Challenges and Barriers of E-Learning in Medical Education during the COVID-19 Pandemic from the Viewpoint of Teaching Staff

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ABSTRACT

Introduction: E-learning in medical education during the COVID-19 pandemic presents challenges for teaching staff, including technical skills, limited access to technology, and difficulty in practical sessions and clinical rotations.

Objectives: This study aims to explore the challenges and barriers of e-Learning in medical education during the COVID-19 pandemic experienced by teaching staff.

Methods: A cross-sectional study was conducted with the teaching staff at Al-Ghad International Colleges for Applied Medical Sciences, Saudi Arabia, during the COVID-19 pandemic. An online questionnaire to collect data; 104 participants responded to the questionnaire. The data were analyzed using (SPSS version 24).

Results: The findings of this study showed that the challenges faced by the teaching staff included organizational factors, such as a lack of internet services (51% agree versus 38.5% disagree), a lack of data confidentiality (76% agree versus 24.1% disagree), and a lack of education platform technical skills (6.7% agree versus 90.4% disagree). The second reported challenge was related to the student evaluation mechanisms, such as a lack of monitoring the progress of skills (86.5% agree and 4.8% disagree) and a lack of performing practical skills (93.3% versus 0 disagree). The third challenge was related to the educational platform, with 86.5% agreeing that there is a lack of monitoring of the progress of the skills domain, 70.2% agreeing there is ineffective communication, and 86.4% agreeing that there is weak active interaction.

Conclusions: Our study found three main challenges of e-learning experienced by the teaching staff during the spread of the pandemic: organizational factors, student evaluation mechanisms, and educational platforms. These challenges have been experienced during the transition to e-learning.

Keywords: E-learning, COVID-19, Challenges, Barriers, Saudi Arabia

INTRODUCTION

Modern technologies play a prominent role in the educational process, and most educational institutions have turned to them. E-learning requires teachers to be fully aware of the technologies of educational platforms in order to achieve the desired goal[1].

E-learning was in use before COVID-19 became widespread, but it was not the primary tool in the education system. Online education is the most appropriate alternative to in-person classes for the continuation of the educational process, so most of the world's nations have come to use it. Institutions have coped with the rise of technology in the educational process; educational institutions have used many types of educational platforms to avoid technical problems and distribute their electronic burden on these platforms; information technology departments have had a major role in running the work system[2, 3].

The current information and communication technologies' rapid development has helped to promote their educational uses, which has led to an increase in the efficiency of forms of distance education, the emergence of new, more effective technologies, and the consolidation of the "multi-channel" education approach. We found that in the recent period, information technology sparked many new educational

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methods, as it did not present technical difficulties on intake, was low in cost, and, for students, worked on many electronic devices[4].

E-learning is sending and receiving information through various educational platforms, and it has become easy and simple for all teachers and students, as the development of communication technology, as modern devices and smart phones are available to everyone[5]. The e-learning process is widely used, and it takes place anywhere and at any time, unlike the traditional study process in classrooms and direct communication. The e-learning process takes place by creating virtual classes via computers and networks with many different technologies and platforms that support the education process. In which interaction and communication skills are used, and information is presented to the recipients, e-learning is an aid, and companion to the traditional educational process, it also gives the student the ability to view images of complex medical concepts and complex vital processes[6, 7]. There are two studies by Alqudah et al, and Ebner, its results showed that e-learning is the most successful alternative in educational transformation, due to the spread of the COVID-19 pandemic, and the imposition of health restrictions such as spacing and avoiding overcrowding[8, 9]. It may clarify the challenges and barriers facing faculty members in order to identify and address them in the future and to conduct substantial research in this direction. Therefore, this study aims to explore the challenges and Barriers of e-Learning in medical education during the COVID-19 pandemic experienced by teaching staff.

METHODS

Study Design: A cross-sectional study was conducted among the teaching staff of Al-Ghad International Colleges for Applied Medical Sciences, Saudi Arabia. Al-Ghad Colleges is a group of private colleges in eight major cities across Saudi Arabia. The study was conducted from September to November 2020, during the pandemic. A simple random sampling method was used. Teaching staff from each branch were selected; they received an electronic questionnaire via email. 104 of the participants completed the questionnaire.

