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Original Article

Online family medicine training amid the COVID-19 crisis in KSA: A mixed-method study

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الملخص

أهداف البحث: تعتبر الأدبيات حول تصورات وخبرات متدربي ومدربي الدراسات العليا حول أساليب التعلم عبر الإنترنت نادرة. هدف الدراسة هو تقييم تصورات وخبرات المتدربين والمدربين في طب الأسرة حول التعلم عبر الإنترنت خلال جائحة كوفيد ١٩ في منطقة القصيم بالمملكة العربية السعودية.

طرق البحث: اتبعت هذه الدراسة منهجية مختلطة بين المتدربين والمدربين في أكاديمية طب الأسرة، القصيم. تم جمع البيانات الكمية باستخدام استبانات منظمة. تم جمع البيانات النوعية من خلال مقابلات متعمقة مع المتدربين والمدربين. تم إجراء التحليل الوصفي على البيانات الكمية بينما تم إجراء التحليل الموضوعي على البيانات النوعية.

النتائج: شارك في المسح ٣٦ متدربا و٢٦ مدربا. رأى ٣٩٪ من بين المتدربين أن التعلم عبر الإنترنت أقل فعالية. كان حوالي ٦١٪ و٦٤٪ من المستجيبين مهتمين بالتحفيز وجودة التعلم عبر الإنترنت على التوالي. كان عدم الاتصال المباشر مع الطلاب الآخرين هو القلق الأكثر شيوعا بين ٨٠٪ من المتدربين. كان غالبية المدربين، إما غير راضين أو محايدين بشأن المشاركة والتفاعل، تحفيز المتحدثين والطلاب، جودة التعلم عبر الإنترنت وخبرة التدريس عبر الإنترنت. أظهرت البيانات النوعية أن طرق التعلم عبر الإنترنت وفرت ميزة للتعلم حتى من المؤسسات الأخرى، المرونة والبديل أثناء الأزمات. ومع ذلك، كانت هناك مشكلات في التفاعل، المشاركة ومهارات المدربين للتدريس عبر الإنترنت.

الاستنتاجات: أتاح التعلم عبر الإنترنت فرصة لمواصلة التدريب خلال جائحة كوفيد ١٩. ومع ذلك، كانت هناك مخاوف واسعة النطاق حول فعاليته بين المتدربين والمدربين. هناك حاجة لتدريب المدربين على التدريس عبر الإنترنت واعتماد أساليب تفاعلية لزيادة التفاعل، التحفيز ومشاركة المتدربين.

الكلمات المفتاحية: كوفيد ١٩؛ التعلم؛ عبر الانترنت؛ الدراسات العليا للتعليم الطبي؛ التدريس

Abstract

Objective: Literature on the perceptions and experiences of postgraduate trainees and trainers regarding online methods of learning is scarce. We aimed to assess the perceptions and experiences of family medicine trainees and trainers regarding online learning during the novel coronavirus (COVID-19) pandemic in Qassim, KSA.

Methods: This was a mixed-method study involving trainees and trainers at the Family Medicine Academy, Qassim. Quantitative data were collected using structured questionnaires from 36 trainees and 26 trainers. Qualitative data were collected through in-depth interviews with trainees (*n* = 4) and trainers (*n* = 3). Descriptive analysis was performed on the quantitative data, while thematic analysis was performed on the qualitative data.

Results: Among the trainees, 39% perceived online learning to be less effective than traditional classroom learning. Moreover, 61% and 64% of the respondents were concerned about the motivation and quality of online learning, respectively. Lack of direct contact with other students was the most commonly perceived concern among 80% of trainees. Among the trainers, the majority were either dissatisfied or neutral about participation and interaction, speakers' and students' motivation, the quality of online learning, and the online teaching experience. Qualitative data showed that online methods provide the advantages of learning from other institutions and flexibility, as well as a viable alternative during crises. However, there were issues with interaction, participation, and trainers' online teaching skills.

