DOI: https://doi.org/10.53350/pjmhs22169155

ORIGINAL ARTICLE

Impact of the Covid-19 Pandemic on Medical Education among Students of Lahore, Pakistan: Medical Students' Knowledge, Attitudes, and Response Regarding Online Learning

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ABSTRACT

Background: COVID-19 was announced as a pandemic issue globally on 11th March, 2020. In response to this situation, all educational activities including medical and clinical education in various colleges across the country were suspended on the 15th of March. So, online education emerged as an alternative method of teaching & learning to maintain continuity of education
Aim: To evaluate the use of online learning modalities and to find their feasibility and usability in medical education.
Methods: A cross-sectional study was performed across the government and private medical colleges of Lahore. Eligible participants were undergraduate medical students from 10 medical colleges of Lahore. A questionnaire linked to a Google form was distributed to the medical students across 10 government and private medical colleges through different social platforms.
Results: A total of 439 valid questionnaires were collected. 31.7% of students disagreed that interaction between students and teachers was possible through online teaching. Only 7.7% of students agreed that online learning can be used for clinical teaching of medical sciences, as compared to 35.8% who disagreed with this answer and 12.8% who were neutral. 23% of the students agreed that online learning was more convenient and flexible than traditional learning, while 24% disagreed and 21.4% were neutral in this regard. Only 19.8% of students had problems with poor internet services.
Conclusion: As Pakistan has faced four waves of the COVID-19 which is not over yet due to the emergence of new strains. Due to vaccination of medical students medical education is back to conventional physical learning but online learning has gained importance as an effective alternate to continue learning processes in exceptional situations like COVID-19 pandemic.
Keywords: Covid-19 pandemic, online education

INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) has affected the medical education and healthcare systems globally[1]. The high contagious issues of the disease has made it difficult to continue educational activities, as usual, thus affecting the medical education system, which usually consists of physical lectures and patient-based education[2]. This abrupt transition of medical educational activities from conventional to completely new online learning is quite challenging for both instructors and students.3-4 Online learning involves the use of information technology for enhancement of both teaching and learning using online content such as live lectures (video streaming), video conferencing, webinars, e-mail discussion forums, and Whatsapp groups[5,6]. Online learning has gained special importance during this pandemic because it has a better reach, getting people on board from many different areas at one forum.

Correspondingly, online learning has several drawbacks such as less effective online strategies, lack of motivation for the students, insufficient communication skills, and students from poor socioeconomic status having inaccessibility to online equipment and internet. Besides this, in online learning platforms, interaction between teacher and student is also difficult to reproduce like in real-time. Developed countries like the UK, France, and the United States are already practicing online learning through an effectively developed IT system but Asian countries particularly South Asian countries including Pakistan are lagging behind in online learning[7,8]. Necessary infrastructure and optimal internet connection all across the country are needed for effective online learning.

Despite all these facts, In Pakistan online learning in medical education got a place during these unprecedented times which is providing the best opportunity to incorporate information technology more effectively into the medical education system. Therefore, it is necessary to assess its feasibility determine whether it is sufficient in aiding medical students continue their educational activities. In this study, we aim to explore the students' knowledge, attitudes, and response related to online learning in medical education.

This study also aims to determine the barriers to online learning and their effects on medical education in Pakistan.

Received on 13-04-2022
Accepted on 16-08-2022

METHODS

It was a cross-sectional study which was conducted by an online survey among undergraduate medical students from all the MBBS Professional years (i.e. 1st year, 2nd year, 3rd year, 4th year, and 5th year). Participants were from more than 10 medical colleges (government and private) of Lahore. The study was conducted from July 2021 to September 2021. There was no age or gender restrictions for the participants. Voluntarily willing students were the participants of this study. Non-probability convenient sampling technique was used to recruit the participants. The estimated sample size (n=384) was derived from the online OpenEpi calculator (OpenEpi, Version 3, open-source calculator—SSPropor)

A modified pre-designed questionnaire was used as a study tool. A Google Form having the online questionnaire was distributed among specific social media groups (Whatsapp groups) of the undergraduate medical students of government and private medical colleges. In this online version, a specific question related to medical students' registration status and their college name was used to confirm their appropriate inclusion. Those students who showed their interest in the questionnaire participated in the study and provided their responses. The response provided by the medical students was retrieved through Google drive and was saved in a Google spreadsheet automatically. Questionnaires with incomplete answers or lacking appropriate data were excluded from the study.

Questions were in three separate formats, closed-ended, multiple-choice and rating questions on a five-point scale (Likert

scale). The questionnaire retrieved participants' basic demographic information like gender, academic years and medical school. The questionnaire collected information about the status of educational tools during the COVID-19, knowledge of medical students related to online learning modalities, the attitude of medical students toward online learning, medical student's practice evaluation of e-learning, barriers in online learning and the effect of COVID-19 on the overall medical education process. All the collected information was entered and analyzed using SPSS version 21.0. Numerical data were presented as frequencies and percentages.