Data Collection: The data was collected via an online questionnaire that was distributed to all teaching staff at selected colleges via email, along with an explanation of the purpose and process of the study. They were assured of the confidentiality of collected data, including their personal information. The responses were collected on Excel sheets and then converted to SPSS for analysis. The electronic questionnaire consisted of two main sections. Section one: Captured the demographic characteristics of the respondents (gender, age, marital status, qualifications, training in e-learning platforms, and experience). Section two: Consisted of questions adopted from previous studies to identify the challenges and barriers faced by faculty members regarding medical e-learning[10,11]. The questions were categorized on five-level scales according to the Likert scale (strongly disagree, disagree, neutral, agree, or strongly agree).

Pilot Study: A pilot study was conducted on eight members of the teaching staff of one college branch to determine the suitability of the questionnaire, locate any portions that were hard to understand, and control for the time required to complete the questions. Those who participated in the pilot study were then excluded from the main study sample. The findings of the pilot test showed the tool was valid and reliable, with a Cronbach Alpha of 0.79. The questionnaire was then shared with the study participants.

Statistical Analysis: The data was analysis using SPSS version 24. The data was coded into variables, frequencies, and percentages. The differences were calculated using the standard deviation (SD) and the mean (M) of the variables. A *p*-value of < 0.05 was considered statistically significant.

Ethical Considerations: An ethical approval letter has been obtained from the ethics committee of the Al-Ghad International Colleges for Applied Medical Sciences for conducting the study (ethical approval code: NO/ALGHAD/10/2020). An agreement was obtained from all participants before enrolment in the study, which was taken when sending them the online questionnaire by explaining the aims of the study and the confidentiality of their data, with their right to respond or not to the invitation and their responses were considered as an agreement for participation, Informed consent was obtained from all participants.

RESULTS

Demographic Data of the Participants: The results of the study show that the total number of participants in this study was 104. The majority of the participants were males (72%), had ages ranging from 42-50 years (73%), were married (64.4%), had more than ten years of experience in the education field (62.5%), and held doctorate-level degrees (68.3%). The results also showed that 63.5% of participants had previously received training on the use of e-learning platforms, as represented in table 1.

Challenges and Barriers from the Viewpoint of the Teaching Staff Regarding e-learning: The challenges of and barriers to e-learning from the viewpoint of the teaching staff. The challenges and barriers were reported by responses (strongly agree to strongly disagree); they include organizational factors such as lack of internet services (51% agree versus 38.5% disagree), lack of data confidentiality (76% agree versus 24.1% disagree), and lack of education platform technical skills (6.7% agree versus 90.4% disagree). The second factor was the student evaluation mechanism, such as lack of monitoring the progress of skills (86.5% agree and 4.8% disagree), lack of performing practical skills (93.3% versus 0 disagree). The third factor was the educational platform, with 86.5% agreeing that there is a lack of monitoring the progress of the skills domain, 70.2% agreeing there is ineffective communication, and 86.4% agreeing that there is weak active interaction. Regarding personal challenges, the results show that most of the faculty members, i.e., 77.9%, do not agree that there is insufficient knowledge, and 80.7% do not agree that there is a lack of tools used in the education platform, as represented in table 2.

The Correlation Between Demographic Characteristics, and the Challenges of E-Learning in Medical Education: Table 3. shows the correlation between the demographic characteristics (gender, age, qualification, and training courses) with the challenges of e-learning during the COVID-19 pandemic; there was a statistically significant (p-value less than 0.05).

Challenges of E-learning Related to Personal Factors: The results of the study showed that 7% of teaching staff, they have lack technical skills regarding the platform, 12% had no previous experience in e-learning, and 15% lack of electronic tools, as represented in figure 1.