Conclusion: Online learning has provided an opportunity to continue training during the COVID-19 crisis.

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However, there are widespread concerns regarding its effectiveness among trainees and trainers. There is a need to train trainers in online teaching and adopt interactive methods to increase trainees' interaction, motivation, and participation.

Introduction

On 12 March 2020, the World Health Organization (WHO) declared the novel coronavirus (COVID-19) outbreak a pandemic and called for global efforts to contain the infection.[1] To curb the spread of the disease, social distancing was widely promoted globally and nationally in the KSA. This called for changing teaching and learning practices, as well as preventing the spread of the virus among teachers and students.[2,3]

Online teaching, although not new, has become a new norm amid the COVID-19 pandemic.[3] Online teaching methods have been used sporadically in undergraduate and postgraduate medical education in the past. However, COVID-19 has made it the main medium of education.[4] This is new for many of us; therefore, further investigations are required. Traditionally, online learning is perceived to lack interactivity and have lower student satisfaction compared to face-to-face learning. This is mainly because of a lack of social presence and social interaction. However, online learning has been promoted as being more cost-effective and convenient than traditional educational environments and has been lauded for providing opportunities for more learners to continue their education.[5] However, content that might be easily delivered and acquired in the classroom setting may require more probing and questioning in an online course.[6]

Postgraduate medical education requires in-class and bedside teaching, which has to be continued as the training period is specified.[3] In order to continue training family medicine residents during the COVID-19 pandemic, the Family Medicine Academy (FMA) in Qassim adopted online training to facilitate interaction between trainers and residents enrolled at the FMA through videoconferencing and online lectures. Through remote learning, the FMA aimed to overcome social distancing and maintain the continuity of educational activities.

Studies have been conducted to assess students' perceptions and experiences of online learning during the COVID-19 pandemic.[7–12] However, these were mainly conducted among undergraduate students, and teachers' perspectives were not included. Literature on the use of online learning in postgraduate medical programs is scarce in this region. Therefore, we aimed to evaluate the perceptions and experiences of trainees and trainers at the FMA regarding online learning during the COVID-19 pandemic. This will help improve ongoing online teaching in postgraduate medical education and contribute to better preparation to continue training in the future under special circumstances such as amidst disasters or pandemics.

Materials and Methods

Study setting and population

This study was conducted at the FMA in Qassim, KSA. At the time of data collection, there were 62 family medicine residents (also called trainees) and 40 trainers. The FMA in the Qassim region is one of the training institutes for the Saudi Board for Family Medicine awarded by the Saudi Commission for Health Specialties (SCFHS). Family medicine training in the region started in 2013 as a diploma program that was upgraded to a four-year board program in 2017. In 2019, this program was given the status of being offered by an academy. The study population included residents and trainers at the FMA, Qassim.

Study design

This study employed a parallel mixed-methods approach, in which quantitative and qualitative data were collected simultaneously. Quantitative data were collected from the residents and trainers using a structured questionnaire. Qualitative data were collected via in-depth interviews with trainers and trainees, using in-depth interview guides.

Participants' selection

For the quantitative survey, all trainers ($n = 40$) affiliated with the FMA and trainees ($n = 62$) enrolled at the time of survey, under the Saudi Board for Family Medicine and training at the FMA in Qassim were invited to participate.

To collect qualitative data, four trainers who had conducted online sessions during the lockdowns were purposively selected. Each batch (level of training) has a group leader who liaisons with residents and administration on various matters related to training. Group leaders, therefore, have insights into residents' affairs and problems. Therefore, we purposely selected trainee representatives from each training level (Year I [R1], Year II [R2], Year III [R3], and Year IV [R4]) to gain insight into residents' perceptions and experiences of online learning.

