ORIGINAL ARTICLE

COVID-19 Pandemic and E-Learning System: Perception of Teaching Faculty at Medical Colleges in Pakistan

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ABSTRACT

Aim: To determine the impact of the e-learning system on teaching faculty of medical colleges during COVID-19.
Methods: A cross-sectional study was designed,and data was recruited from 50 medical faculty teachers using the e-learning program in the COVID-19 pandemic. A self-administered questionnaire containing different aspects of faculty's perception regarding the impact of COVID-19 on the e-learning system, facilitation conditions, training requirements, and usage of technology was asked. The obtained data were coded and analyzed using SPSS version 24 (IBM). Descriptive and inferential statistical analysis was applied to calculate percentages, mean with standard deviation, and correlation among variables.
Results: Results of this study indicate that majority of medical college teachers (76%) are not satisfied with the e-learning system. However, they agreed that it is the best alternative strategy in the current time. There was no gender difference observed in the response of medical faculty members though age <40 years were more satisfied with the e-learning arrangements. The capabilities of using mobile apps and computers were found to be correlated with the impact of the e-learning system.
Conclusion: Overall, teachers of the medical colleges are not satisfied with the e-learning system, and to enhance the effectiveness of e-teaching, there is a dire need to enhance the skills of faculty members to use advanced computer technologies.
Keywords: Distance learning, E-learning, COVID-19, Medical teaching

INTRODUCTION

In 2019 a novel coronavirus (SARS-CoV-2) had expanded from Wuhan city of China to across the globe[1].The influence of an epidemic depends on the number of cases, transmissibility, and the spectrum of clinical severity[2]. The transmission of this virus is via human to human or by respiratory droplets, with an estimated incubation period of 2-14 days. COVID-19 patients can be asymptomatic or present with mild disease or severe to cause acute respiratory distress syndrome (ARDS)[3,4].

Almost all the countries have adopted the same strategy for curbing the dissemination of this highly infectious disease by enforcing lockdowns, social distances, limiting face to face education, and travel restrictions[5]. The closure of academic institutes in the COVID-19 pandemic results in an unprecedented effect on the education system. The advanced technologies and learning education system (LMS) for teaching and evaluation of students has provided an alternative approach to teachers and policymakers to use information technology for convenient work during the lockdown of the pandemic[6].

All the stakeholders and institutional administrators are making substantial efforts for the optimum use of available technology to proceed with the educational process and to lessen the gaps in the recent situation.

Teachers conducted e-learning with several e-teaching software, such as webinars and zoom explored to deliverthe highest possible comfort to the students. In Pakistan, the educational institutes have been closed by the government amid the COVID-19 outbreak. However, the Higher Education Commission (HEC) has directed all universities to have well-built learning management systems (LMS) to initiate online classes so that teaching may not be compromised[7]**.** Several studies have highlighted the significance and effectiveness of the e-learning system[8,9]. Despite several benefits of e-learning, there are limitations of social isolation and lack of interaction between teachers and students[10].

Considering this a new method of teaching in Pakistan, both students and teachers are facing difficulties in e-learning. To our knowledge, there is not any study done to see the satisfaction of medical college faculty towards the e-learning system and the problems they faced. The purpose of this research article is to know the impact of the e-education system during COVID-19.

METHODS

Study Design: A questionnaire-based study was designed to obtain responses of medical teachers, those who were affianced in the e-learning program during COVID-19. The survey instrument comprised of 15 closed-ended questions and took approximately 10 minutes to complete.
Sample: In this study, only the medical teaching faculty irrespective of their gender and age were included. All the

faculty members found with any known comorbidity such as hearing loss, medical conditions, and structural abnormalities were excluded from this survey.

Assessment Protocol: A self-administered questionnaire was containing different aspects to see theoverall perception of e-learning, availability of facilities, the requirement of training, and usage of technology. An online survey tool was distributed via WhatsApp, Email, Google's form, and participants were given 15 minutes to read, comprehend, and respond to all the questions. Knowledge was assessed by questions focusing on medical faculty's difficulties in e-learning during COVID-19.

