

# Perception of Undergraduate Dental Students toward Online Lectures during COVID-19 Lockdown Period

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## ABSTRACT

**Aim and objective:** The study aimed to assess the perception of undergraduate dental students toward online lectures during the coronavirus disease-2019 (COVID-19) lockdown period.

**Materials and methods:** A questionnaire using a 3-point Likert scale was distributed to 400 undergraduate dental students of a dental institute. The survey form distribution and data collection were done using Google Forms. The data were entered into an excel spreadsheet and analyzed using SPSS version 15. Chi-square test and Fischer's exact test were applied to know the association of perception of undergraduate dental students toward online lectures with gender and their year of course.

**Results:** A total of 356 students responded to the survey with a response rate of 89%. While the majority of students (77.8%) had a good experience in understanding online lectures, only 18% of students found online lectures to be more impactful than classroom lectures. Also, a statistically significant difference was found among students in a different year of the course ( $p = 0.04$ ). Approximately 49% of the students with a higher number of males (69.6%) as compared to females (43.9%) felt that online lectures needed further improvement to support their learning ( $p = 0.001$ ). While 58% of students preferred the inclusion of online lectures in future dental education, 76.4% of students said that they would prefer a combination of both online lectures and classroom lectures.

**Conclusion:** Students had a positive response toward online lectures. However, based on the results, it can be concluded that the e-learning system needs further improvement to support students' learning and it can only be considered as an adjunct to traditional classroom lectures.

**Clinical significance:** The concept of online teaching was explored globally in view of the pandemic of COVID-19. The use of online lectures, webinars, and continuing dental education was very helpful and informative for dental students. The curriculum and teaching were possible even in lockdown, maintaining social distancing. Thus, this study helps to find out the perception and understanding of dental students toward online lectures and teaching during the COVID-19 pandemic.

**Keywords:** Coronavirus disease-2019, Dental education, Online teaching, Perception, Undergraduate students.

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## INTRODUCTION

In the historical background, the whole world and India has experienced many epidemics and pandemics. Cholera pandemic (1817, 1829, 1852, 1863, 1881, 1899), Mumbai plague epidemic (1896), influenza (Spanish flu) pandemic (1918), polio epidemic (1970-1990), smallpox epidemic (1974), dengue epidemic (2003), meningococcal meningitis epidemic (2005), chikungunya outbreak (2006), H1N1 flu pandemic (2009), and Nipah outbreak (2018) are some of notable epidemics and pandemics.<sup>1</sup> Most recently, India has encountered a viral pandemic disease called novel coronavirus disease-2019 (COVID-19) which is caused by the SARS-CoV-2 virus.<sup>2</sup>

The most common symptoms associated with COVID-19 are fever, fatigue, dry cough, myalgia, and dyspnea. Other symptoms include pharyngeal pain, dizziness, abdominal pain, and anorexia, which are most likely presented by patients with severe illnesses.<sup>3</sup> The route of transmission of SARS-CoV-2 is through respiratory droplets or by contact. Therefore, if an infected person coughs or sneezes within close contact (radius of approximately 6 feet), SARS-CoV-2 can potentially be transmitted. Transmission may also occur through fomites in the immediate environment around the infected person.<sup>4</sup> This led to the recent recommendation of social distancing to minimize community spread of the disease.<sup>5</sup>

In addition to growing implications on health and healthcare facilities, COVID-19 is having a serious impact on the economy, lifestyle, cultural heritage, science, and education. As we get

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updates about the spread of COVID-19 from all over the world through television and social media, this can be considered a difficult time for all of us. The novel pandemic of COVID-19 has caused a lot of anxiety and fear in the minds of the people. In view of these considerations to stop the spread of the pandemic, the Government of India (GOI) announced the countrywide closure of all educational institutions on March 16, 2020. This was followed by a nationwide lockdown on March 23, 2020. These educational institutions include primary, secondary, tertiary, and

professional institutions (medical, dental, pharmacy, engineering, and management studies).

The rationale behind nationwide lockdown was to control community transmission of COVID-19. Cauchemez et al. stated that school closure is a nonpharmaceutical intervention that is commonly suggested for mitigating influenza pandemics.<sup>6</sup> Based on this philosophy, closure of educational institutions was implemented to delay the transmission of COVID-19.

This nationwide closure of educational institutions is impacting almost 70% of the world's student population. United Nations Educational, Scientific and Cultural Organization (UNESCO) is supporting countries including India in their efforts to alleviate the immediate impact of the lockdown period on the educational sector and to facilitate the continuity of education for all through remote learning or online education.<sup>7</sup>

In response to the COVID-19 scare and with UNESCO's recommendation, many dental colleges in India have moved to online education to facilitate continuity in dental education during this nationwide lockdown period. Therefore, the study aimed to determine undergraduate dental students' perception toward online lectures during the current COVID-19 lockdown period.