Table 1: Demographic data of the participants (n = 104)

| Variable		Frequency (%)
Gender	Male	75 (72%)
	Female	29 (28%)
Age	25–30	5 (4.8%)
	31–36	11 (10.6%)
	37–41	6 (5.8%)
	42–50	76 (73%)
	51 and above	6 (5.8%)
Marital status	Married	67 (64.4%)
	Single	24 (23.1%)
	Divorced	4 (3.8%)
	Widowed	9 (8.6%)
Qualification	Bachelor	11 (10.6%)
	Master's degree	22 (21.2%)
	Ph.D.	71 (68.3%)
Training courses about e-learning platforms	Yes	78 (75%)
	No	26 (25%)
Experience	1-5 years	14 (13.5%)
	6-10 years	25 (24%)
	More than 10 years	65 (62.5%)

Table 2: Challenges and barriers from the viewpoint of the teaching staff regarding e-learning

Challenges and barriers related to:	Strongly agree	Agree	Neither	Disagree	Strongly disagree
1. Organizational factors					
Lack of internet service	53 (51%)	0	11 (10.6%)	32 (30.8%)	8 (7.7%)
Lack of data confidentiality compared to traditional education		78 (76%)	2 (1.9%)	21 (20.2%)	3 (2.9%)
Lack of education platform technical support	4 (3.8%)	3 (2.9%)	3 (2.9%)	13 (12.5%)	81 (77.9%)
2. Student evaluation mechanism					
Lack of monitoring progress of the skills domain	75 (72.1%)	15 (14.4%)	9 (8.7%)	5 (4.8%)	0
Lack of performing practical skills	64 (61.6)	33 (31.7%)	7 (6.7%)	0	0
3. Educational platform					
Lack of effectiveness in communicating	37 (35.6%)	36 (34.6%)	4 (3.8%)	17 (16.3%)	10 (9.6%)
Lack of access to the education platform	0	3 (2.9%)	4 (3.8%)	25 (24%)	72 (69.2%)
Lack of continuous follow-up and guidance with students	25 (24%)	16 (15.4%)	3 (2.9%)	23 (22.1%)	37 (35.6%)
Lack of interaction in education platforms	73 (70.1%)	17 (16.3%)	4 (3.8%)	2 (1.9%)	8 (7.7%)
User identification problem	23 (22.1%)	33 (31.7%)	5 (4.8%)	34 (32.7%)	8 (7.7%)
4. Personal challenges and barriers					
Lack of knowledge of the setting for a learning platform	7 (6.7%)	0	16 (15.4%)	3 (2.9%)	78 (75%)

Table 3: The correlation between demographic characteristics (gender, age) and the challenges of e-Learning in medical education (n = 104)

Variables		Frequency (%)	Mean ± SD	p-value
Gender	Male	75 (72%)	4.16 ± 2.03	
	Female	29 (28%)	4.09 ± 2.21	0.73
Age	25–30	5 (4.8%)	4.11 ± 2.12	
	3–36	11 (10.6%)	4.09 ± 2.01	
	37–41	6 (5.8%)	4.17 ± 2.04	
	42–50	76 (73%)	4.08 ± 2.14	0.58
	51 and above	6 (5.8%)	4.21 ± 2.05	
Qualification	Bachelor	12 (11.5%)	3.19 ± 1.19	
	Master's degree	21 (20.2%)	3.97 ± 1.73	
	Ph.D.	71 (68.3%)	3.23 ± 1.12	0.02*
Training courses, in e-learning platforms	Yes	78 (75%)	3.17 ± 1.16	
	No	26 (25%)	3.96 ± 1.72	0.001*
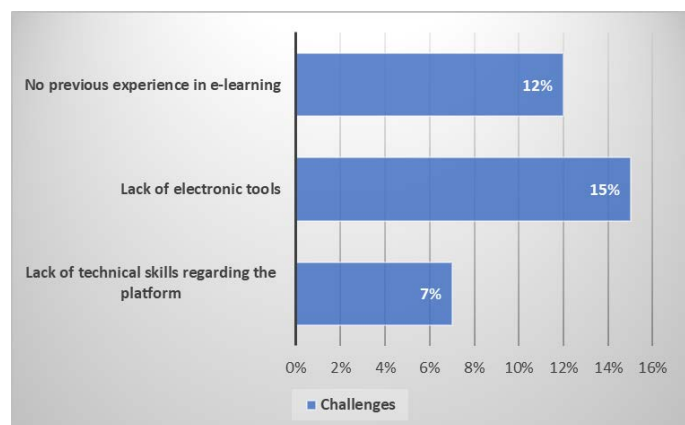
(*) significant

