopy)	Strongly agree agree neutral disagree strongly disagree
Endoscopic surgery	Strongly agree agree neutral disagree strongly disagree
Minimally invasive surgery	Strongly agree agree neutral disagree strongly disagree
Major open surgery	Strongly agree agree neutral disagree strongly disagree
Evaluation of reduction in involvement in different training activities in comparison to the pre-COVID 19 period	
On-call duty	Strongly agree agree neutral disagree strongly disagree
Outpatient visits	Strongly agree agree neutral disagree strongly disagree
Diagnostic procedures (e.g., prostate biopsy, cystoscopy)	Strongly agree agree neutral disagree strongly disagree
Endoscopic surgery	Strongly agree agree neutral disagree strongly disagree
Minimally invasive surgery	Strongly agree agree neutral disagree strongly disagree
Major open surgery	Strongly agree agree neutral disagree strongly disagree
Training related to COVID-19	
“In your institution: have you been involved in any sort of training in how to manage COVID-19?”	Yes no
“Other than your institution: have you used any other resources on how to manage COVID-19?”	No MOH WHO scientific societies
“Have you been involved in the management and covering COVID-19 patients”	Yes no

COVID-19: Coronavirus disease 2019, MOH: Ministry of Health, WHO: World Health Organization

Table 2: Demographic characteristics of participants

Characteristics	Number of participants (%)
Gender	
Male	75 (97.4)
Female	2 (2.6)
Training region	
Central	29 (37.7)
Western	30 (39)
Eastern	11 (14.3)
Southern	6 (7.8)
Northern	1 (1.3)
Training year	
R2	31 (40.3)
R3	19 (24.7)
R4	12 (15.6)
R5	15 (19.5)

-4.793, $P < 0.001$), minimally-invasive surgeries ($\bar{x} = -4.03$, $P < 0.001$), and major open surgeries ($\bar{x} = -3.904$, $P < 0.001$) in comparison to before the COVID-19 pandemic [Table 4]. Table 5 shows a decrease in the mean of all training domains compared to before the pandemic.

DISCUSSION

Since the diagnosis of the first case of COVID-19 in Saudi Arabia, the government implemented regulations to

limit the spread of the virus. These protective measures included the health-care system were elective surgeries were postponed, outpatient visits were limited, and the number of health workers was limited according to need.^[3] These regulations might have an unfavorable outcome on residency training. Amparore *et al.* showed a negative impact of the lockdown on urology residency training in Italy.^[4]

Our study shows that 41.6% of the residents “strongly agree” that they have more time for reading during the pandemic. If residents who “agree” were added the percentage, it increases to 68.9%. Most residents, at least agree, have more time to read and utilize self-development for learning. Similarly, Amparore *et al.* study has shown similar results with most of the residents having at least 2 h/day for smart learning purposes.^[4]

During the pandemic, medical education shifted to web resources worldwide. In the United States, almost all orthopedic surgery residents commonly use web-based resources.^[5] In Saudi Arabia, many webinars were organized in urology. Some of them were organized only for resident education. Others were organized through the Saudi Urological Association and the Saudi Society of Men’s

Health for all urologists. We showed that 68% of the residents “strongly agree” or “agree” that the provided sources were valuable. Given the early success of virtual education, the American Board of Surgery is considering the adoption of these techniques.^[6] After the pandemic, urology training programs in Saudi Arabia are planning to utilize web-based learning based on the many advantages that were observed. The pandemic is an opportunity for resident growth and development through harnessing “noncognitive” skills, such as resilience self-control, and conscientiousness.^[7] Mastering these skills has been associated with surgical resident well-being, lower resident attrition rates, decreased likelihood of burnout as an attending surgeon, and higher overall rates of career satisfaction.^[8-11]

