

E-Learning among Medical students of Pakistan: Challenges and Opportunities

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Abstract

Objective: The study was done to assess the impact of E-learning methodologies on medical students of Pakistan.

Method: A cross-sectional study was conducted from 16th September 2021 to 16th October 2021. Research questionnaire was constructed on google-forms, and it was electronically distributed amongst the students studying in various medical colleges of Pakistan. 188 students were included in this study. The questionnaire was designed to scale the students' IT skills, their experience of previous participation in any online courses, comparison of face-to-face learning and e-learning in terms of acquiring knowledge, clinical skills, social competences and possible advantages of e-learning. Descriptive statistics were used to analyze different parameters including advantage and disadvantage of e-Learning and its acceptability by the students. The Chi-square and Mann-Whitney test were used to compare answers. P value < 0.05 was considered statistically significant.

Results: Seventy-two male and 116 female students responded to the questionnaire. Most of the participants found it less effective than in person learning in terms of increasing skills (Mean=3.67, Mean=1.68, respectively) (P<.0001). However, most of them (76.60 %), found it very convenient specially when staying in the safe environment of home was the most important need of the time as in COVID- pandemic. In that hour of the need, an opportunity to learn by e-learning was very promising. Reduced interaction with the teacher was indeed the single disadvantage highlighted by most participants (P= 0.0075). A total of 25 (13.30%) respondents rated e-learning as enjoyable. There was statistically significant difference between answers given by students in the years of studies (P=0.004).

Conclusion: The use of online teaching platforms has helped in minimizing the disruption in medical teaching caused by the Covid 19 pandemic. Integration of both e-learning and campus-based learning would be beneficial in future medical teaching allowing for more flexibility of learning.

Keywords: e-learning, covid-19 pandemic, challenges, medical students, impact

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Introduction

WHO declared Coronavirus Disease 2019 (COVID-19) a pandemic in March 2020. To date, millions of people have been affected.¹ The disease has not only taken a toll on the health system but the nationwide lockdowns that were implemented to contain the spread of the disease resulted in the closure of the educational institutes as well.²

This posed a considerable challenge for medical education, as the teachers must deliver the lecture in a safe environment while making sure that the integrity and steadiness of the medical education process are

not affected.³ Medical schools had to suspend clinical rotations and observations in hospitals, general practice as well as community settings. This may result in the decline of clinical skills competency of the students and adversely affect their future training.⁴ E-learning was therefore implemented worldwide in order to provide students with opportunities for continuous learning.⁵ The common methods used for E-learning were scheduled live online video lectures with interactive discussions along with prerecorded teaching material which was provided to the students so that they can learn at their own pace.⁶ The socioeconomic status of a country also plays a vital role in the educational progress of the students. Students residing in countries with high socioeconomic status are reported to have faced less difficulty in pursuing their education due to the easy accessibility of the resources⁴. However, the students residing in middle or low-socioeconomic-status countries have had difficulty in arranging electronic devices and the unavailability of a stable internet connection to a number of places has also added to the problem.⁷ It is due to the same reasons that the majority of students in Pakistan have been reported to have a negative perception of online teaching methods.⁸

We undertook this study to assess the impact of online teaching methodologies on medical students of Pakistan. This will help us to understand the willingness of medical students to acclimate to this new environment of online learning.

Material and Methods

A cross-sectional study was conducted from 16th September 2021 to 16th October 2021. The research questionnaire constructed on Google Forms was disseminated via online social media platforms (Facebook, WhatsApp, and Gmail) amongst the medical students at various colleges in Pakistan. The study included all undergraduate medical students studying in Pakistan. Residents as well as postgraduate students were excluded. The respondents were told about the objectives of the study, and it was voluntary participation. A total of 188 students took part in the study. The research was approved by the Institutional Review Board of CMHLMC & IOD. Items in the questionnaire were based on previous literature (Bączek M et al)⁹; some questions were modified taking into account the local conditions. The questionnaire contained four parts. The first section was about participants' general

information. They were required to provide their age, gender, academic year, medical college, number of siblings, family's monthly income, and access to computer and internet services). In the second section of the questionnaire, the existing IT knowledge of the students was evaluated whether they have taken any online courses of any sort in the past. They were given six options regarding the benefits and shortcomings they faced during eLearning. They were able to choose as many options as they think were appropriate. The third section of the questionnaire used a Likert scale (1-extremely ineffective, 5-extremely effective) for comparison of face-to-face learning and e-learning as regards acquiring knowledge, clinical and social skills. Moreover, the students were also asked to rate their participation during classes ranging from extremely inactive to extremely active. It was scaled from 1 to 5 (1 being extremely inactive, 5 being extremely active). The Likert scale was used to mark the acceptability level of students for the online learning sessions (1-extremely unenjoyable, 5- extremely enjoyable).

