

COVID-19 and Its Impact on Undergraduate Students in an Indian Medical Institute: Learning Is in Full Swing

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ABSTRACT

Background: The emergence of COVID-19 pandemic posed a serious challenge to undergraduate medical education. With the principles of social distancing in place, all classroom sessions had to be suspended during the lockdown. Therefore, tele-teaching was planned and live online classes were regularly held for all undergraduate medical students at our institute. This study was conducted to gather the students' perception of tele-teaching through live online classes.

Methods: The present descriptive cross-sectional study enrolled 680 undergraduate students in Sawai Man Singh Medical College, Jaipur, India. It was conducted after two months of regular live tele-teaching during April-May 2020, immediately after the lockdown was announced. The classes were held through video conference platform, Cisco WebEx software, for all medical undergraduates at our institute. Two sessions were held every day for each of the four batches of Bachelor of Medicine and Bachelor of Surgery (MBBS). The students' perception was collected at the end of two months of such teaching, through a pre-validated open-ended questionnaire using google form platform.

Result: Majority of students [n=493, (72.5%)] found the online classes beneficial and were satisfied with the content and relevance of the courses delivered. The most common challenges were internet connectivity issues and limited interaction with the faculty, yet the students' general perceptions reflect that they have benefitted from these online classes during the pandemic period and want them to continue even after the lockdown.

Conclusion: This study described the undergraduate medical students' response to the live online classes and the encountered challenges. It concluded that this endeavour was a welcome note for the students as well as the medical teachers, in the time of COVID-19 pandemic, when all undergraduate teaching/learning had come to a standstill.

Keywords: COVID-19 pandemic, Medical education, Online classes, Tele-teaching, Undergraduate learning

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Introduction

The World Health Organization (WHO) declared the coronavirus disease (COVID-19) as a pandemic on 11th March 2020 (1). The pandemic spread rapidly across the globe, toppled the existing medical education systems and shifted the focus of medical colleges towards care for patients and communities entirely instead of teaching the students, who are trained to be the future physicians (2).

Being the most effective means of stemming the coronavirus outbreak, social distancing disallows students from gathering in lecture halls or small group rooms (3). Therefore, with the principles of social distancing in place, all classroom teaching for these students had to be suspended during the lockdown (4). Hence, medical colleges across the country suspended all in-person courses to avoid further spread of the pandemic.

Over the past few years some colleges have been more frequently engaged in using online or electronic learning as an add-on to the traditional forms of lecture-based classroom learning (5). Nevertheless, in almost all medical schools of the country, students are more inclined to convene in physical settings (3). However, in current circumstances where classroom teaching is practically impossible, online classes have emerged as the only viable solution for teaching MBBS students.

Accordingly, in response to the pandemic, most medical schools across the world have shifted to online delivery of curriculum through various virtual platforms (4, 6, 7). This unprecedented shift in teaching methodology has posed a serious challenge to medical teachers as well as students who are used to traditional classroom teaching/learning.

Although a massive body of information is available on the internet for students to practice self-learning, online teaching is generally viewed as a better solution in light of its outcomes. Also, there is uncertainty regarding how long the pandemic situation will persist. COVID-19 may represent an enduring period that could bring about

lasting transformations in medical education. Keeping this in mind, a regular schedule of live online lectures was planned and executed for all 1000 students of MBBS at one of the largest government medical colleges of India. This study was conducted to gather the students' perceptions of live online teaching/learning and the challenges they face after two months of holding the classes during the lockdown.

The central research question in this study was whether the live online teaching/learning is beneficial to the undergraduate students.

Materials and Methods

This cross-sectional descriptive study was done at one of the largest public sector medical colleges of India, which presently hosts around 1000 undergraduate students at different stages of the four-year MBBS program. The sample size for this study was calculated using the formula for cross-sectional studies – $N=4pq/L_2$, assuming $p=50$; and adding 10% nonresponse rate. The minimum sample size was calculated to be 500. Out of the 1000 undergraduate students of the institute, all those who gave consent to participate and completed the questionnaire were included in the study. Those who changed their minds in the course of the study or did not complete the questionnaire were excluded, and thus 680 medical students were selected based on convenience sampling method.