## MATERIALS AND METHODS

The descriptive cross-sectional study was designed to evaluate dental students' perception of an online lecture. Ethical approval for the survey was obtained from Institutional Review Board Ethics Committee (Reference no: TDC\_EC/18/2020).

The survey was conducted in a dental institute in Navi Mumbai, India. The period of the survey was from May 18 to May 25, 2020. A total of 400 undergraduate students from a dental institute who were attending online lectures during the COVID-19 lockdown period were considered for this survey.

A pilot trial of the survey was conducted for validation of the questionnaire before uploading it on Google Forms application. The participants had experienced online lectures before the survey, and the duration of online lectures was considered during the pilot trial of the survey. It was carried out by distributing the questionnaire to 20 undergraduate students and 10 faculty experts to check the appropriateness of the questionnaire. It was found that the questions were unambiguous, clear, and easy to respond to. Validation of questionnaire was also done with the help of previously published research article related to our survey.<sup>8-10</sup>

Our study participants consisted of undergraduate dental students from the first year, second year, third year, and final year of a dental institute. A close-ended questionnaire was formulated in English by the researchers based on previous research studies and consisted of two parts. The first part included the consent for participation in the study, the year of the course, and the gender of the participant. The second part of the questionnaire consisted of a total of 14 questions, which were focused on student's perception of online lectures. The survey form distribution and data collection were done by using Google Forms, which is a survey administration application developed by Google (Google LLC, California, USA).

In response to each question, the following scoring for three-point Likert scale was used:

(1) Yes, (2) No, (3) Uncertain.

The data were entered into an excel spreadsheet and analyzed using SPSS version 15 (SPSS Inc., Chicago, IL, USA). The descriptive statistics were used to describe the perception of undergraduate dental students toward online lectures. Chi-square test and Fischer's

exact test were applied to know the association of perception of undergraduate dental students toward online lectures with gender and their year of course. The confidence level and level of significance were fixed at 95 and 5%, respectively.

## RESULTS

In a total of 400 undergraduate dental students, 356 (89%) responded to this online survey. All the respondents consented to participate in the study. Out of 356, 287 were female and 69 were male students. A total of 103 students from the first year, 86 students from the second year, 83 students from the third year, and 84 students from the final year participated in the study.

Table 1 depicts the perception of undergraduate dental students toward online lectures. Tables 2 and 3 depict an association of students' perception with the year of the course and gender, respectively.

Most of the students (98.9%) had either a computer or laptop (Question 1) which can be used to access online lectures. Many of the respondents (92.1%) had mobile data or WiFi connection (Question 2) using which they could access online lectures (Table 1).

Almost all the students (98.3%), irrespective of their year of course or gender knew how to access online lectures (Question 3). When asked about the user-friendliness of the application used for online lectures (Question 4), 86.2% of the students gave a positive response. More female students (90.9%) as compared to males (66.7%) found the application to be user-friendly with the results being statistically significant ( $p$  value = 0.001).

While the majority of the students (77.8%) had a good experience in understanding online lectures (Question 5), approximately 15% of the students were uncertain about the same. A statistically significant difference ( $p$  = 0.001) was seen with a higher number of female students (82.6) reporting that they had a good experience in understanding online lectures as compared to males (58%). Eighty-seven percent of students had an opinion that online lectures with PowerPoint presentations were helpful to their learning (Question 6). More females (90.2%) as compared to male students (73.9%) responded positively to this question ( $p$  = 0.001).

Only 18% of the students found online lectures to be more impactful than classroom lectures (Question 7). A statistically significant difference was found among students in a different year of the course ( $p$  = 0.04) with the majority of positive responses seen with final-year students (25%) followed by first-year students (22.3%), second-year students (15.1%), and third-year students (12%) (Table 2). Also, the difference in opinion according to gender was statistically significant ( $p$  = 0.01) with 71% males responding negatively and 28% females being uncertain about their response (Table 3).

Most of the first- and second-year students (around 88%) were comfortable with the timetable schedule for online lectures (Question 8). On the other hand, only 49.4% of third-year students and 61.9% of final-year students had a similar opinion ( $p$  value = 0.001). Also, females (76.3%) were more comfortable as compared to male students (58%) ( $p$  value = 0.001).