Data collection tools and procedures

Data were collected using four instruments. The first two were structured questionnaires used to collect quantitative data from trainees and trainers. The third and fourth were in-depth interview guides used for qualitative data collection from the trainers and trainees. Tools for this study were developed after a literature review.[13–17] The first questionnaire (trainees' questionnaire) had six sections, which included variables related to socio-demographics, perceptions about online learning, concerns with online learning, experiences

with current online sessions, preferences about online learning, and weaknesses of and suggestions to improve the online learning experience. The second questionnaire used to collect data from trainers had both closed- and open-ended questions. There were five sections, namely bio-data, perceptions of online teaching, experience with online teaching during this period, weaknesses of and suggestions to improve online teaching, and trainers' online learning preferences. Both tools were reviewed by senior faculty members to solicit expert opinions on the appropriateness of the content. Cronbach's alpha values for the trainees' questionnaire were 0.74 for feasibility, 0.84 for concerns (perception domain), and 0.88 for the experience domain, which indicate acceptable reliability of our tool. These questionnaires were developed as Google forms, and links were shared with trainees and trainers individually.

The third and fourth instruments were in-depth interview guides used for collecting data from trainers and trainees, respectively, about their perceptions and experiences related to online teaching.[18] The probes in the interview guides differed for trainers and trainees. The respondents' biodata were noted before starting the interviews. The information gathered included; age, gender, current position (consultant/assistant trainer), training level, years of experience, and previous experience with online teaching/ learning. Interviewers took notes during the interviews. The interviews were also digitally recorded to safeguard against any loss of information while taking notes. In-depth interviews were conducted in Arabic to avoid potential language barriers and obtain maximum information.

Data analysis

Quantitative data from trainers and trainees were downloaded as Excel sheets and then imported for cleaning and analysis using SPSS version 21.0 (IBM Corp., Armonk, N.Y., USA). Open-ended questions in the trainers' questionnaires were codified before the analysis. Descriptive analysis was performed to calculate the frequencies and proportions of categorical variables and means with standard deviations for continuous variables. The chi-square test was used to examine differences in experience, perceptions, and preferences with respect to the level of training and gender. Fisher's exact test was used instead of the chi-square test where the expected count was less than five in more than 25% of the cells. Statistical significance was set at $p < 0.05$.

Transcripts of all in-depth interviews were prepared by listening to the audio recordings of the interviews and reviewing the notes taken during the interviews. Transcripts were then compared with recordings to assess completeness, and additions were made when missing information was found. Transcripts were shared with the respondents to confirm whether their messages were correctly transcribed. The researchers then read the transcripts independently multiple times to gain an understanding of the information. Thematic analysis was performed, and two researchers independently identified themes and held group discussions to reach consensus. The information in the transcripts was coded under relevant themes.

Results

Quantitative data

A total of 36 (62.1) of the 62 trainees responded to the online questionnaire. The mean age of the participants was 25.3 ± 3.29 years, and 50.0 were male. Approximately 52.8% attended online courses in the past. Approximately 47.2% of the participants used smartphones for online sessions. Among the trainers, 26 of the 40 trainers (response rate = 65.0%) participated in the study. Their mean age was 42.0 ± 9.96 years, and slightly more than half (53.8%) of the trainers were female. Nearly two-thirds (61.5%) of the trainers had more than five years of teaching experience (Table 1).

Two-thirds (66.7%) of the trainees agreed that online learning is effective; however, only 44.4% perceived online learning as a pleasurable activity. Only 50.0% wanted online teaching for other courses. Compared to face-to-face learning, approximately 38.9% perceived online learning as less effective, while 50.0% viewed it as equivalent. The most effective means of online engagement were simulations and group projects (75.0%), followed by posting on online message boards (63.9%). About 61.0% were somewhat to moderately concerned with learners' motivation and focus during online teaching. Approximately 63.9% of respondents were concerned with the quality of online learning. Poor/inconsistent contact with the instructor was a concern for 69.4% of respondents. Among the trainees, 80.6% perceived lack of direct contact with other students as a concern (Table 2).