Table 3: Studying habits and coronavirus disease 2019 management

Questions	n (%)
“I have more time to read during this pandemic in comparison to before”	
Strongly agree	32 (41.6)
Agree	21 (27.3)
Neutral	7 (9.1)
Disagree	9 (11.7)
Strongly disagree	8 (10.4)
“Have you used any new resources to learn urology during the pandemic?”	
No	41 (53.2)
AUA website and resources	12 (15.6)
EUA website and resources	5 (6.5)
Other scientific societies	12 (15.6)
Other	7 (9.1)
“E-learning sources provided by your programs were valuable”	
Strongly agree	19 (24.7)
Agree	33 (42.9)
Neutral	20 (26)
Disagree	3 (3.9)
Strongly disagree	0 (0.0)
None were offered	2 (2.6)
“In your institution, have you been involved in any sort of training in how to manage COVID-19?”	
Yes	35 (45.5)
No	42 (54.5)
“Other than your institution: have you used any other resources on how to manage COVID-19?”	
No	23 (29.9)
MOH	41 (53.2)
WHO	9 (11.7)
Scientific societies	4 (5.2)
“Have you been involved in the management and covering COVID-19 patients?”	
Yes	22 (28.6)
No	55 (71.4)

COVID-19: Coronavirus disease 2019, MOH: Ministry of health, WHO: World Health Organization

COVID-19 is projected to surge beyond the capacity of general wards and intensive care units by ten-folds.^[12] Given the substantial burden that the pandemic carries, training surgical residents in basics of critical care becomes a necessity the University of Southern California has trained surgical residents in the basic skills of nursing in critical care. Adopting such a model will both supplement residents’ training and provide back-up for health-care workers providing care for COVID-19 patients.^[13] Moreover, the American College of Surgery acknowledges, that training residents on how to manage COVID-19 patients, will prepare surgical departments for any future crises or emergencies.^[6] We showed that only 46% of the urology residents did undergo formal training related to COVID-19 patients by their institution. Moreover, only 30% of the residents managed COVID-19 patients. We recommend offering mandatory programs during crises to utilize, educate, and protect residents.

Urology clinical training can be divided into on-call duties, outpatient activities, diagnostic procedures (such as cystoscopy and prostate biopsy), endourologic surgery, minimally invasive surgeries, and open surgeries. Given that most of the respondents were 2nd-year residents, on-call duties exposure had the highest mean score before the pandemic, which is similar to what Amparore *et al.*’s study reported.^[4] We found that diagnostic procedures had the highest drop in residents’ involvement during the pandemic. This could be because most diagnostic procedures are not of an urgent nature, and/or that most of the residents who filled up the survey were 2nd-year residents, who are required to master these skills during that year. Similar results were found in Amparore *et al.*’s study, where diagnostic procedure had the highest percent of decrease alongside outpatient activities, in 2nd-year residents.^[4] In our study, major open and minimally invasive surgeries scores were affected the least by the pandemic. This is probably due to that 40% of the respondents were 2nd-year residents, who are not involved heavily in such domains. Nevertheless, we anticipate that the impact on 4th and 5th-year residents is underestimated, as only urgent and emergent cases are done. Moreover, this has been anticipated to happen to other surgical specialties.^[4,14]

In light of the pandemic and its impact on all domains in urology residency training. We recommend the use of web-based technologies to limit the impact on the residents’

Table 4: Wilcoxon-signed Ranks test comparing each training domain to before Coronavirus disease 2019 pandemic

	On-call duty	Outpatient visits	Diagnostic procedures	Endoscopic surgery	Major open surgery	Minimally invasive surgeries
Z	-4.226	-4.527	-5.678	-4.873	-4.030	-3.904
P	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 5: Mean score on a 5-point Likert scale in each training domain prior and during the pandemic

Training domain	Prior to COVID-19	During COVID-19
On-call duties	4.53	3.92
Outpatient visits	3.97	2.99
Diagnostic procedures	4.14	2.92
Endoscopic surgery	3.96	2.87
Major open surgery	3.34	2.52
Minimally invasive surgery	3.19	2.53

COVID-19: Coronavirus disease 2019

learning curve and to consider the continuity of such valuable e-learning sources after the pandemic resolves.^[15] We also recommend assessing again the impact on all training programs retrospectively when the pandemic ends. Training bodies are exploring the possibility of adding more months to residents' training to compensate for the decrease in training. Our study had involved a good number of residents. However, it was constrained with the fact that most of the respondents were 2nd-year residents. The current pandemic has also constrained the possibility of assessing residents' hands-on skills and was possible only through the residents' perception.

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Conflicts of interest

There are no conflicts of interest.

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