Statistical Analysis: The SPSS version 24.0 was used to analyze the data. Descriptive analysis for each subscale was done to calculate percentage, mean, and standard deviation. All the negative worded questions were reversely scored to calculate the mean for the four main categories. For inferential statistics,Pearson correlation and independent t-test were applied.

RESULTS

In this survey response of 50 faculty members of medical colleges were taken to investigate the difficulties faced by medical faculty in e-learning during COVID-19. Overall a high proportion of male faculty members 31 (62%) and those aged less than 40 years 27 (38%) participated in this survey.

We categorize 15 questions into four main categories. The response of participants for each subscale item presented in Table I. Overall perception of faculty members towards the effectiveness of e-learning indicates, 76% of faculty members disagree for the equal benefits of e-learning and assumed COVID-19 has a considerable impact on students education. Though the same proportion of faculty members believed e-learning is the only possible solution to avoid academic loss. Regarding the availability of facilities, the majority of faculty members agreed the institute has all facilities required for distance learning education. For the requirement of training, 82% of faculty members stressed about it for the efficient use of technology, and institutes are giving required training to their faculty members. For the usage of technology, 14% of faculty members said they are not comfortable with the usage of different apps on computers, and 16% are not comfortable with mobile apps.

Pearson correlation analysis revealed that the usage capabilities of faculty members have a statistically positive correlation with the overall perception of faculty members towards e-learning (r=0.32, p=0.02), availability of facilities (r=0.6, p<0.001) and training requirements (r=0.30, p=0.04). The results are presented in Table II.

Table-I: Descriptive statistics about the faculty response towards e-learning system

Variable	Agree	Disagree	Somewhat agree	Mean±s.d.
Overall perception of e-learning				
Are teachers disappointed with online teaching system amid COVID-19	42%	36%	22%	1.8±0.80
Online teaching provides the same benefits as face to face lectures.	16%	76%	8%	1.92±0.50
COVID-19 pandemic is having a huge impact on student learning	76%	10%	14%	1.38±0.72
Online learning in time of COVID-19: A better option to avoid academic loss.	76%	14%	10%	1.34±0.65
E-learning appears to improve the learning outcomes.	20%	28%	52%	2.32±0.80
Availability of Facilities				
E-learning resources are available in the institution	62%	10%	28%	1.66±0.90
Support mechanisms are not available to the development and delivery of e-learning content.	20%	26%	54%	2.34±0.80
Getting access to an internet-connected computer is a problem for us	36%	16%	48%	2.12±0.90
I am connected to the Internet with a fairly fast, reliable connection such as DSL or cable modem.	38%	26%	36%	1.98±0.86
Requirement of Training				
Our institutions are enabling teachers to become an effective user of e-learning technology	62%	4%	34%	1.72±0.90
Training is essential to become an efficient use of technology	82%	0%	18%	1.36±0.77
Computer / Mobile Usage Capabilities				
I am comfortable to use computer apps (Google Classroom/PowerPoint/Word etc.)	54%	14%	32%	1.78±0.91
I am comfortable to use mobile apps (Google Classroom/PowerPoint/Word etc.)	46%	16%	38%	1.92±0.92
I have headphones or speakers and a microphone to use if a class has video lectures	46%	24%	30%	1.84±0.86
My browser will play several common multimedia (video and audio) formats	46%	14%	40%	1.94±0.93

Table-II: Correlation analysis of studied variables

Variables	Statistics	Overall perception of e-learning	Availability of Facilities	Requirement of Training	Computer / Mobile Usage Capabilities
Overall perception of e-learning	PC	1			
	p-value	-			
Availability of Facilities	PC	0.20	1		
	p-value	0.18	-		
Requirement of Training	PC	0.05	0.16	1	
	p-value	0.70	0.26	-	
Computer / Mobile Usage Capabilities	PC	0.32	0.60	0.30	1
	p-value	0.02[*]	<0.001[*]	0.04[*]	-