Approximately 49% of the students with a higher number of males (69.6%) as compared to females (43.9%) felt that online lectures needed further improvement to support their learning (Question 9). Hence, a significant statistical difference was found among male and female respondents ( $p$  value = 0.001).

When asked about distraction during online lectures as compared to classroom lectures (Question 10), the response was

**Table 1:** Frequency distribution of perception of undergraduate dental students toward online lectures (number of respondents—356, Navi Mumbai, India, 2020)

Question	Yes (%)	No (%)	Uncertain (%)
1. I have a computer/ laptop/mobile	98.9	1.1	0
2. I use WiFi or mobile data or both	92.1	1.7	6.2
3. I know how to access online lectures	98.3	0.6	1.1
4. The application used for online lectures is user-friendly	86.2	7.9	5.9
5. I am having a good experience in understanding online lectures	77.8	7.0	15.2
6. Online lectures with PowerPoint presentations are helpful to my learning	87.1	4.5	8.4
7. Online lectures are more impactful than classroom lectures	18.8	56.5	24.7
8. I am comfortable with the timetable schedule for online lectures	72.6	16.0	11.2
9. Online lectures need further improvement to support my learning	48.9	28.7	22.5
10. I often get distracted during online lectures as compared to classroom lectures	48.0	36.8	15.2
11. I know how to capture screenshots of slides during online lectures	97.2	1.4	1.4
12. I know how to record online lectures	49.2	44.1	6.7
13. There should be the inclusion of online lectures in future dental education	58.4	20.2	21.3
14. I prefer combination of both online lectures and classroom lectures	76.4	16.3	7.3

highest for final-year students (61.9%) and the least for first-year students (34%) with the difference being statistically significant ( $p$  value = 0.001).

Although the majority of the students (97.2%) knew how to capture screenshots of slides during online lectures (Question 11), only 49.2% of students knew how to record online lectures (Question 12).

Around half of the students (58.4%) preferred the inclusion of online lectures in future dental education (Question 13). In this, 61.3% were female students and 46.4% were male students, and a statistically significant difference was seen with the same ( $p$  = 0.036).

76.4% of students said that they would prefer a combination of both online lectures and classroom lectures (Question 14).

**Table 2:** Association of the year of course with a perception of undergraduate dental students toward online lectures (number of respondents—356, Navi Mumbai, India, 2020)

Question no.	Yes				No				Uncertain				Chi-square value	p value
	First year	Second year	Third year	Fourth year	First year	Second year	Third year	Fourth year	First year	Second year	Third year	Fourth year		
1	99.0	100	98.8	97.6	1.0	0	1.2	2.4	0	0	0	0	2.199	0.53
2	94.2	90.7	89.2	79	1	0	3.6	2.4	4.9	9.3	7.2	3.6	6.737	0.35
3	99	97.7	96.4	100	1	0	1.2	0	0	2.3	2.4	0	6.366	0.38
4	92.2	82.6	88.0	81.0	4.9	9.3	7.2	10.7	2.9	8.1	4.8	8.3	6.484	0.37
5	82.5	72.1	74.7	81.0	7.8	7.0	6.0	7.1	9.7	20.9	19.3	11.9	6.486	0.37
6	91.3	87.2	88.0	81.0	2.9	2.3	4.8	8.3	5.8	10.5	7.2	10.7	6.738	0.35
7	22.3	15.1	12.0	25	53.4	50.0	66.3	57.1	24.3	34.9	21.7	17.9	12.767	0.04*
8	88.3	87.2	49.4	61.9	5.8	9.3	24.1	27.4	5.8	3.5	26.5	10.7	57.282	0.001*
9	49.5	51.2	53.0	41.7	34.0	17.4	28.9	33.3	16.5	31.4	18.1	25.0	12.355	0.06
10	34.0	41.9	57.8	61.9	50.5	36.0	31.3	26.2	15.5	22.1	10.8	11.9	22.783	0.001*
11	97.1	97.7	97.6	96.4	2.9	1.2	0	1.2	0	1.2	2.4	2.4	5.555	0.48
12	52.4	44.2	42.2	57.1	39.8	46.5	50.6	40.5	7.8	9.3	7.2	2.4	7.556	0.27
13	53.4	60.5	62.7	58.3	24.3	16.3	14.5	25	22.3	23.3	22.9	16.7	5.717	0.46
14	77.7	75.6	83.1	69.0	17.5	11.6	9.6	26.2	4.9	12.8	7.2	4.8	14.795	0.02*

\*Significant  $p$  value ( $p < 0.05$ )



**Table 3:** Association of gender with a perception of undergraduate dental students toward online lectures (number of respondents—356, Navi Mumbai, India, 2020)