RESULTS

Basic demographic characteristics: A total of 439 students were included in this study. Participants were predominantly female; including 273 female (63.2%) and 166 (37.8%) male participants. A greater number of the participants included 4th year medical students (212; 48.3%), followed by 3rd year (90; 20.5%), 2nd year (58; 13.2%), 1st year (53; 12.1%) and final year (26; 5.9%) students.

Use of educational technology tools during the COVID-19 pandemic: The use of electronic devices was acceptable to 33.9% of the population (149 participants) while only 8.9 % (39 participants) found it proficient. The majority of them (149; 33.9%) and (139; 31.7%) reported that they had access to an acceptable and good internet connection, respectively. 53 participants (12.1%) reported that they had weak internet connection while only 39 participants (8.9%) had access to excellent internet quality. The majority of students (231; 52.6%) used smartphones during online classes in pandemic while just 38.3% (168 participants) used laptops to take online classes (Table 1).

Knowledge of medical students toward online learning: 40.8% (179 participants) agreed that online learning is an interactive system that helps in learning through telecommunication. 50.6 % of participants didn't give their opinion. 35.1% (154 participants) considered that E-learning is less expensive than conventional learning while 43% (189 participants) didn't give their opinion (Table 2).

Medical student's practice evaluation of online learning: The majority of the students (399; 90.8%) reported that they use the internet regularly in their daily studies. Only 33.5% (147 participants) purchased electronic devices to access online learning while 66.5% (292 participants) already had these devices. The majority of them (302; 68.8%) utilized their personal computer for online learning (Table 4).

Barriers in online learning: During the pandemic, 77.9% of students were able to take online classes at their homes. The majority of the students (217; 49.4%) got smooth internet connection during class time while 38% of participants complained of interrupted internet access during an online class. 73.8% (324 participants) faced audiovisual problems during online classes. 33.7% found online classes costly while 59.7% didn't find it costly. 74% of students reported that sometimes time duration was sufficient for a single class while 18.5% of participants denied it. The majority of the students (58.3%) could not ask questions from their instructors at the end of the online class. (Table 5).

Effect of COVID-19 on the medical education: During pandemic, 42.8% of the faculty suspended or postponed their educational program while 57.2% continued their educational program. 64.9% of students reported that faculty suspended their clinical training programs.

Table 1: Use of Educational Technology Tools during the COVID-19

	Frequency	%age
Proficiency level in using various electronic devices		
Inadequate	53	12.1
Acceptable	149	33.9
Good	139	31.7
Very good	59	13.4
Proficient	39	8.9
Quality of internet service		
Bad	87	19.8
Acceptable	153	34.9
Good	139	31.7
Very good	47	10.7
Excellent	13	3.0
Items owned and used in medical education		
Computer	12	2.7
Tablet	25	5.7
Laptop	168	38.3
Smartphone	231	52.6
Other	3	0.7

Table 2: Knowledge of Medical Students toward Online Learning

	True N (%)	False N (%)	I don't know N (%)
Online learning is an interactive system that provides learning through information and telecommunication technology	179(40.8)	38(8.7)	222(50.6)
Online learning in the medical field is not considered less expensive than traditional learning	154(35.1)	96(21.9)	189(43.1)
Online learning provides a digital multimedia content (written text, audio, video, and images	81(18.5)	18(4.1)	340(77.4)

Table 3: The Attitude of Medical Students toward Online Learning

	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly Agree N (%)
Interaction between students and lecturers is possible through online learning	7(1.6)	139(31.7)	159(36.2)	77(17.5)	57(13.0)
Online learning can be used for Clinical aspects of Medical Sciences	187(42.6)	157(35.8)	56(12.8)	34(7.7)	5(1.1)
Online learning can cover the practical aspect of the medical education curriculum	214(48.7)	154(35.1)	4.4(10.0)	21(4.8)	6(1.4)
Downloadable online learning content is better than Live content	64(14.6)	82(18.7)	104(23.7)	148(33.7)	41(9.3)
Online testing can replace the current traditional testing methods in medical faculties	148(33.7)	143(32.6)	74(16.9)	53(12.1)	21(4.8)
Online learning is more convenient and flexible than traditional learning	100(22.8)	109(24.0)	94(21.4)	101(23.0)	35(8.0)

Table 4: Medical Student's Practice Evaluation of Online Learning

	Yes	No
Used internet regularly in studies	399(90.8%)	40(9.1%)
Purchased an electronic device to have access to online learning opportunities	147(33.5%)	292(66.5%)
Utilize personal computer in online studying	302(68.8%)	137(31.2%)