PC: Pearson correlation; [*]significant p-value

Table III: Influence of age and gender on the e-learning system

Variable		Overall perception of e-learning	Availability of Facilities	Requirement of Trainings	Computer / Mobile Usage Capabilities
Gender	Male	1.80±0.40	2.04±0.41	1.50±0.61	2.04±0.41
	Female	1.76±0.34	2.11±0.51	1.60±0.67	1.82±0.51
p-value		0.44	0.48	0.18	0.16
Age	<40 years	1.80±0.30	2.02±0.42	1.44±0.62	1.90±0.52
	≥ 40 years	1.78±0.45	2.12±0.52	1.65±0.64	2.04±0.38
p-value		0.03	0.31	0.64	0.06

An independent t-test was done to see the difference in response between gender and age group. Results indicate that there is no significant difference between male and female faculty members. However, teachers aged < 40 years have a significant association with the effectiveness of e-learning. However, no significant difference in the availability of facilities, the requirement of training, and usage of technology was observed.

DISCUSSION

The current study sought to evaluate the impact of e-learning on medical faculty members during COVID-19. The outbreak of COVID-19 has caused the sudden suspension of all educational institutes. In this hard time, teachers used e-learning tools to inculcate education to students. In the current study, different questions have been asked by the faculty members of the medical college to access the perception of teachers about the e-learning system. The significance of evaluating e-learning platforms was discussed in many studies[11]. The findings of these surveys will help in shaping the strategies to improve the e-learning system.

The need for the e-learning system in medical education has already been well established in several studies. The challenge of limited faculty and institutional resources in developing countries with a need to raise the number of health care providers has attracted the e-learning system[12,13].

Results of the descriptive analysis indicate that the majority of teachers believe that the e-learning system is not equivalent to in-person teaching, and this system cannot improve learning outcomes. Regarding the institutional facilities, faculty members are satisfied, and they emphasized that related training is required for the effective use of the e-system. A recent study by Ferrara et al., highlighted the impact of e-learning on the ophthalmology training during COVID-19. They declared COVID-19 related restrictions have a devastating impact on the graduate medical students[14].

Our results indicate that faculty members who have capabilities of efficiently using mobile phones and computers have a positive correlation with the effectiveness of the e-learning system, they are satisfied with the available facilities and emphasize the significance of training to become effective users. These findings concur with the earlier reports stated that students and teachers who more frequently use social networking media have significant potential to cope with e-learning system[15]. Another study conducted by Chang and co-workers in China suggests that teachers are not ready to embrace the online education system. During the survey, they found that some of the faculty members are with low scale knowledge of computer technology, and they preferred the face-face interaction with students[16].

This study highlighted that there is no gender difference in faculty response. This survey does not validate the dominance of male teachers over female teachers. Our findings contradict the idea that technology is a male domain[17,18]. Age is assumed to be one of the parameters that tend to mould the perception of faculty members towards e-learning. Our results are in agreement with the previous studies, indicating the age of faculty members is associated with their overall perception of e-learning during COVID-19. Similar findings are reported in different studies a study in Saudi Arabia showed teachers'≥45 years are less willing to learn new tools of advanced technology, and they do not prefer e-teaching[19].

A recent study in Pakistan was done to see the perception of medical students towards the effectiveness of the e-learning system. They concluded that overall medical and dental students have negative perceptions, and they preferred in-person education. Despite gaining extensive popularity, digital technology has not been accepted by medical students. They suggested accessing the faculty experience regarding e-teaching during COVID-19[20].

The findings of this study are imperative and require the attention of the authorities to ensure an effective e-learning system in medical colleges in Pakistan. There are some limitations of this survey study. The number of respondents in this study is relatively small, which may not represent the entire medical faculty. This study was a cross-sectional survey; however, a longitudinal survey is required to identify real-time issues of the e-learning system in a better way.

CONCLUSION

The e-learning system is an essential modality to the continuation of medical education during this pandemic. Most of the teachers believe e-learning is an excellent supplementation to avoid academic loss, but it cannot replicate a similar output as in-person education. The high competences of using devices like mobile and computers have a substantial impact on the positive perception of the e-learning system.

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