

Students' Perception on Online Teaching and Learning during COVID-19 Pandemic in Medical Education

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ABSTRACT

Introduction: The COVID-19 pandemic has changed the method of learning in medical education and forced us to switch over to the online mode of learning. The aim of the present study was to assess students' opinion on online learning in the time of COVID-19.

Method: This is a descriptive cross-sectional questionnaire-based study conducted among undergraduate medical students. The closed, open-ended and validated questionnaires were administered to students to get feedback on utility, feasibility, suitability, effectiveness online learning as well as problems faced during e-learning and suggested solutions to them.

Results: About 62.7% of undergraduates had internet access. Sixty seven percent of undergraduates were willing to actively communicate with their classmates and instructors electronically, whereas 64.9% of students were communicating online comfortably. Also, 82.20% of students were able to clear their doubt from teacher whenever required. Only 38 (20.5%) of students had equated online learning from home to conventional lectures in a lecture hall. However, 28.6% of students felt comfortable to learn from home in the pandemic era. Students (66.5%) wanted proper breaks, which would enable them to get sufficient time to think about the topic and frame their questions to clear their doubts. About 80% of students wanted that a sufficient number of questions should be asked to transform online learning sessions into interactive approaches. They highlighted distractions during online learning at home, problems of network accessibility, connectivity, lack of synchrony between audio and video, and audio disturbance.

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Conclusions: *More than half of our students prefer classroom learning because it facilitates better teacher–student interactions, stimulates understanding, provides a distraction-free environment, and permits an appropriate pace of learning, encouraging interactivity and independence from technology.*

Keywords: COVID-19 pandemic, online learning, undergraduate medical students, audio-video.

BACKGROUND AND JUSTIFICATION

The sudden outbreak of COVID-19 forced the closure of teaching institutes all over the world. All education-related activities requiring the physical presence of students and teaching staff were suspended and uncertainty persists over the possibility to resume the normal situation that existed before the COVID-19 pandemic in the near future. This was a more challenging situation for higher and technical education, which has no spare time cover syllabus. Almost all faculties accepted this challenge and were dealing with crisis by online teaching or e-learning. During the COVID-19 pandemic, the mode of clinical training given to students has changed to distance or online learning (1) based on video/recorded lectures, power point presentations and animations, which are deliverable either via the internet or offline mode and can be used alone or as a supplement to conventional teaching (2). There are advantages offered by the fact that ‘the current generation of learners are “digital natives” due to their presumed familiarity and reliance on information and communication technology’ (3). It can also improve the quality of higher education (4) and motivate learning.

Many were not prepared for online teaching but it is important to review the reasons for offering students online classes, which go beyond the periods of confinement. Medical education and clinical training have traditionally placed a greater focus on classroom instruction and bedside training, but in this changing scenario various e-learning tools have recently become popular among both teachers and students (5).

The present study was conducted on medical graduates of an Eastern state (Gujarat) of India. As per the apex regulator of medical education in India, the National Medical Council (NMC), it does not permit e-learning as main teaching learning methods for medical undergraduates,

while having a supplementary role only. MBBS curriculum is divided into three professional examinations over a four and a half year-period. In the first professional year, mainly non-clinical subjects such as anatomy, physiology and biochemistry are covered, and students do not get clinical exposure. In the second professional year, consisting of the third, fourth and fifth semesters (six month each), students get acquainted with paraclinical subjects, including pharmacology, pathology, microbiology and forensic medicine; they are also exposed to clinical teaching through rotatory posting in various outpatient and inpatient departments and community visits. The remaining two years, during which students continue to get clinical exposure, are allotted to clinical subjects (the third professional year). Students need to clear each summative assessment at the end of the professional year, and those who fail have the opportunity to come to the summative assessment after six months. They are kept in separate batch.

Our study was conducted on students attending the second professional year (third, fourth and fifth semesters), when both basic and clinical sciences are taught; however, after this, batch regulator has shifted to competency based medical education. One hundred fifty students are admitted to this institute each year. Medicine is the only science which addresses all three domains of learning: cognitive, psychomotor and affective. It is the science of reasoning but also a humanistic discipline that enables doctors to better understand their patients in order to offer them compassionate care. The present study was designed to find out students' perception regarding online teaching in the COVID-19 era. Positive results may offer a useful perspective on better learning modes, with negligible chance for spreading viral infection, and may also help us to find out which are the areas of deficiency and the most suitable interventions to improve learning. □

OBJECTIVES

- To assess student's opinion on online learning during the COVID-19 pandemic
- To compare students' satisfaction online in the time of COVID-19 versus large interactive lectures during the pre-COVID-19 era
- To find out which are the areas of deficiency and the most suitable ways to improve online teaching. □

METHODS

The present research was designed as a descriptive cross-sectional questionnaire-based study, with subjects being represented by all students attending 75% online lectures during the third, fourth and fifth semesters. For each participant, consent was taken using an online Google form, with maintaining confidentiality of information about individual students. Closed- and open-ended feedback questionnaires, which were prepared as per the relevant literature (1, 6, 7-10), have been suitably modified and validated by faculty members according to study requirements. These questionnaires were prepared to assess feasibility (question 1), suitability (questions 2 to 6), utility (questions 7 to 11) and effectiveness (questions 12 to 18) (Table 1). Recommendations and suggestions for online learning are summarised in Table 2. Feedback of close-ended questionnaires was collected using the five-point Likert scale: 1=strongly disagree, 2=disagree, 3=neutral (neither agree or disagree), 4=agree, 5=strongly agree. By including also open-ended question, we have allowed participants to give their suggestions and comments. Three sections were designed as follows: section I containing closed-ended questions, section II open-ended questions and section III demographic or information about students. Respondents' perceptions were collected through the online version of <https://docs.google.com/forms>.