Regarding current online learning experiences during the COVID-19 pandemic, about 88.9% found it easy to use online portals, and 86.1% agreed that information was clearly communicated. Only 25.0% rated interaction as good, while the rest rated it as either poor or neutral. Approximately 80.6% of the trainees were either very or extremely satisfied with online learning (Table 3).

Among the trainers, the majority were either dissatisfied or neutral about participation and interaction, speakers' and students' motivation, the quality of online learning, and the online teaching experience. However, approximately 46.1% of the trainers were satisfied with the ease of use of online teaching and learning. Online learning is considered to be less effective than face-to-face learning (Table 4).

Regarding online learning preferences, email (88.9%) and text messages (61.1%) were the most preferred channels among trainees for receiving class updates. Scores and specific feedback on individual items were the most preferred forms of feedback (55.6%). The most preferred modes of interacting with classmates were small-group discussions (77.8%) and small-group projects (75.0). The majority (88.5%) of the trainers preferred receiving class updates via email. About 65.4% preferred giving trainees feedback as scores and written feedback. For 88.5% of the trainers, a small group discussion board was the preferred interaction method (Table 5).

We did not find a significant difference in trainees' perceptions and experiences with respect to gender. However, a

Table 1: Demographic and professional characteristics of trainees (*n* = 36) and trainers (*n* = 26) at the Family Medicine Academy, Qassim, KSA.

Characteristics	Trainees	Trainers
Age		
Mean ± SD	25.3 ± 3.29	42.0 ± 9.96
Gender, *n* **(%)**		
Male	18 (50.0)	12 (46.2)
Female	18 (50.0)	14 (53.8)
Residency level, *n* **(%)**		
R1	7 (19.4)	−
R2	13 (36.1)	−
R3	10 (27.8)	−
R4	6 (16.7)	−
Current position, *n* **(%)**		
Consultant	−	5 (19.2)
Senior registrar	−	12 (46.2)
Registrar	−	9 (34.6)
Teaching experience, *n* **(%)**		
<5 years	−	16 (61.5)
>5 years	−	10 (38.5)
Previous experience of online course, *n* **(%)**		
Yes	19 (52.8)	11 (42.3)
Device mostly used to attend online sessions, % (*n*)		
Laptop	19 (52.8)	−
Smartphone	17 (47.2)	−
Proficiency with software and applications, *n* **(%)**		
Basic	2 (5.6)	7 (26.9)
Intermediate	26 (72.2)	18 (69.2)
Advanced	19.4 (7)	1 (3.8)
Expert	1 (2.8)	0 (0)

Table 2: Trainees' perceptions and concerns related to online learning (*n* = 36).

Variable	*n* (%)
Online methods were an effective way to learn about the assigned topics.	
Disagree	3 (8.3)
Neutral	9 (25.0)
Agree	24 (66.7)
Using online learning methods is fun.	
Disagree	9 (25.0)
Neutral	11 (30.6)
Agree	16 (44.4)
Online assignments similar to this should be used in other courses in the future.	
Disagree	8 (22.3)
Neutral	10 (27.8)
Agree	18 (50.0)
Compared to face-to face sessions, online sessions are	
Less effective	14 (38.9)
Equally effective	18 (50.0)
More effective	4 (11.1)
The most effective mean of online engagement is	
Posting to online message boards	23 (63.9)
Simulations	27 (75.0)
Blogging	10 (27.8)
Doing group projects	27 (75.0)
Being assigned a partner	18 (50.0)
Motivation	
Not at all concerned	8 (22.2)
Slightly concerned	6 (16.7)
Somewhat concerned	12 (33.3)
Moderately concerned	10 (27.8)
Extremely concerned	0 (0.0)

Table 2 (*continued*)

