Medical and Dental Students' Perception of Online Learning across Pakistan in the COVID Pandemic Era: A Review Article

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ABSTRACT

The widespread lockdowns due to the COVID pandemic led to an abrupt shift in the medical education sector from a conventional to an online education system. The aim of this study was to determine the perception of medical and dental students regarding the acceptance of e-learning in Pakistan. A thorough literature search was conducted on PubMed and Google Scholar; six articles were included in this review.

Perceptions of students regarding online medical learning were compiled. These perceptions were related to both non-clinical subjects as well as the attainment of clinical skills through online education. This review also highlights online educational challenges such as the level of student-teacher interaction, internet connectivity issues, and perception of fairness in online assessments.

Online learning during COVID pandemic has not been a successful mode of learning for undergraduate medical and dental students across Pakistan. This specifically stands true for the learning of clinical and laboratory skills.

Keywords: Student perception, e-learning, COVID-19, SARS-CoV-2, medical education, digital literacy.

INTRODUCTION

E-learning has drastically evolved teaching methods all over the world [1]. Both E-learning and medical education are emerging fields with an increased emphasis on student-centred learning approaches. Medical educationist support e-learning and integrated systems [2]. The advantages of e-learning include its ease of use, flexibility in terms of place and time, and better control over the environment [3]. Thus, e-learning was gradually evolving in the medical sector of Pakistan [2, 4]. However, the COVID-19 pandemic abruptly changed the dynamics of workplace-based practices all over the world including the closure of academic institutions [5]. The medical education sector was also impacted [6, 7]. A country-wide lockdown was implemented in Pakistan in March 2020, leading to a sudden shift to online teaching [8].

Traditionally, medical and dental education in Pakistan has been taught using a traditional face-to-face approach [9]. Unlike other higher education sectors such as Computer Science, Business Management and Engineering, Medical education was not at all accustomed to an online mode of education [10]. The COVID pandemic resulted in an unprecedented paradigm shift in medical and dental education in Pakistan to e-learning. Unlike other fields, health professionals were at an increased risk of contracting the virus, hence it was important to ensure the safety of medical and dental students [11]. This made the transition an unavoidable necessity. However, due to the unpreparedness of the medical and dental education sector, they faced more challenges compared to other educational sectors. This was significantly more troublesome in developing countries like Pakistan [9, 12]. Based on all this, Baig *et al.* called Pakistan's dental education sector in relation to e-learning to be in the "teething stage" [13].

Several studies discussed the challenges faced due to this sudden transition of learning in medical education from traditional face-to-face learning to online learning [11, 14-17]. Firstly, the learning curve for students in online learning was quite different. Moreover, neither the teachers nor the students were prepared for the transition of clinical teaching *via* online learning [14, 18]. Other issues such as internet connectivity; other IT-related issues; lack of student and/or teacher engagement; lack of teachers' preparedness and competence in the use of digital tools and lack of support for using digital tools were some of the challenges faced in medical and dental education [9, 14, 19].

Connolly and Stansfield (2006) have described three phases of e-learning. The first generation from 1994-1999 used the internet passively with traditional material only reorganised into an online format [20]. The second generation from 2000 to 2003 was marked by a noticeable transition towards a virtual learning

environment where students have access to their course material and various student services provided. The third generation currently was described as having more project or app-based learnings where various platforms are created to provide easy access for learning [20]. As per these phases, medical and dental education in Pakistan suddenly transitioned from the first to the third phase. This abrupt transition was challenging for institutes, teachers, and students.

Documented student feedback is imperative for the improvement and evaluation of the education system [21]. O'Doherty *et al.* reported that the students' perceptions of the learning environment have a significant association with their learning [22]. Student perceptions related to this sudden transition and the overall online learning experience have been reported by several studies in Pakistan. However, the majority of these studies have been done in single cities reporting isolated results. The present review aimed to collectively assemble and present a unified report of the medical and dental students' perceptions regarding online learning in Pakistan, both positive and negative. How a student perceives a teaching methodology impacts the effectiveness of the particular method. Therefore, the perception of medical and dental students in Pakistan is of prime importance, and their opinions matter in this regard.

The aim of this study is to determine the perception of medical and dental undergraduate students regarding the acceptance of e-learning in Pakistan.