The data were analyzed with (Excel - 2019, IBM SPSS Statistics 26.0, Minitab - 17, and MedCalc) statistical software. Descriptive statistics were used to evaluate the benefits, disadvantages and acceptability level of eLearning among the students. Comparison between face-to-face learning and online learning experience was done by using the nonparametric Wilcoxon signed-rank test. The Chi-square and Mann – Whitney tests were used to compare answers given by students belonging to different academic years. $P < 0.05$ was considered statistically significant.

Results

The study included 188 participants out of which 72 (38.30%) were male while 116 (61.70%) were females. All of them have an age between 17 to 27 years with a mean of 21.165 and $SD=1.884$. 44 students already had some experience of online learning, they comprised 23.40% of the total students. However, the majority (76.60%) had no previous eLearning experience. IT skills of 19 respondents (10.11%) were determined to be high while 127 participants showed moderate awareness and 42 (22.34%) had minimal IT skills. The convenience of staying at home was the most frequently selected advantage by the majority of respondents (76.60%) followed by the access to online material (52.13%), facility of access to online materials (52.13%) and

learning at their own pace (55.85%). A few of the students (8.51%) highlighted class interactivity also. The main disadvantage of e-learning was found to be reduced interaction with the teacher (P= 0.0075), and lack of self-discipline (P=0.0070). The difference between face-to-face and online learning was found statistically significant (P<.0001). These were recorded in terms of opinions about improving clinical skills and social interactions (**Table-1**). Students assessed that they were less active during online classes (Mean=3.39) compared with traditional classes (Mean=2.40)

Table 1: Demographics of the study population (n=188)

Demographic Characteristics	n (%)
Gender	
Male	72 (38.30 %)
Female	116 (61.70 %)
Age	
17 – 20	62 (32.97 %)
21 – 24	121 (64.36 %)
25 – 28	5 (2.65 %)
Year in medical school	
First Year	51 (27.13 %)
Second Year	17 (9.04 %)
Third Year	52 (27.66 %)
Fourth Year	44 (23.40 %)
Final Year	24 (12.77 %)
Family's Monthly Income	
Less than 100,000	85 (45.21 %)
Between 100,000 - 200,000	51 (27.13 %)
Between 200,000 - 400,000	31 (16.49 %)
>400,000	21 (11.17 %)

Where do you live?	
Urban Settlement	125 (66.49 %)
Semi - Urban Settlement	45 (23.94 %)
Rural Settlement	18 (9.57 %)
Family Members	
3 - 6 Members	138 (73.40 %)
7 - 9 Members	44 (23.40 %)
10 - 12 Members	5 (2.66 %)
Room of you own or do you share	
Yes	76 (40.43 %)
No	112 (59.57 %)
Devices do you own?	
Smart-Phone	187 (99.47 %)
I-pad or Tablet	23 (12.23 %)
Laptop	126 (67.02 %)
Desktop Computer	17 (9.04 %)
Buy a new device?	
Yes	39 (20.74 %)
No	149 (79.26 %)
Internet access at home or currently studying?	
I don't have internet access and I have to go somewhere else	9 (4.79 %)
Prepaid mobile data	64 (34.04 %)
Postpaid internet subscription, but the connection is slow and/or unreliable	46 (24.47 %)
Postpaid internet subscription, but the connection is fast and reliable	69 (36.70 %)
IT skills	
Low	42 (22.34 %)
Moderate	127 (67.55%)
High	19 (10.11 %)
Participated in e-learning before the pandemic?	
Yes	44 (23.40 %)
No	144 (76.60 %)

Table 2: Advantages and disadvantages of e-learning

Advantages of e-learning?	First Year	Second Year	Third Year	Fourth Year	Final Year	P-value	n	Percentage (%)
Access to online materials	23	7	33	25	10	0.506	98	52.13%
Learning at your own pace	22	9	34	28	12	0.686	105	55.85%
Convenience of staying at home	33	12	41	38	20	0.466	144	76.60%
Classes interactivity	0	2	3	8	3	0.209	16	8.51%
Ability to record a meeting	18	3	28	18	11	0.679	78	41.49%
Comfortable surrounding	15	11	23	25	15	0.301	89	47.34%
Disadvantages of e-learning?								
Reduced interaction with the teacher	42	11	36	30	20	0.843	139	73.94%
Technical issues	37	9	39	36	19	0.128	140	74.47%
Lack of interaction with patients	30	7	40	35	19	0.653	131	69.68%
Poor learning conditions at home	34	6	23	18	10	0.826	91	48.40%
Lack of self-discipline	32	8	29	31	18	0.180	118	62.77%
Social isolation	24	8	23	20	11	0.259	86	45.74%

($P < .0001$) (**Table- 2**). A large majority of students (106 i.e., 56.38 %) did not enjoy the online learning experience. For 31.92% of them, it was extremely unenjoyable. On the other hand, only 25 respondents (13.30%) found it enjoyable, among these, 12 found it extremely enjoyable while others found it somewhat enjoyable. There was a statistically significant difference between answers given by students belonging to different academic years. ($P=0.004$). There was no statistical difference between female and male students ($P=.595$).