Variable	*n* (%)
Focus/Attention	
Not at all concerned	1 (2.8)
Slightly concerned	11 (30.6)
Somewhat concerned	11 (30.6)
Moderately concerned	13 (36.1)
Extremely concerned	0 (0)
Quality	
Not at all concerned	4 (11.1)
Slightly concerned	9 (25.0)
Somewhat concerned	9 (25.0)
Moderately concerned	14 (38.9)
Extremely concerned	0 (0)
Inconsistent/poor contact and communication with instructors	
Not at all concerned	3 (8.3)
Slightly concerned	8 (22.2)
Somewhat concerned	8 (22.2)
Moderately concerned	17 (47.2)
Extremely concerned	0 (0)
Inconsistent/poor instruction quality	
Not at all concerned	5 (13.9)
Slightly concerned	8 (22.2)
Somewhat concerned	8 (22.2)
Moderately concerned	15 (41.7)
Extremely concerned	0 (0)
Lack of direct contact with other students	
Not at all concerned	3 (8.3)
Slightly concerned	4 (11.1)
Somewhat concerned	9 (25.0)
Moderately concerned	20 (55.6)
Extremely concerned	0 (0)

Table 3: Trainees' current online learning experiences at the Family Medicine Academy, Qassim, KSA (*n* = 36).

Variable	*n* (%)
It is easy for me to use online recourses and access portals.	
Disagree	1 (2.8)
Neutral	3 (8.3)
Agree	32 (88.9)
Information is clearly communicated for online sessions and activities.	
Disagree	1 (2.3)
Neutral	4 (11.1)
Agree	31 (86.1)
During online sessions, the degree of interaction is	
Very poor	5 (13.9)
Poor	11 (30.6)
Neither poor nor good	11 (30.6)
Good	9 (25.0)
Very good	0 (0)
Online sessions and activities are interesting.	
Disagree	8 (22.2)
Neutral	11 (30.6)
Agree	17 (47.2)
Online sessions and activities are useful.	
Disagree	4 (11.1)
Neutral	7 (19.4)
Agree	25 (69.5)
Knowledge gained during online sessions/activities was	
Less than usual	9 (25.0)
Same as usual	24 (66.7)
More than usual	3 (8.3)
Overall satisfaction with online learning	
Not at all satisfied	0 (0)
Slightly satisfied	1 (2.8)
Moderately satisfied	6 (16.7)
Very satisfied	10 (27.8)
Extremely satisfied	49 (52.8)

significantly higher proportion of female trainees preferred to receive class updates through the learning management system ($p = 0.001$), while a higher proportion of male trainees preferred interacting via voice-generated messages ($p = 0.003$), real-time videoconferencing (live video chat) (Fisher's exact $p = 0.008$), and video-generated discussion (posting asynchronous video messages in responses on discussion board) (Fisher's exact $p = 0.003$). With respect to the level of training, overall satisfaction was higher among juniors (R1 and R2) than among seniors (R3 and R4) (Fisher's exact $p = 0.011$).

The weaknesses in the current online learning methods, as reported by trainees, were poor interaction, inadequate discussion, trainers' unpreparedness for online teaching, unclear slides, poor internet connection, poor trainee participation, absence of mechanisms to ensure whether trainees are actually attending the sessions, and covering two entirely different topics in one session. On the other hand, trainers reported a lack of interaction and difficulties with evaluation as the main concerns. Other weaknesses were the need for more time for preparation and technical issues with the Internet and equipment. However, trainers named flexibility, a good alternative in crises, and lower cost as advantages.

Trainees' suggestions to improve the online learning experience were as follows: Trainers should prepare well before the session and increase interaction with trainees, small group discussions should be incorporated, a suitable time should be chosen for sessions, all attendees should use a camera and microphone, only related topics should be covered in a single session, and the length of the online sessions should be reduced. Suggestions from the trainers included; offering training for online teaching instructors, using multiple methods such as case discussions, problem solving, videos, animations, and small groups, instituting a rule whereby trainees must always have their camera on, providing real-time feedback and increasing the duration of sessions.