METHODS

A thorough literature search was conducted on PubMed and Google Scholar using the following keywords: student perception; online learning; e-learning; COVID-19; Pakistan; SARS-CoV-2; medical student and dental students. BOOLEAN operators OR and AND were used to build the search strategy. Only articles published after January 2020 were included in the study. Any article that was conducted outside Pakistan before the COVID-19 pandemic or on non-medical students was excluded from the study.

The initial search resulted in 8 articles. A total of 2 articles were excluded after scanning the titles and abstracts. Based on reading the full texts, a final list of six articles were included in the review.

RESULTS

Teacher–Student Communication

A total of three studies reported good teacher-student comminution during online classes as students felt comfortable asking questions and interacting with teachers during online learning sessions. However, two studies reported that the level of teacher-student interaction decreased during online classes.

Kamal *et al.* also shared their faculty perspective regarding the dire need for students to participate in e-learning sessions. They mentioned "If they don't take an interest, then no motivation is there. The majority are least bothered by fulfilling assignments (**Table 1**) [7, 23-27].

Learning Environment

A total of two studies reported a positive learning environment for e-learning. A study conducted by Mukhtar preferred the comfort of learning reported that a significant number of students preferred the comfort of teaching from home. Another study by Sarwar *et al.* (2020) also reported that online learning had an overall positive impact on learning [26]. However, another study conducted by Mukhtar *et al.* (2020) also highlighted the lack of discipline in online learning and its effect on the entire learning environment of the class [25]. Sharif *et al.* (2020) found an unfavourable learning environment from home as they reported difficulty in learning at home. Kamal *et al.* highlighted the need for the establishment of a strong IT department in medical and dental institutes [7] (**Table 1**).

Learning Resources

Two studies found online learning resources to be favourable for online learning. Ansar *et al.* (2020) reported an overall positive perception of online teaching as students had improved access to learning resources [10]. Mukhtar *et al.* (2020) also reported similar results that students find it easy to access their learning resources at any time [25]. However, Sarwar *et al.* (2020) found that students reported the learning resources available to them were of poor quality [26] (**Table 1**).

DISCUSSION

The six included articles were evaluated for positive and negative medical and dental students' perceptions regarding online learning.

Three themes were identified from the included articles.

1. **Learning (Knowledge and Skills)**
   Learning, (knowledge and skills) were adversely affected in all the studies cited. The pandemic allowed little time for evolving robust alternate systems for medical education where acquiring clinical skills is paramount. Now that the pandemic is receding, perhaps it is the right time to plan for possible future events so that reliable alternate systems are in place before another calamity strikes.

2. **Digital Tools**

   The resources for the delivery of course content *via* E-learning include electronic media, such as the internet, audio/video tape, interactive TV, and CD-ROM, *etc.* None of the students received digital tools in Pakistan medical universities. Lectures were conducted online and internet connectivity was the

Table 1: Artcles' review based on e-learning.