Table 5: Barriers in Online Learning

	Yes N (%)	No N (%)	Sometimes N (%)
Have to go to an institution or away from home to attend online classes in pandemic	62(14.1)	342(77.9)	35(8.0)
Get uninterrupted internet access during class time	217(49.4)	167(38.0)	55(12.5)
Faced audiovisual problems during online class	324(73.8)	55(12.5)	60(13.7)
Found online classes costly	148(33.7)	262(59.7)	29(6.6)
Thought time duration was sufficient for a single class	325(74.0)	81(18.5)	33(7.5)
Asked questions during the class	256(58.3)	138(31.4)	45(10.3)
Needed any technical support for the online class	172(39.2)	231(52.6)	36(8.2)

DISCUSSION

To assess the knowledge, attitudes, and practices concerning online learning, this study was conducted to evaluate the medical students' perceptions and circumstances that they have come across during the COVID-19. The target population of this study included the undergraduate medical students of all years from 10 medical colleges of government and private sector of Lahore and covers the number sample size 384. Analysis of the study revealed the experiences of financial, technical, and educational issues that students have gone through during the use of online learning modalities in the unwelcomed era of pandemics.

This study found that only 22% were satisfied with the proficiency level in using various electronic devices while 47% were not. The majority (about 55%) of the students were also not happy with the quality of the internet services. This showed that we are lagging in providing efficient technological services in the time of 4G and 5G. Most of the students can join the online classes only because they have owned items that are used in medical education.

Smartphones (53%) and laptops (38%) are more frequently used items than others (personal computers, tablets). A study of Nepal also showed that the availability of smartphones (74.6%) laptops (48.8%) and desktops (1%) is considered as a major influencing factor responsible for the involvement of students in online classes[17]. The majority (48%) of students disagreed regarding interaction between students and teachers was possible through online learning, only a minority (14%) of students showed a positive response in this concern.

A study done in Croatia revealed that half of the students miss in-person communication with teachers (52.5%) and classroom lessons (47.5%)[18]. In the same study, the response of teachers regarding online education was also not welcome. they were concerned about the declining performance of students and the interaction gap that has developed between students and teachers via online education[18.] Undergraduate students of our study also worried about their clinical and practical aspects of the medical education curriculum because of the transition in learning mode. The bulk of the students (42.4%) disagreed regarding the education of practical and clinical skills through online learning. However, a flexible number of students also agree that online learning is more convenient than traditional learning.

The study of Croatia also indicated that the implication of e-learning to all aspects of education is not fruitful especially in medical education where direct contact with patients and the clinical skills need to be practiced, which are not possible via e learning.18 Iranian medical students (58.3%) also agreed that the classic and traditional way of learning is much better than online learning. While Saudi students have different perspectives regarding online learning, they consider it more convenient than on-campus learning[17].

The abrupt change in the learning style due to the COVID-19 pandemic leads to certain evolving problems among the students of Pakistan. As a developing country, Pakistan is already struggling to overcome the barriers in the path of education, which are somewhat worsened by the pandemic. Some students (14.1%) have to go to institutions or away from home to attend online classes in this pandemic while the majority (77.9%) stays at home. Availability of uninterrupted internet connection to most of the students (49.4%) helps them to attend the online classes, while a significant number (38%) are still facing the issue of internet connection. Another barrier in the path of online learning is audio-visual problems that the majority (73%) of the target population is still facing. Some (33.7%) considered online classes costly, and the majority (59.7%) did not think like that. Another aspect of education that is assessed in this study is the suspension of educational and clinical training programs by faculty due to the COVID-19 pandemic. More than fifty percent (57.2%) of the target people said that education and training programs are not suspended.

By comparing the perceptions and experiences of our students with international data it is found that they have modified their resources and educational system in such an innovative and creative manner that provide their students additional opportunities to conduct ongoing assessments and training programs even if they are far from their institutions.19 Along with the educational and training programs, career plans or future interests of students are also affected by the waves of pandemics. Some students (15.5%) have developed an interest in public health and infectious diseases, while most of them are still unaffected (40.5%)

CONCLUSION

As Pakistan has faced four waves of COVID-19, so it is not over yet due to the emergence of new strains. Due to the vaccination of medical students, medical education is back to conventional physical learning but online learning has gained importance as an appropriate alternative to continue learning processes in exceptional and emergency situations like COVID-19 pandemic. Technical and logistical resources remains a big challenge for the provision of online learning, so understanding technological, financial, institutional, teachers and student barriers are very much important for the successful implementation of online learning in medical education.

Conflict of interest: Nothing to declare

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