Discussion

Quoting a famous saying by Dickens, “it was the best of times, it was the worst of times” might have been written for the covid pandemic. For those of us used to the age-old methods of conventional campus-based education, this was the worst of times. However, this was an excellent opportunity for the opening of new horizons especially distant learning with flexible options.¹⁰ Medical colleges had a delicate task to balance the need for mentoring, face-to-face contact, and supervision which play an important role in the development of higher-order cognitive skills, in the pandemic. Use of e-Learning tools have expanded rapidly, and the use of mobile phones and online technology is getting increasingly accessible.¹¹ In the present study, the overall feedback of the students concluded that in terms of developing skills, face-to-face interaction was seen to be more effective than e-learning. Students considered themselves being less active during online classes (Mean=3.39) compared with traditional face to face classes (Mean=2.40). This is consistent with a study in which overall preference of students for online teaching was lower (1.69) as compared with face-to-face teaching (2.55).⁷ However, in another study, 67% students were satisfied with their E-learning experience.¹² Reasons for students’ preference might be the unexpected sudden introduction of online teaching, inadequate preparedness of the faculty and technical difficulties. Among the advantages of e-learning, the frequently cited benefits of e-learning chosen by the respondents was the convenience of staying in their houses (76.60%). This is comparable to a research in which the respondents identified "time efficiency" (15.7%), "convenience" (14.7%), and "accessible" (11.6%) as the top three benefits of e-learning.¹³ In the present study, the respondents were asked a number of questions related to the pros and cons of e-learning. Besides the advantage of convenience of

staying home, learning at their own pace (55.85 %), comfortable surroundings (47.34%) and ability to record a meeting (41.49 %) were among the other major advantages noted by the students. In a study done in Jordan in undergraduate students of Ophthalmology, the major advantages noted by 95.5% of the respondents was flexibility of e-Learning to time and place.¹⁴ Another research conducted in Pakistan which examined medical graduates' opinions of online education during the Covid19 outbreak found that the students approved of its integration into the existing teaching methodologies. Although they were of the view that e learning was not flexible in learning process, but it saved time.¹⁵ In our study, no distinction existed between the male and female respondents to the acceptance of e-learning. However, in another study, female students demonstrated a more positive attitude towards e learning as compared to male students.¹⁶ In the present study, almost 76% of the participants had never participated in e-learning before the covid pandemic. This is understandable as the current generation never faced a calamitous pandemic of this magnitude. This is similar to another study done in Zimbabwe where 85% of the respondents had no prior experience of using any e-learning platform before the covid 19 pandemic.¹⁷ In another study conducted in Sudan, 24 % reported that they were unfamiliar with E-learning systems.¹⁸ In the current study, the major drawbacks cited by the students were reduced communication with the teacher, technological issues, lack of interaction with patients, poor learning conditions at home, lack of self-control and social isolation. One of the reasons for these might be the sudden start on e-learning for which the students and the teaching faculty were not ready. In another study conducted in Jordan, the most common challenge faced by the students was internet connectivity issues (33.5%), followed by the feel of anxieties (25.9%), not having a separate room to study at home (22.5%), and not having a device to attend online classes (18.1%).¹⁴ One of the causes might be students in remote and rural places experiencing bad internet access. The present study was conducted to help understand the impact of e-learning on the medical students and their willingness to adopt to the change. More studies like this need to be carried out to have a broader picture of the online platforms and its impact on the future of students. One of the limitations in our study was the small sample size, owing to the poor response from the students in filling the questionnaire in due time.

Conclusion

The use of online teaching platforms has helped in minimizing the disruption in medical teaching caused by the Covid 19 pandemic, allowing for the delivery of uninterrupted medical education to students. This article addresses a gap in our understanding of the potential of e-learning and the difficulties faced by the students and teachers to implement it.

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Authors Contribution

KHC, AA: Conceptualization of Project

KHC, MR, AA: Data Collection

KHC, FZ: Literature Search

MI, AA, BAG: Statistical Analysis

KHC, MR, AS: Drafting, Revision

KHC, MR, FZ: Writing of Manuscript