Study Design

First, virtual classes were organised centrally at Sawai Man Singh Medical College, with a properly organised schedule and not at the sole discretion of the faculty. This ensured quality assurance of internet connectivity, audio-visual quality and time management. This also helped with maintaining the decorum of academic settings and timetables for the students as well as faculty.

In April 2020, immediately after the lockdown was announced by the government, the live online lectures were simultaneously

launched through video conferencing for all the four batches of MBBS. The program was specially designed to cater to the requirements of undergraduate teaching during the lockdown following the outbreak.

The timetable for all four batches was planned and everyday each batch was subjected to two live lectures across their subjects of study. The institute faculty were sensitized to the modus operandi of online teaching and using the software prior to the launch of these classes. Two video conferencing relay stations were set up in a designated area and live online classes were taken by the faculty for all four years of MBBS, namely I MBBS, II MBBS, Pre-final MBBS and Final MBBS. This was monitored centrally and carried out using the Cisco WebEx software, which was provided by the State Government to the institute. This software allowed the students to join meetings using a login ID and password, and then the teachers held live lectures by explaining their topics via PowerPoint presentations and online whiteboard during the video conferencing. The students were able to ask questions and clear doubts during and at the end of each session. Then at the end of each topic they were given a multiple choice test (online) and were asked to submit it via google form.

Data Collection Tools

Two months into the program, the students' perceptions of the online classes were collected via a pre-validated feedback questionnaire.

This semi-structured questionnaire, which included both closed and open-ended questions, was designed using the Google Form platform and consisted of questions pertaining to learner understanding of online classes, and their benefits and challenges. The questionnaire was shared with the students via the WhatsApp groups of their respective batches. Prior to distribution, the face and content validity of the questionnaire was confirmed by an expert panel of four faculty members from the medical education unit of

the institute. The students were given a day to complete the questionnaire. Responses exceeding the minimum sample size were also analysed.

This was the first learning experience for both teachers and students from a developing country with limited resources, where a systematically scheduled, centrally controlled online teaching program was administered at one of the country's largest government sector medical colleges, although the faculty had previous experience of attending online webinars. Precautionary measures surrounding the pandemic circumstances were fully in place throughout the program.

Ethical Considerations

This research was approved by Sawai Man Singh Medical college. The study objectives were explained to the participants and written informed consent was obtained from them. To observe ethical principles, the students were assured of their voluntary participation and were given the right to withdraw at any time.

Data Analysis

The data were analysed using the Google Form summary analysis and descriptive statistics were conducted using Microsoft Excel. The results were presented in percentage and proportion as discussed below.

Results

A total of 680 out of 1000 undergraduate medical students at our institute participated in the present study. It was ensured that the participants adequately represented the students from all four years of MBBS program. Out of these 680 students, 209 belonged to I MBBS. There were 182 students of II MBBS, 161 students of final MBBS (Part 1) and 128 students of Final MBBS (Part 2). Most of the students [n=355 (52.2%)] attended more than 100 classes, while 249 (36.6%) students attended 50 to 100 classes and less than 50 classes were attended by only 76 (11.2%) students, over a period of two months.

Figure 1 shows the participants'

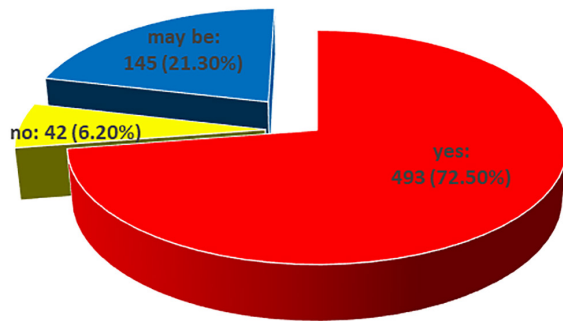


Figure 1. Perception of students - Were online classes beneficial?

perceptions of the online teaching program. The research question stating that the online classes were beneficial to the students was proved in this study. It was observed that majority of the students [n=493 (72.5%)] felt that these online classes were beneficial to them while 145 (21.3%) students were not sure and only 42 (6.2%) did not feel that the online classes were beneficial.