Figure 1: Challenges of E-learning Related to Personal Factors

DISCUSSION

The literature supports that the knowledge of teaching staff about the platform has a significant impact on the e-learning in higher education[1,12,13], resulting from the emergence of the COVID-19 pandemic and the shift in higher education to online learning, which faced several challenges in terms of the teaching staff's ability to utilize the new technology[14,15]. The results of this study revealed that three-quarters of the teaching staff undertook courses in online teaching, a number similar to previous studies in nursing education[16,17].

The findings of this study showed that the teaching staff, faced several challenges to and barriers in e-learning during the spread of COVID-19. These challenges and barriers include organizational factors, such as lack of internet services, lack of data confidentiality, and lack of education platform technical skills. A qualitative study by Simamora, (2020), found that technical skills and risk of user data (distorted or corrupted) are the main challenges of online learning[18], study by (Mukuna, and Aloka 2020), in South Africa, showed that the challenges of e-learning indicated that the lack of electronic devices and communication networks represented major challenges in the idealization of e-learning during the spread of COVID-19[19]. Furthermore, faculty members in nursing education experienced difficulties in the application of online learning during the spread of the COVID-19 pandemic: a 2021 study by Bdair found that the challenges included inadequacy, academic integrity, and learning environment[20], a study carried out at other universities highlighted that technical issues and internet connectivity were the main challenges of online learning, with findings similar to those in a Polish study[21], indicating that about half of teaching staff had some obstacles with internet service. These could be the results of the sudden shift from traditional learning to e-learning and faculty members' lack of preparation for the changes.

The second challenge of e-learning faced by teaching staff in this study concerned mechanisms for evaluating students, such as the lack of monitoring, the progress of skills, and lack of performing practical skills. Similar findings were reported in a study among medical students at Qassim University that showed that students' performance in problem-based approaches was enhanced as a result of their teachers' ability to assess them[23]. A systematic review on nursing students found that during the pandemic, the students had high levels of stress related to their performance and to subject exams[23], a previous study on remote e-exams during the COVID-19 showed that online exams are major challenges in online leaning[24]. This result is supported by and compatible with an integrative review[25], and the results indicate poor practical skills in the application of e-learning. A study conducted in Ireland also supports our results; it showed that the acquisition of clinical skills is not effective through applying simulation skills[26].

The third challenge of e-learning among university educators in the current study was educational platform–related factors, such as a lack of monitoring the progress of the skills domain, ineffective communication, and weak active interaction. The results of the study showed a lack of data confidentiality and privacy compared to traditional education. This result is in agreement with a study conducted in Romania that found that the technical obstacles to data are the most important[27]. This was also similar to a study conducted in Jordan, where communication was low during e-learning compared to direct education[28].

Furthermore, another study, conducted at the University of Madaba, reported a lack of effective communication during online learning[29]. Our study showed a lack of interaction on educational platforms by faculty; similar results were reported in a study carried out in Jordan that found that most of the teaching staff faced low interaction with their students within educational platforms compared to traditional classrooms[30].

There are some limitations in this study, it was carried out in the Kingdom of Saudi Arabia at a single educational facility, and thus lacks generalizability. Moreover, due to the pandemic lockdown, opportunities were not available for training to overcome the challenges.

CONCLUSION

In conclusion, this study aims to explore the challenges and barriers related to medical e-learning during the COVID-19 pandemic from the viewpoint of teaching staff. Our study indicated that there are three main categories of challenges and barriers facing the teaching staff in the e-learning process during COVID-19 pandemic—organizational factors, student evaluation mechanisms, and educational platforms, all of which have been experienced during the shift to online learning. This requires further in-depth studies to identify challenges and difficulties and improve e-learning.

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