The present study was started after obtaining permission from the institutional ethics committee of GMERS Medical College, Gotri, Vadodara, India. All responses to questionnaires and information about students would be kept in strict confidence and used only for research purposes.

Descriptive statistics mainly percentage was used to analyse students' perceptions and assess outcome on Microsoft excel. □

RESULTS

The study was conducted after two-month online teaching during the COVID-19 lockdown. A total of 185 undergraduate medical students participated, of which 135 were from the main batch (the fourth semester) and the remaining ones from two casual batches of the third and fifth semesters. The number of female respondents was greater than those of male respondents (58.8% vs 41.1%) as per batch demographic profile. Internet was accessible for 62.7% of undergraduate, whereas 11.4% of participants claimed some problems related to internet access and about 26% of students had a neutral opinion (Table 1).

Sixty seven percent of all participants were willing to actively communicate with their classmates and instructors electronically and 64.9% felt comfortable in online communication. Of all students, 82.20% were able to clear their doubts from teacher whenever required and 79.5% were getting quick response from their faculty members to solve doubts. Only 38 (20.5%) students of all 185 subjects had equated online learning from home to conventional lectures in a lecture hall; however, 28.6% of students felt comfortable to learn from home during the pandemic era, but 54.6% of them noticed disturbance during learning online at home. More than 75% (with 55.6% expressing disagreement and 21.6% a neutral opinion) did not support the statement "online lectures are more effective than traditional/live classroom lectures". Only 22.7% of medical students supported the continuation of online classes after the pandemic. Only 19.5% of all students agreed that online classes were boring, while 47% of respondents assumed a neutral position towards this question (see the results summarized in Table 1).

Of all students, 66.5% wanted proper breaks, so that they would get sufficient time to think about the topics and frame their questions to clear doubts. About 80% of respondents wanted that a sufficient number of questions or MCQ should be asked to transform online learning sessions into interactive approaches. More than half (51.9%) of students expressed their wish to have

SN	Questions	Disagree N (%)	Neither agree or disagree N (%)	Agree N (%)
Feasibility of online learning				
1.	I am able to easily access the Internet as needed for my studies	21 (11.4)	48 (25.9)	116 (62.7)
Suitability of online learning				
2.	I feel comfortable communicating online	17 (9.2)	48 (25.9)	120 (64.9)
3.	I am willing to actively communicate with my classmates and instructors electronically	15 (8.1)	46 (24.9)	124 (67.0)
4.	I feel comfortable to compose a text on a computer in an online learning environment	31 (16.8)	44 (23.8)	110 (59.5)
5.	I can ask my questions if there are problems in understanding an online lecture	09 (4.9)	24 (13.0)	152 (82.2)
6.	I get quick response from teacher for clearing my queries via online mode	06 (3.2)	28 (15.1)	147 (79.5)
Utility of online learning				
7.	I am more comfortable in online learning at home	80 (43.2)	52 (28.1)	53 (28.6)
8.	I am more comfortable in lecture in class	14 (7.6)	41 (22.2)	130 (70.3)
9.	Students are motivated due to online lectures	40 (21.6)	72 (38.9)	73 (39.5)
10.	Sufficient number questions or MCQ are asked by the teacher to make online learning session interactive	07 (3.8)	32 (17.3)	146 (78.9)
11.	More questions can be asked in online learning	25 (13.5)	66 (35.7)	94 (50.8)
Effectiveness of online learning				
12.	Learning is similar in online or conventional lectures in lecture halls	97 (52.4)	50 (27.0)	38 (20.5)
13.	Online classes are boring	62 (33.5)	87 (47.0)	36 (19.5)
14.	It simply takes more time to effectively accomplish tasks in an online environment than a face-to-face class	44 (23.8)	56 (30.3)	85 (45.9)
15.	I prefer to attend online lectures than conventional lectures after the COVID-19 pandemic is over	92 (49.7)	49 (26.5)	44 (23.8)
16.	I get quick response from teacher for clearing my queries via online mode	06 (3.2)	28 (15.1)	147 (79.5)
17.	Online classes are boring	62 (33.5)	87 (47.0)	36 (19.5)
18.	Online lectures are more effective than traditional/live classroom lectures	103 (55.7)	40 (21.6)	42 (22.7)

TABLE 1. Students' perception on online learning

regular online assessment but divided opinion on practical teaching by online opinion (see data summarized in Table 2).