Question no.	Yes (%)		No (%)		Uncertain (%)		Chi-square value	p value
	Male	Female	Male	Female	Male	Female		
1	94.2	100	5.8	0	0	0	16.827	0.001*
2	88.4	93	5.8	0.7	5.8	6.3	8.735	0.013*
3	94.2	99.3	2.9	0	2.9	0.7	10.866	0.004*
4	66.7	90.9	20.3	4.9	13	4.2	28.006	0.001*
5	58	82.6	15.9	4.9	26.1	12.5	20.752	0.001*
6	73.9	90.2	13.0	2.4	13.0	7.3	17.787	0.001*
7	17.4	19.2	71.0	53.0	11.6	27.9	9.268	0.01*
8	58.0	76.3	30.4	12.5	11.6	11.1	13.701	0.001*
9	69.6	43.9	15.9	31.7	14.5	24.4	14.746	0.001*
10	58.0	45.6	26.1	39.4	15.9	15.0	4.462	0.107
11	95.7	97.6	1.4	1.4	2.9	1.0	1.382	0.501
12	52.2	48.4	42	44.6	5.8	7.0	0.355	0.837
13	46.4	61.3	30.4	17.8	23.2	20.9	6.674	0.036*
14	66.7	78.7	26.1	13.9	7.2	7.3	6.103	0.047*

\*Significant *p* value (*p* < 0.05)

Maximum positive responses were seen with students from the third-year (83.1%) followed by first-year (77.7%), second-year (75.6%), and final-year (69%), respectively. The difference in the opinions was found to be statistically significant (*p* = 0.02).

## DISCUSSION

The natural catastrophe of the COVID-19 pandemic is having an intense effect on millions and trillions of people around the world. The impact of the COVID-19 crisis has brought the whole world to a standstill. Each sector suffered a significant impact because of this pandemic. Many of the developed and developing countries around the world have imposed a lockdown to contain the spread of COVID-19. Recently imposed lockdown and rules associated with it have forced everyone to quickly adopt different ways of working, learning, and connecting. This can be termed as the "New Normal" for the current situation.

One new adoption of a different way of working and learning in the education sector is "Online learning". In response to the education minister's (GOI) recommendation, many dental colleges, primary schools, other professional schools, and colleges opted for online teaching. This was also supported by UNESCO's recommendation for online teaching.<sup>11</sup>

To abide by the norms of social distancing, both the lecturers and students are expected to stay home and yet carry out their duties. Thus, online or e-learning systems have replaced the traditional face to face classroom method during this lockdown period.<sup>12</sup>

The present study was carried out to determine students' perception toward online lectures amidst the current lockdown period due to the COVID-19 crisis. The 3-point Likert scale was preferred for evaluation of students' perception in our study, which was in accordance with a study conducted by AlHamdan et al.<sup>13</sup> Many other rating scales use 2, 3, 5, and 7 points which are equally reliable and efficient. In our study, we were interested in learning the students' perceptions or attitudes rather than the intensity of their beliefs. AlHamdan et al. in their survey also stated that a questionnaire using a 3-point scale can be finished faster than

scales with more points, which helps in preventing responders from making random choices, thus avoiding contradictory opinions.<sup>13</sup>

In the present study, the majority of students (98.9%) had a computer or other devices to access online lectures and they also had adequate internet networks to access online lectures. Similar results were also seen in the survey by Asiry.<sup>9</sup> Selim stated that student before any information technology experience, such as, having a computer or any device at home and attitude toward e-learning is critical to e-learning success.<sup>14</sup>

In the present study, most of the students gave positive responses to question related to the user-friendliness of the application used for online lectures and many of the respondents knew how to access online lectures. In favor of students' perspective, ease in the use of software applications to access online lectures was considered as the most critical factor. FitzPatrick also stated that efficient online learning requires suitable hardware and software in addition to user-friendly navigation tools.<sup>15</sup> However, the results from the study by Linjawi and Alfadda were not in the support of results from the present study.<sup>16</sup> The results from a study by Alsuraihi et al. were also contradictory to the results of the present study.<sup>17</sup> Alsuraihi et al. found that the language barrier was an important issue faced by the participants in using online tools for learning purposes.<sup>17</sup> Some of the known applications used for online learning are iTunes U (Apple Inc., United States), Zoom (Zoom Video Communications, United States), Google Classroom (Google LLC, United States), Coursera (Coursera Inc., United States), and many others. Social media applications, such as, Instagram, Facebook, and Twitter, can also be used as an online tool to deliver online lectures.

