

Perception, Impact, and Barriers of Online Learning among Dental Students in Chennai City

R. Kesavan, A. Vinita Mary, Preethi Ganesh, P. Rithika Raj, V. Lalitha Priya, S. Elakiya

Department of Public Health Dentistry, Thai Moogambigai Dental College and Hospital, Dr. MGR Educational and Research Institute, Chennai, Tamil Nadu, India

Abstract

Background: Electronic learning is an influential technological tool that blends the traditional teaching and electronic resources and had become an imperative platform in supporting the education system in recent years due to COVID-19 pandemic. **Materials and Methods:** A cross-sectional questionnaire survey was conducted among the dental students across Chennai to evaluate the impact of online learning and to identify the barriers faced that will aid in formulating alternative strategies to reduce the difficulties and improve the quality of learning. The study population was selected based on certain inclusion and exclusion criteria. The data collection was done through a validated questionnaire with assistance from Google Forms. **Results:** It was found that around 67% of the participants had not attended any online classes before COVID-19. Half of them had Internet connectivity issues during online classes and about 62% of the students faced lots of distractions during online classes. When the participants were asked about their learning preference, majority of them responded that they were comfortable with the traditional method. **Conclusion:** It was concluded that students had experienced connectivity and other technical issues during these classes and most of them were able to manage it. The major disadvantage of online classes was they were not able to reproduce a practical and clinical hands-on experience, which is indispensable for health-care students. However, the students were able to cope up with it since there was the only choice existing.

Keywords: Challenges, COVID-19, influence, insight, online learning

INTRODUCTION

In recent years, electronic resources had become an imperative platform in supporting the education system owing to its quickness, accessibility, efficiency, and cost-effective in providing education to multiple individuals at anytime and anywhere across the globe, thus overcoming many traditional educational learning difficulties, such as geographical access, lack of classrooms, and financial constraints along with the scarcity of faculty.^[1,2]

E-learning or electronic learning is a powerful technological tool that blends the traditional teaching and electronic resources which supports and facilitates conventional education and learning methods through the use of information and communication technological tools (ICT).^[3] Computer-based e-learning is a flexible method of e-learning delivered through interactive elements of the computer applications, IC tools such as CD-ROM, hard disk, and software associated with learning materials as required. On the other hand, web-based learning or online learning includes number of activities involving

computers and interactive web-based networks simultaneously that acts as a replacement for the traditional classroom model.^[4] It also delivers active and interactive learning, which encourages collaboration, better understanding, and personality development and cultivates social skills and knowledge or idea-sharing practices among students as well as the teachers/instructors. It has also been found to satisfy diverse learning styles across the world, which is considered a successful transformation in teaching and learning model.^[5]

COVID-19 has dramatically reshaped the way global education is delivered. To reduce the disease transmission, all

Address for correspondence: Dr. R. Kesavan,

Department of Public Health Dentistry, Thai Moogambigai Dental College and Hospital, Dr. MGR Educational and Research Institute, Chennai, Tamil Nadu, India.

E-mail: keshavan84@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Kesavan R, Mary AV, Ganesh P, Raj PR, Priya VL, Elakiya S. Perception, impact, and barriers of online learning among dental students in Chennai City. *Int J Community Dent* 2021;9:180-4.

Received: 27-12-21; **Accepted:** 17-02-22; **Web Published:** 26-03-22

Access this article online

Quick Response Code:



Website:
www.ijcommunitydent.com

DOI:
10.4103/ijcd.ijcd_33_21

educational institutions including dental colleges were closed. Owing to the vast undergraduate dental syllabus and the pressure to complete it within the academic calendar, dental colleges resorted to online classes. The swift implementation of online classes led to a very new experience for both the students and educators.^[6]

A conventional dental teaching–learning practice mainly involves lectures/problem-based learning and laboratory/preclinical demonstration by teachers on models followed by clinical skill training where successful student–patient interactions take place. In the current pandemic situation, proper utilization of available ICT tools guided by virtual reality practices can reduce the fear and anxiety among dental students to ensure restoration of dental practices once the pandemic ends.^[7,8]

Challenges to online education reported in the dental literature so far include issues relating to time management, use of technology tools, students' assessment, communication, and the lack of in-person interaction. Besides, online education may not be equitable in terms of access and the quality of teaching. Some students do not have access to laptops, or sufficient Internet connection at home. Challenges to the online environment during an emergency may delay the adoption of technology-enabled education.^[9]

However, acceptance of these techniques needs a better understanding of advantages and limitations with sound knowledge. Hence, the present questionnaire survey was carried out to assess the perception, impact, and barriers of online learning among dental students.

MATERIALS AND METHODS

The present cross-sectional questionnaire survey was conducted among the dental students across Chennai to evaluate the impact of online learning and to identify the barriers faced that will aid in formulating alternative strategies to reduce the difficulties and improve the quality of learning. The study was conducted between June and October 2020. The ethical clearance was obtained from the Institutional Review Board of Dr. MGR Educational and Research Institute (DRMGRERI/TMDCH/EC/2021–22/1307036). The required information for the questionnaire was collected through published scientific articles pertaining to the study and a structured questionnaire comprising 20 questions in the English language was prepared and evaluated. The questionnaire consists of Section-A: socio-demographic status, Section-B: barriers of online learning, Section-C: impact of online learning, and Section-D: perception of online learning. The study population was selected by the following inclusion and exclusion criteria based on a convenient sampling method.