Figure 2 depicts the students' perception of the content delivered, relevance to the curriculum and clarification of the concepts during the online classes. Majority of the students [n=553(81.3%)] were satisfied

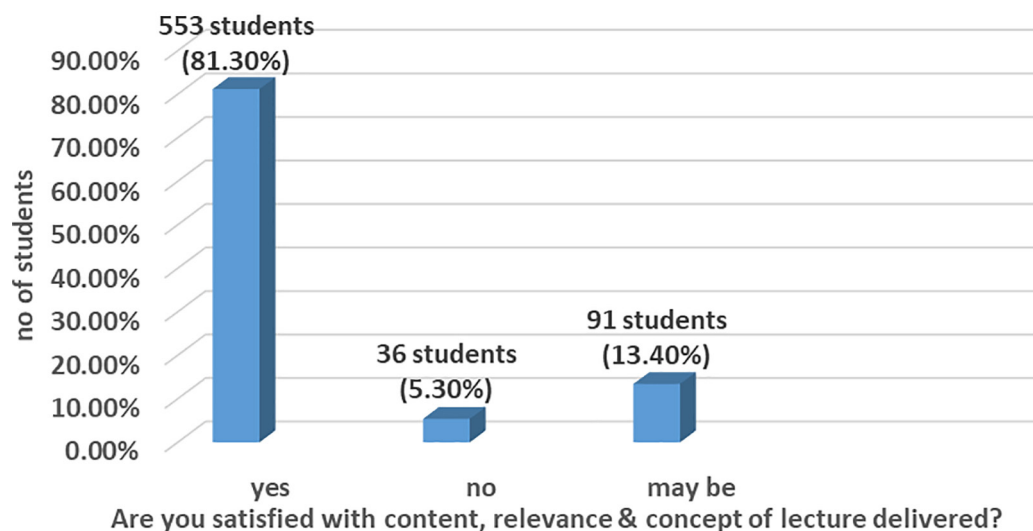


Figure 2. Student satisfaction about content, relevance and concept of lecture delivered

with the content delivered by the teacher. They perceived that the provided content was relevant to their learning needs and understood the concepts well through the online classes.

Table 1 describes the diverse advantages of online classes, as expressed by the students in the form of multiple responses. The advantages included the comfort in attending the classes [n=386 (56.8%)], avoidance of distraction by fellow students [n=310 (45.5%)], use of modern technology [n=217 (31.9%)] and automatic attendance [n=198 (29.1%)].

These classes were accepted on such a positive note that more than half of the students asked for the online classes to continue even after the college is reopened.

The major limitations of these classes, as pointed out by the students, are depicted in Table 2. The most common challenges facing the students and hindering their progress, were slow internet connection during the classes (44.6%), relatively restricted interaction with the faculty (27.5%), strain on eyes (11.9%) and lack of practical sessions and clinical cases (16.0%). These

Table 1. Advantages of online classes (Multiple responses)

s. no	Parameter	No of students	Percentage of students
1	Comfort of attending the class	386	56.80%
2	Less disturbance by other students	310	45.50%
3	Use of modern technology	217	31.90%
4	Automatic attendance	198	29.10%

Table 2. Challenges and limitations of online classes

s. no	Parameter	No of students	Percentage of students
1	Poor internet connectivity	303	44.60%
2	Limited interaction with faculty	187	27.50%
3	Stress and strain on eyes	81	11.90%
4	Lack of practical sessions and clinical cases	109	16.00%
Total		680	100.00%

shortcomings were gradually overcome, especially following the adoption of an updated version of the software, which created a better opportunity for interaction.