Qualitative data

Four and three in-depth interviews were conducted with the trainees and trainers, respectively. The duration of the interviews ranged from to 25 to 45 min. Among the trainees, three were male and one was female, while among the trainers, two were female and one was male. Most of the themes were shared by both groups; themes included interaction, technical issues, trainees' interest, flexibility, trainers' role, alternate approach, and online teachers' training needs. Only trainees mentioned the accessibility of other learner opportunities, while trainers raised attendance and the future of online teaching.

Theme: Accessibility of other learning opportunities

Trainees reported opportunities to attend various online workshops and courses anywhere in the world. "*I was able to*

Table 4: Trainers' satisfaction with online learning at the Family Medicine Academy, Qassim, KSA (*n* = 26).

Variable	*n* (%)
How do you feel about interaction and participation during online sessions?	
Satisfied	4 (15.3)
Natural	8 (30.8)
Unsatisfied	14 (53.8)
What is your perception of speakers' and students' motivation?	
Satisfied	2 (7.7)
Natural	13 (50.0)
Unsatisfied	11 (42.3)
What is your perception of the learning quality?	
Satisfied	5 (19.2)
Natural	15 (57.7)
Unsatisfied	6 (23.0)
How do you feel about social interaction in online learning?	
Satisfied	1 (3.8)
Natural	7 (26.9)
Unsatisfied	18 (69.2)
How was your experience of conducting an online session? (*n* = 16)	
Satisfied	5 (31.2)
Natural	8 (50.0)
Unsatisfied	3 (18.8)
How do you feel about the ease of use of online teaching and learning?	
Satisfied	12 (46.1)
Natural	8 (30.8)
Unsatisfied	6 (23.1)

Table 5: Trainees' and trainers' online learning preferences.

Items	Trainees	Trainers
	n (%)	n (%)
Preference for receiving class updates (Yes)		
Email	32 (88.9)	23 (88.9)
Text	22 (61.1)	7 (26.9)
Audio message	3 (8.3)	7 (26.9)
Learning management system announcement	20 (55.6)	5 (19.2)
Preference for receiving/providing feedback		
Score and written overall feedback on assignments	25.0 (25.0)	17 (65.4)
Score and written specific feedback on individual items	20 (55.6)	12 (46.2)
Grade/score only	5 (13.9)	4 (15.4)
Score and audio/video feedback	2 (5.6)	5 (19.2)
Preference for interaction with classmates (Yes)		
Small-group discussion board	28 (77.8)	23 (88.5)
Large class discussion board	8 (22.2)	6 (23.1)
Small-group projects	27 (75.0)	14 (53.8)
Voice-generated discussion	10 (27.8)	7 (26.9)
Real-time video interaction	7 (19.4)	10 (38.5)
Video-generated discussion	8 (22.2)	6 (23.1)

attend a lot of teaching activities outside my region without having to travel and within the comfort of my home" [R1]. "I had a chance to attend an online course from Riyadh, which helped me with exam preparation" [R2].

Theme: Interaction

Poor interaction was the most common limitation according to both types of respondents. "It is only the presenter and 4 to 5 residents [who are] actively participating with him/her, and we (residents) are around 60 [people], and most of them not paying attention" [R1]. Trainers raised similar concerns related to interaction. One trainer said, "Lack of interactions and difficulty with evaluation are the main disadvantages of online learning" [female trainers].

Theme: Technical issues

Both trainees and trainers reported technical issues, such as internet connectivity. "Some of our colleagues had some technical issues regarding Internet connection, but it was rare" [R2]. Similarly, a female trainer mentioned that "There are technical problems with IT equipment such as software and poor Internet at the time of session, which affects motivation".

Theme: Trainees' interest

Trainees' interest in learning plays an important role in their engagement and overall learning outcomes. One of the female trainers said, "I fell as I am talking to myself". Lack of interest was related to the topics of online activities. "WADA (weekly academic day activity) topics should be chosen by the residents, not the administration. Residents are mature enough to know about their deficiencies and [so] put these deficiencies as learning objectives. Alternatively, the administration can therefore choose the theme (main topic) for the day and the trainees [can] define the objectives" [R3].