Inclusion criteria

1. Undergraduate dental students
2. Students belonging to dental schools of Tamil Nadu

3. Students who had English as their first language in school.

Exclusion criteria

1. Dental students who do not belong to the state of Tamil Nadu
2. Students who were not interested to participate in this study.

The questionnaire had both combinations of selected responses to certain questions and also few close-ended questions (Yes/No/don't know) along with demographic information such as age, gender, year of study, and occupation of the head of the family. The questionnaire was validated during a pilot study. It was found to have adequate internal consistency (Cronbach's alpha = 0.70). The content validity was done by a panel of experts who evaluated the importance of every item in the questionnaire. Since this study was conducted during COVID-19 pandemic lockdown period, online Google Forms were generated and distributed through social media platforms and all the participants were informed about the purpose of the study and assured that their participation was purely voluntary and confidential through an informed consent form.

Statistical analysis

The data obtained through Google Forms were transferred into Excel format and its analysis was done using IBM SPSS Statistics for Windows, Version 26.0. (Armonk, NY: IBM Corp). Descriptive statistics including frequency and percentages were calculated for all the responses given by the participants. Comparison between genders was made using cross-tabulations and statistical significance was assessed using Pearson's Chi-square test.

RESULTS

This study was conducted among 275 participants between the age of 17–29 years with the mean of 21.08 years of which 163 (59.3%) were female and 112 (40.7%) were male respondents. The students who majorly participated in this study were final years contributing up to 26.2% (70) of the responses, followed by CRRI: 21.8% (60), 3rd year: 19.6% (54), 1st year: 19.3% (53), and 2nd year: 13.1% (36).

Table 1 describes the frequency distribution for each response to the questionnaire among 275 participants. About 67% of the participants have not attended any online classes before COVID-19. Half of the respondents (52%) have faced Internet connectivity issues during online classes, but they also responded that it was manageable. Around 62% of the students faced lots of distractions during online classes.

Table 2 depicts the comparisons between male and female participants having varied responses to specific questions. There was a remarkable difference in the time spent on online learning between the genders of which females seemed to spend more time on online classes than males. Females accounted for 44 (27.0%) and male 11 (9.8%) for spending 5–7 h on online learning.

Table 1: Responses of the participants to various questions

Questions	Options	Frequency (%)
Have you attended any online classes attended before COVID-19 lockdown?	Yes	90 (32.7)
	No	165 (67.3)
Device used for online learning	Laptop	70 (25.5)
	Desktop	26 (9.5)
	Smartphones	173 (62.9)
	Tablets	6 (2.2)
Time spent on online learning (h)	1-3	87 (31.6)
	3-5	133 (48.4)
	5-7	55 (20.0)
	7+	0
Type of neighborhood resided in during online class	Urban	146 (53.1)
	Suburban	91 (33.1)
	Rural	38 (13.8)
Internet connectivity issues faced during online classes	Yes, the connection was poor	72 (26.2)
	Yes, but manageable	145 (52.7)
	No, but occasionally	51 (18.5)
	No, had no issues at all	7 (2.5)
Technical issues faced while connecting to online class	Yes, all the time	77 (28.0)
	Sometimes	182 (66.2)
	Not at all	16 (5.8)
Impact of online class on finances	Yes, positively by a reduction in commute charges and many others	171 (62.2)
	No, it increased the expenses	104 (37.8)
Impact of online class on health	Yes	215 (78.2)
	No	60 (21.8)
Health issues faced	Headache	40 (14.5)
	Neck pain	29 (10.5)
	Back pain	38 (13.8)
	Eye sight problems	20 (7.3)
	All of the above	120 (43.8)
Stress felt during online class	Yes, absolutely	98 (35.6)
	Yes, moderately	101 (36.7)
	No, but sometimes	68 (24.7)
	Not at all	8 (2.9)
Change in sleep pattern due to online class	Yes	155 (56.4)
	No	120 (43.6)
Have additional time compared to traditional learning	Yes, I had more personal time	161 (58.5)
	No, it consumed more time	114 (41.5)
Study materials used for teaching	PowerPoint presentation	183 (66.5)
	PDF of books	38 (13.8)
	Video demonstrations	13 (4.7)
	Pedagogy	33 (12.0)
	Discussions	8 (2.9)

Contd...

Table 1: Contd...