In the open comments, almost all the students wanted the recorded content of these sessions to be shared with them for revision and better understanding. Also, all participants responded that these online classes were a welcome change in times of COVID-19 pandemic and lockdown, and most importantly learning remained uninterrupted.

Discussion

The COVID-19 made us realise the importance of online classes as a substitute for regular classrooms, in times of calamity. In the absence of this venture, majority of medical colleges would have stopped their educational activities in this period.

The innovation of these online classes was received by the undergraduate medical students as a welcome change and a break from the monotony of traditional programs while maintaining their routine studies. It also gave them a pathway to restart their college schedule.

Our study shows that 72.5% of students have taken these online classes on a positive note, thereby favouring similar enterprises in the future. The authors did not find any literature pertaining to the views of undergraduate students in India about systematic live online learning during the coronavirus crisis. However, in their study about postgraduate students of paediatrics and their perceptions of online classes, Agarwal et al. have described similar findings in terms of student satisfaction (8). Also, Rajab et al. concluded their study by pointing to the positive impact of the COVID-19 pandemic

on online medical education (9).

In terms of challenges, the most outstanding ones in our study included internet connectivity issues, stress and lack of interaction with teachers. Rajab et al. have encountered similar challenges in their study (9). Agarwal et al. have also described similar limitations of technology and limited interaction with students in their initial phase of study, but have still concluded that online classes should be integrated into postgraduate medical curriculum (8). Arora et al. in their study on perceptions of teachers from higher education centres, also pointed out similar drawbacks but advocated these online classes as an efficient means of continuing the learning process in times of crisis (10). Some experts believe that in most other medical and nonmedical institutions, online classes are being organised at the discretion of individual teachers and students rather than through centralised efforts, which increases the challenges faced for smooth execution and quality assurance (8, 9).

Nevertheless, in such classes the importance of maintaining a student-centered approach with doubt clearing sessions, creative conceptualization and interdepartmental coordination cannot be undermined (11, 12). The fact that technology has enabled millions of students to keep learning even when direct contact is impossible is in itself a fascinating development. However, a physical classroom environment and interaction has generally been perceived as the best teaching-learning approach (7). Therefore, we can safely claim that online learning cannot be seen as a threat to the traditional models of in-person learning.

Hence, in spite of all limitations, these online courses do still appear to be a

promising solution to the challenges of learning in these paralyzing times. Our attempt towards continuing learning in these adverse circumstances was well appreciated by our students, as also stated in other studies (6, 7, 9). We have also expanded the horizon by devising assessment strategies, within limitations, for our students.

Our study illustrated medical students' perception of online teaching-learning sessions. We concluded that these online classes were an easy, feasible and cheap alternative to the in-person teaching of undergraduates during the COVID-19 pandemic. This was in spite of the limitations and challenges faced in the implementation of the program. Online sessions can also be held in future as an adjunct to offline classes, for the benefit of the students.

Since it is not clear how long the current health crisis will persist, the need to train the future doctors should be addressed along with patient care. The initiative to set up online classes in a public sector medical college of a developing country is a small but vital contribution towards continuous training and preparation of these future doctors. We also hope that this experience will help us prepare for emergency situations in possible future crises. Time is yet to tell whether online teaching-learning will become the mainstream teaching method in the long run or not.

To the best of our knowledge, our study is the first of its kind in India to deal with the stated innovation in undergraduate medical education during the COVID-19 pandemic.

Ethical Declarations

After introducing themselves, the researchers explained the objectives of the study and the need to implement them to the undergraduate students and the written consent was obtained from all those participating in the study. The participants were also assured that all information collected will remain confidential. This study was approved by the Sawai Man Singh Medical College, Jaipur, India.

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Conflict of Interest

The authors declare that they have no conflict of interests.

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Authors' Contributions

M.J. devised the study concept. SH.B. designed the study, collected data, ran the study intervention, performed the analyses, drafted and revised the manuscript. M.G. and D.P. contributed to the design and analysis of the study data. A.M., I.D.G. and SU.B. participated in the coordination of the study and critically revised the manuscript.

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