The majority of the students (77.8%) had a good experience in understanding online lectures. Approximately 87% of students found that online lectures with PowerPoint presentations were more helpful to their learning. The study by Girik Allo also supports the finding of our study.<sup>12</sup> Based on the study results, the author concluded that the participants found online learning to be very helpful during this period of the COVID-19 pandemic. The study by Nuzhat et al. also supports the results of the present study which are based on gender differences.<sup>18</sup> In both the studies, female students

responded in maximum number as compared to male students. The authors proposed several factors that can influence student learning preferences, such as, gender, age, academic achievement, brain processing, culture, and creative thinking.<sup>18</sup> In the study by Asiry, most of the students (61.2%) were not satisfied with the quality of online lectures, which were contradictory to the results of the present study.<sup>9</sup>

In the present study, a very less percentage of students found online lectures to be more impactful than classroom lectures. Maximum students had a good experience in learning through online lectures, however, few students (48.9%) felt that there is a need for improvement in online lectures and most of them were male students. This denotes that the majority of students still prefer traditional classroom lectures over online lectures. The reasons for this might be students learning preferences, lack of attention, discipline during classroom lectures, intermittent internet connections, straining of eyes due to continuous attention toward the screen, quality of image or audio. These are some of the factors which may influence the future of online lectures in the education sector. The findings were in accordance with the studies by Asiry and Mgutshini,<sup>9,19</sup> Moazami et al. compared the effects of two methods of teaching (virtual vs traditional) on student learning. They concluded that a newly designed virtual learning package is feasible and will result in more effective learning in comparison with lecture-based training. These results were not supporting the results of the present study.<sup>20</sup> Similar contrasting results were also seen with a study by Pilcher.<sup>21</sup>

In consideration of the timetable schedule, most of the students were comfortable with a schedule of online lectures during the lockdown period. This might be because the schedule was planned in a similar way to how routine classroom lectures were planned. So, from the students' perspective, the schedule for online lectures created no difference. All the lectures were planned in the morning session. This result supports the findings of a study by AlHamdan et al. and opposes the findings of studies by Barron et al. and Rokade and Bahetee.<sup>13,22,23</sup>

Nearly half of student (48%) responses supported distraction during online lectures as compared to classroom lectures. This was supported by Zureick et al. who suggests that interruptions and distractions during medical learning activities whether live or recorded can have an important impact on learning outcomes.<sup>24</sup> Distraction during online teaching can be due to various factors, such as, the home environment different from the classroom environment, weak internet connection, usage of social media during online lectures, and the poor audio quality of the online lecture.

Almost all of the students knew how to capture screenshots of online lectures but nearly half of them did not know about the recording of online lectures. By taking screenshots or recording lectures students can make their notes or study material accordingly. If students have missed anything during an online lecture or if their doubts are left unsolved, they can revisit or rehear the recording of the online lecture.

In this study, 58.4% of students preferred the inclusion of online lectures in future dental education, whereas 76.4% of students opted for a combination of online lectures and classroom lectures. This shows the importance of digital involvement in dental education. Studies by Asiry, Reynolds et al., and Turkyilmaz et al. supported the blended approach of online lectures and classroom lectures in dental education.<sup>9,25,26</sup>

Agarwal and Kaushik recently conducted a survey to determine medical students' perception toward online learning during the COVID-19 pandemic. Similar to the present study, the authors found that the students had a good experience with online learning as the study material was easy to access and it helped to break the monotonous routine. Online learning facilitated students in diverting themselves from the ongoing pandemic situation, thus having a positive impact on their morale.<sup>27</sup>

The limitation of the study was that it only focused on undergraduate students of a single dental institution, so a study with a larger sample group should be carried out. This study only determined the perception of undergraduate dental students toward online lectures which are subjective in nature. More studies should be carried considering both subjective and objective outcome measures. Objective outcome measures majorly focus on the actual performance of students, knowledge gain by students from online lectures, and also teachers' attitude for the same.

## CONCLUSION

Based on the results of this study, it can be concluded that students had an overall positive attitude toward online lectures. However, students had an opinion that online lectures need further improvement to support their learning. Although online lectures cannot replace traditional classroom lectures, e-learning can be considered as a useful supplemental tool for continuing dental education during this COVID-19 lockdown period.

## CLINICAL SIGNIFICANCE

The concept of online teaching was explored globally in view of the pandemic of COVID-19. The use of online lectures, webinars, and continuing dental education was very helpful and informative for dental students. The curriculum and teaching were possible even in lockdown, maintaining social distancing. Thus, this study helps to find out the perception and understanding of dental students toward online lectures and teaching during the COVID-19 pandemic.

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