Theme: Flexibility

Flexibility is another commonly cited advantage of online learning. The temporal and spatial flexibility virtual learning offers makes attendance easier. "Other colleagues preferred the online method because first, it is comfortable, especially for people who come from [a] far distance. We are more flexible with regard to time online" [R1]. Trainers, on the other hand, also cited flexibility and ease of performing online activities as main advantages: "easy accessibility, good alternative, including many residents, low cost, quieter and more self-confidence" [female trainer].

Theme: Trainers' role

Both groups equally emphasised trainers' role in effective online learning. "Some trainers actively try to elevate the session by themselves or through the presenter (trainees), while others do not" [R3]. "Some residents do not have (good) presentation skills, so they just read their slides. In this situation, I expect my supervisor to intervene and generate a discussion. Only a few trainers tried that, with some of them failing." [R2]. "Trainers can improve the interaction and participation by using interesting teaching tools such as case discussion, problem-solving, videos, and animations" [male trainer].

Theme: An alternative during the COVID-19 pandemic

During the COVID-19 pandemic, online learning is regarded as the best alternative to continue learning without exposure to the risk of infection. "We are glad that we avoided physical contact by using online learning" [R1]. "Even if we used infection control measures during the early stage of the pandemic, and resourses were available to conduct the sessions online. (So) it was a safe option" [R4]. "It is difficult to make an online presentation, but it is useful, especially in an unusual situation like COVID-19" [Female trainer].

Theme: The need for online teacher training

Trainees stressed the need for training for trainees and trainers to acquire the appropriate skillset for online teaching. "Getting a lecture from someone who specialises in online teaching is very important, especially in audience engagement" [R3]. Trainers also suggested instructor skill development for effective online teaching. "Increasing the trainers' knowledge and skills for online education by conducting a series of training courses can help raise the standards of teaching" [female trainer].

Theme: Concerns about trainees' actual attendance

Trainers raised concerns about learners' actual presence during online sessions. They expressed the opinion that trainees join the online sessions and keep their device in silent mode. "*To ensure their [trainees] presence, [the] academy should make it mandatory to keep cameras on during the session*" [male trainer].

Theme: Future of online learning

There were mixed responses regarding future use of online learning. One trainer said, "*My overall experience with online learning was good, but I like traditional teaching*". Another said, "*If we strengthen online learning, it will be more valuable than [it is] now*".

Discussion

This is the first study of its kind in the region to assess the perspectives and experiences of trainees and trainers regarding online learning and teaching in a postgraduate medical program amid the COVID-19 pandemic.

We found that about two-thirds of the trainees perceived online methods as an effective way of learning, while only half thought that it was as effective as face-to-face sessions. These findings are similar to those from a study in Malaysia where a little less than half of medical physics students perceived online learning as superior.[7] Another study involving medical students from Pakistan, however, reported that an even lower proportion (16.0%) of students perceived online learning to be as effective as face-to-face sessions.[8] This lower perceived effectiveness of online methods could be due to a number of associated limitations such as lack of focus/attention, teaching quality, Internet issues, and virtual communication, which have been reported in our study as well as in several other studies globally.[7,10,12] Our qualitative results support these conclusions, as both trainees and trainers identified poor interaction and lack of interest as common issues in online learning. These factors require attention when planning and implementing online learning methods.

Regarding trainees' online learning experiences during the COVID-19 pandemic, only 25.?% rated interaction during sessions as good, while 47% agreed that online sessions are useful. These findings are similar to findings from Pakistan and Malaysia, where nearly half of the students considered online sessions to be useful.[7,9] About 80.5% of the trainees in our study were satisfied with online learning. This is higher than the 69.5% reported by a study involving undergraduate medical students in Pakistan.[11]

Among the trainers, only 15.3% and 19.2% were satisfied with interaction and quality of learning, respectively. Nearly one-third of the trainers who conducted online sessions were satisfied with them. This trainer satisfaction level is lower than that among trainees, possibly because trainers may have had higher unmet expectations of online teaching. During the in-depth interviews, trainers raised concerns about trainees interest in online sessions, which may have been a source of disappointment.