S. No	Author(s)	Article Title	Sample	Positive Perceptions of E-learning	Negative Perceptions of E-learning
1.	(Abbasi *et al.* 2020)[23]	Perceptions of students regarding E-learning during COVID-19 at a private medical college	Undergraduate medical and dental students. Sample size= 377	None	1. Quality of e-learning is unsatisfactory 2. Decreased student-teacher interaction 3. Online education presents security issues and is not perceived as a secure medium 4. Students prefer traditional teaching to online teaching as it is less impactful 5. in the future students would prefer traditional teaching to online learning
2.	(Sharif *et al.* 2020)[24]	Perception of dental students regarding online classes during the pandemic	Undergraduate dental students Sample size= 450	1. There is a gain of theoretical knowledge 2. Good interaction with teachers during online learning	1. No improvement in clinical skills 2. Unfavourable learning environment in online classes 3. Difficulty in learning from home during online lectures 4. Not confident about taking an exam after attending online classes 5. Internet connectivity hinders learning online
3.	(Ansar *et al.* 2020)[10]	Undergraduate students' perception and satisfaction Regarding online learning system amidst COVID-19 pandemic in Pakistan	Undergraduate medical students Sample size= 200	1. Convenient availability of course materials 2. Effective use of technology can improve online learning 3. Online learning can ensure easy availability of information about course requirements	1. Fairness of online exams is questionable as they are perceived inaccuracies in assessments methods by students 2. Students prefer traditional teaching to online teaching 3. Students face difficulty monitoring their academic progress with online courses 4. Students are unable to ask questions from instructors in their online courses.
4.	(Mukhtar *et al.* 2020)[25]	Advantages, Limitations and Recommendations for online learning during the COVID-19 pandemic era	Undergraduate medical and dental students Sample size= 12 (6 from MBBS and 6 from BDS)	1. It enables the continuation of learning during the pandemic 2. Online teaching provides the teachers with better control over the teaching process 3. Students can easily communicate with teachers through multiple online mediums 4. Students can learn from the comfort of their homes. 5. Asynchronous online learning enables students to easily access lectures and resource material repeatedly 6. Online learning provides a Student-centred learning approach and enables learners to carry out Self-directed learning	1. Students are unable to learn skills 2. There is a lack of student feedback 3. Students experience a lack of continuity in lectures and are unable to focus on e-lectures 4. As students know they will get the online learning material in form of recorded lectures they show a lack of attentiveness 5. Lack of resources to purchase gadgets required for online learning creates a stressful situation for students 6. Lack of discipline during online classes 7. Difficulty in maintaining academic integrity due to the novelty of the system. More chances of plagiarism during online assessments
5.	(Sarwar *et al.* 2020)[26]	Self-Reported Effectiveness of e-Learning Classes during COVID-19 Pandemic: A Nation-Wide Survey of Pakistani Undergraduate Dentistry Students	Undergraduate dental students Sample size= 1207	1. Good internet connectivity during online classes 2. Sufficient time is allotted for online learning 3. Students can interact with teachers easily during and after online sessions and each student is given the opportunity to interact in the online session	1. Flawed institutional learning management system 2. Dissatisfaction with learning resources 3. Poor quality of online learning resources 4. Dissatisfaction with the training of teachers for online classes 5. Difficulty in focusing on online classes when taken from the home. 6. Online learning is less effective compared to classroom teaching 7. Students were not satisfied with the assistance they received during online classes 8. Students are unable to learn laboratory/clinical skills in online learning

S. No	Author(s)	Article Title	Sample	Positive Perceptions of E-learning	Negative Perceptions of E-learning
6.	(Saeed *et al.* 2021)[27]	E-Learning Experience of Medical and Dental Students from Private Colleges of Karachi, During COVID-19	Undergraduate medical and dental students Sample size= 446	1. Online learning was made more effective by the use of images in e-lectures	1. Internet connectivity hinders learning online

major barrier. This indicates that if connectivity and access issues are resolved and infrastructure is improved, online education can be an effective tool in medical and dental education.

3. Academic Integrity

None of the students have shown any positive results regarding academic integrity. According to the student's perception, online examinations were found to have a questionable assessments. Without the proper means of invigilation, the conduct of any exam was also found to be doubtful. Hence it would be advised to have proper measures before conducting any exam online to maintain academic integrity.

CONCLUSION

To summarize the perception of medical and dental students regarding the acceptance of e-learning in Pakistan online learning during the COVID pandemic has not been a successful mode of learning for undergraduate medical and dental students across Pakistan, particularly due to unpreparedness and sudden transition to e-learning. The level of student-teacher interaction was found to be compromised on many levels. Secondly, internet connectivity issues were a major barrier to the failure of e-learning in Pakistan. Thirdly, the perception of fairness in online assessments was also found to be questionable. Furthermore, based on students' perspectives analysed in this review, this specifically stands true for the learning of clinical and laboratory skills which are compromised without hands-on practice.

LIMITATIONS

A limited number of studies were included in this review article thus, there were a limited number of participants and only a few medical universities conducted the study to analyse e-learning and this has a major impact on this review because different universities have different infrastructures. In addition, the methodology and questionnaire used in all the studies were non-uniform and this impacted the study in generating a uniform result. Finally, the studies evaluated were performed during different timelines of the pandemic and this affect this review as universities were suffering during the initial periods and were more organized in the later stages of the pandemic for e-learning.

FUTURE RECOMMENDATIONS

Based on the findings of this review, the faculty and students could be given regular training to gain expertise

in e-tools and e-resources and to keep abreast with the latest developments in online teaching and learning. Despite the fact that documented student feedback is imperative to improvement and evaluation, similar studies should be carried out to assess teachers' perceptions of online learning as well, as this will help to evaluate the challenges faced by the teachers during the pandemic. Our review article provided a summarized review of research from multiple cities conducted on medical and dental undergraduate students to evaluate perceptions of online learning; a similar study should be done for medical and dental postgraduate students as well to study the challenges faced by post-graduate students during the pandemic to analyse whether coping with e-learning was just a challenge for undergraduates only with their limited knowledge about the usage of internet or it was a challenge for postgraduates too.

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