Students' answers to open-ended questions (Table 3) highlighted several problems related to online teaching, including less student-faculty interaction, impossibility to achieve in-depth learning or understanding, poor suitability for practical classes, increased boredom and monotony in

a shorter span of time and less effectiveness than classroom teaching. Irritation due to constant online teaching/learning and faster pace of lecture delivery generating more stress among students have been also revealed by students' answers. Other inconvenients included distractions during online learning at home, problems of network accessibility, connectivity, lack of syn-

SN	Questions	Disagree N (%)	Neither agree nor disagree N (%)	Agree N (%)
1.	During online sessions, give proper breaks, so that the students should have sufficient time not only to think about the topic but also to frame their questions on doubt	13 (7.0)	49 (26.5)	123 (66.5)
2.	Online class for pharmacology practical should be started	60 (32.4)	54 (29.2)	71 (38.4)
3.	Online assessment should be done regularly	21 (11.4)	68 (36.8)	96 (51.9)

TABLE 2. Problem and suggestion about online learning

TABLE 3. Students' opinion about problems with online class

Problems with online teaching
Less student-faculty interaction
Deep learning and understanding not possible in online practical classes
Boring and monotonous in a shorter span of time
Less effective than classroom teaching
Irritation due to constant online teaching and reading
Cheating in online assessment
Faster teaching speed
Irritation due to constant online teaching and reading
Stressful
Distractions in online teaching
Use of background app
Family members
Lack of classroom environment
Home environment
Network related issues
Connectivity
Accessibility
Lack of synchrony between audio and video
Audio disturbances
Others
Problems with free online teaching platforms
Electricity

TABLE 4. Suggestions for online teaching

Online teaching
Brief summary at the end of the class
MCQs or mini tests at the end of the class
More interactive lectures
More time to ask questions in chat box
Slowly cover the topics
Offline practical classes only
Others
Coordination with other departments for the timings of lectures
Offline exam only
Start offline classes and practical after the pandemic is over

chrony between audio and video, and audio disturbance

Medical undergraduates had suggested some solutions to make online learning effective (Table 4), including a brief summary at the end of each class, MCQs or mini tests at the end of the class and more time given to students for asking questions in chat box. The pace of delivery of interactive lectures should slow and co-ordination with other departments should be done to make learning more effective.

Our research has also some limitations, because it is a simple, descriptive study with a relatively small sample, involving only students who attend three semesters. Therefore, different results may be obtained if the sample size will be extended to include students attending all semesters. □

DISCUSSION

COVID-19 has helped in transforming pedagogy by eliminating conventional teaching methods with more innovative, technology driven, team facilitated and self-directed learning. It could go a long way in having a blended approach promoting an individualized and inter-professional approach, which has aroused the interest of medical educationist for more than a decade (12, 13). To know the students' opinion on online learning during the time of COVID-19, our study was conducted on undergraduate students of GMERS Medical College, Gotri, Vadodara, India, who were attending the second professional year. Given that all students have participated in the study, the response rate was 100%, similarly to a study from Saudi (14). In our study, 62.7% of respondents stated they had optimal internet access for learning purposes, which was similar to students from King Saudi University, where 62% of physical therapy students agreed that social media was important to support their learning (14). Also, about 65% of students comfortably communicate by using a e-learning platform. In our study, there were more female than male participants (58.8% vs 41.1%), similarly to a survey conducted among Polish medical students, with the number of male participants was smaller than that of female participants (29% vs 71%) in online learning (15). Out of all 185 undergraduates, only 38 (20.5%) students equated online learning from home to conventional lectures in a lecture hall, but 28.6% of students felt comfortable to learn from home during the pandemic era and 22.7% of them wanted that online approach should be continued even after the end of the pandemic era. This was approximately similarly to a survey conducted by the Medical College of Pakistan, where 23% of participants had a positive perception of online teaching (16), but in contrast to another study conducted in the University of Tasmania, according to which 95% of students had a favourable opinion about online teaching and 75% thought it was effective in increasing their skills (17). Although students preferred online learning to a lesser extent, more than 82% of them believed it was useful to solve their doubt. This is a very satisfactory and encouraging positive finding. About two thirds of students wanted proper breaks to get sufficient time not only to think

about the topics but also to frame adequate questions to clear their doubt. It also prevents online fatigue. The Council of Indian School Certificate Examination (CICSE) has also suggested that online class could not have a duration longer than 30-45 minutes. Medical undergraduates also wanted a break between two successive lectures. Students pointed to problems related to online lectures and gave some suggestion to make learning more effective, including a brief summary, MCQs or mini tests at the end of the class, a longer time for asking questions in chat box; another suggestion was that the pace of delivery of interactive lecture should slow and co-ordination with other departments should be established. □

CONCLUSIONS

The e-learning mode has been adopted by several medical, technical and non-technical

education institutes during the COVID-19 crisis worldwide. Although it has changed the way of learning and accessing education, more than half of our students showed their preference for traditional learning. The main reason for this is that it facilitates better teacher–student interactions, stimulates understanding, provides a distraction-free environment, encourages interactivity and independence from technology, permits a better co-ordination between different departments and is more convenient for all groups of students. □

Conflicts of interest: none declared.

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