Both trainers and trainees preferred email as the medium for receiving class updates, while text messages and announcements on the learning management system were the other preferred means for trainees but not for trainers. Official emails are the standard means of communication with trainees and trainers. However, with the advent of new applications, other means are also preferred, especially among new generations.[19] A study in the United States reported significantly higher use of social media among students compared to faculty.[20]

Assessments and monitoring of academic progress pose issues in online methods of learning.[11,21] In our study, trainers preferred scoring and overall feedback, whereas trainees preferred scores with specific feedback on individual items. This may indicate that trainees' positive attitude about assessments, as an important component of training. Evidence suggests that trainees' and trainers' perceptions about evaluations, affect the effectiveness of the evaluation process.[22] Implementing appropriate evaluation methods to cope with the challenges of distant learning during crises such as the COVID-19 pandemic is therefore recommended.[23] Interaction and social contact have been widely reported as limitations of online methods in recent studies.[10–12] Planners need to identify strategies for improving interaction and social contact. We found that small-group discussion boards and small-group projects were the preferred means of interaction among classmates. Small groups provide an interactive and dynamic way of learning[24] and are therefore rated highly among students and trainees.[25]

Among the weaknesses discussed earlier; trainees also pointed out unprepared faculty as an additional weakness. Similar findings were obtained from the qualitative data, where trainees and trainers emphasised skills and training for online teaching. With the widespread use of online learning methods, it is recommended that teachers learn about technology and develop online teaching skills.[26] This calls for formal training of online instructors as an essential part of faculty development. Suggestions from both groups to improve the quality and outcome of online learning methods were as follows: remote teaching/learning training for students and faculty, small-group sessions, and a camera-on policy. Trainees, on the one hand, suggested reducing the duration of online sessions, whereas trainers suggested increasing sessions' duration. In this regard, various quality improvement strategies can be used. Researchers from China reported the use of the plan–do–check–act (PDCA) cycle to implement, manage, and improve the quality of postgraduate medical education during the pandemic.[27]

This study is unique in that it assesses the perspectives and experiences of trainees and trainers in a postgraduate medical program. We used a mixed-method strategy to increase the validity of the findings. Certain limitations should be considered while interpreting the results and discussion. First, this study was conducted at a single regional family medicine training centre, which may limit its representativeness. However, we assume this to have had a limited impact on the generalisability of our results because all family medicine training centres in the KSA are accredited by the Saudi Commission for Health Specialties, which ensures standardised infrastructure and processes. Second, although a sequential design is preferred, we used a parallel mixed-method design due to limited time and resources. Nonetheless, the qualitative data in our study helped confirm the findings derived from the quantitative surveys and yielded an in-depth understanding of the respondents' perspectives.

Conclusion

We found that overall satisfaction with online learning was low for both trainers and trainees. There were concerns regarding effectiveness, interaction, participation, motivation, and quality of learning. To make online methods more effective, there is a need to train trainers to use online teaching methods and involve trainees in planning online activities to help increase their motivation and participation in online learning.

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Conflict of interest

The authors have no conflicts of interest to declare.

Ethical approval

This study was reviewed and approved by the Qassim Regional Bioethics Committee (approval number: 1441-1717686, dated 21-09-1441 H). Written informed consent was obtained from all the participants.

Authors contributions

UR and AAS conceptualised the study and developed the study tools. UR and AAS analysed the quantitative data for trainees and trainers, respectively. AAS and AMA conducted and transcribed the in-depth interviews with the trainees and trainers, respectively. UR, AAS, and AMA analysed the qualitative data. UR wrote the final manuscript, with contributions from AAS and AMA. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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