Questions	Options	Frequency (%)
Materials used for reference	PowerPoint Presentations	141 (51.3)
	Books	87 (31.6)
	YouTube Videos	40 (14.5)
	Dental Apps	7 (2.5)
Effect on concentration while learning from home	Was able to concentrate peacefully	101 (36.7)
	Had too many distractions	174 (63.3)
Effect of online classes on retainability of subjects	Could retain all the key points	38 (13.8)
	Could moderately retain	131 (47.6)
	Helped to have a preview	93 (33.8)
Did learning experience from online classes aid you practically?	Not at all	13 (4.7)
	Yes, absolutely	43 (15.6)
	Yes, but still have some doubts	109 (39.6)
Major advantage of online learning	No, but I have a preview	99 (36.0)
	Not at all	24 (8.7)
	Improved technical issues	72 (26.2)
	Does not demand a heavy schedule	55 (20.0)
Improved quality time with family and friends	Commute to college is reduced	105 (38.2)
	Commuter to college is reduced	43 (15.6)
	Yes, absolutely	48 (17.5)
Did you enjoy online learning?	Yes, but would like to have some changes	114 (41.5)
	No, they were quite a challenge	96 (34.9)
How do you feel overall about online learning?	Not at all	17 (6.2)
	Excellent	31 (11.3)
	Good	19 (39.6)
	Average	122 (44.4)
Type of method preferred for learning	Below average	13 (4.7)
	Online	46 (16.7)
	Traditional	122 (44.4)
	Both A and B	107 (38.9)

The study revealed that 78.2% (215) of the total participants had a negative impact on their health due to online classes and 63.3% (174) of the participants felt that they were not able to concentrate on online classes while attending classes from home.

Overall, when participants were asked about their preference on which method do they prefer for learning, they majorly responded that they are comfortable with the traditional method of teaching.

Table 2: Comparison between gender for certain specific questions

Questions	Options	Male, n (%)	Female, n (%)	P
How much time did you spend on online learning?	1-3	45 (40.2)	42 (25.8)	0.001*
	3-5	56 (50.0)	77 (47.2)	
	5-7	11 (9.8)	45 (27.0)	
Did you face any technical issues while connecting in?	Yes, all the times	37 (33.0)	40 (24.5)	0.034*
	Sometimes	65 (58.0)	117 (71.8)	
What type of study materials were used for teaching?	Not at all	10 (8.9)	6 (3.7)	0.004*
	PowerPoint presentation	62 (55.4)	121 (74.2)	
	PDF of books	18 (16.1)	20 (12.3)	
	Video demonstrations	10 (8.9)	3 (1.8)	
	Pedagogy	19 (17.0)	14 (8.6)	
	Discussions	3 (2.7)	5 (3.1)	

*Statistically significant, Pearson's Chi-square test

DISCUSSION

The present study was aimed to describe and clarify the perceptions, impact, and barriers of online teaching among dental students during the coronavirus pandemic situation. It is important to understand these perceptions to enable government and decision-makers to develop solutions immediately.^[10] Due to the sudden shift from traditional learning experiences to online classes, dental students faced a lot of challenges such as lack of experience, lack of preparedness, and unequipped learning materials in the form of notes and textbooks. It is also evident that clinical teachings at chairside, laboratory skills, problem-based learning, and community field learning were not possible with the online teaching format.^[6]

In this study, a remarkable difference in the time spent on online learning was observed between the genders of which females seemed to spend more time on online classes than males. Females accounted for 44 (27.0%) and male 11 (9.8%) for spending 5–7 h on online learning. Yu, in an observational study, noted that females could achieve higher learning outcomes than males because they were more persistent, committed with stronger self-regulation than males which also led to their significantly more positive perception toward online learning. The gender differences in learning outcomes also revealed that males were more stable in attitudes, while females performed well in engagement activities.^[11]

In contrast to the present study, Yau and Tang have noted that males tend to use technology with positive and favorable attitudes, whereas females show less interest in technology-related courses like e-learning. They also revealed that time spending on technology-related courses as well as e-learning courses by males are believed to be more than the females.^[12] From the above observations, it is clear that advanced technology provided convenience for students in pursuing e-learning courses easily irrespective of the gender difference.

The study revealed that 78.2% (215) of the total participants had a negative impact on their health due to online classes. Similar to the present study, Samra *et al.* reported that factors such as poor Internet connectivity, interrupted power supply, vague learning contents, overloaded assignments and poor learning environment leads to health problems and negative impact on overall health status.^[14] On the other hand, Iurcov *et al.* identified a higher level of concern regarding their mental health than their physical health. Thus, the use of excessive technology caused disordered and unhealthy eating habits, appetite, and sleep disorders.^[13]

About 63.3% (174) of the participants felt that they were not able to concentrate on online classes while attending classes from home. This could be due to lack of face-to-face interaction, increased stress levels, depression, and anxiety along with decreased physical activity^[13] even though online learning allowed students to attend lecture classes at their own comfort zones, make better notes with available technologies, and also avoid long travel-related issues. A common reason for negative impact on both physical and mental status was attributed to the difficulty in adjusting to new learning methods, loss of connection during classes due to poor or unstable network availability, family-related disruptions and/or responsibilities at home, and poor communication between faculties and students.^[14]

Majority of the respondents are comfortable with the traditional method over the online teaching method and prefer the traditional method of learning. The lack of patient or clinical exposure created a fear in the minds of dental students which appeared to be one of the major obstacles for e-learning.^[15] Steps needed to be taken by incorporating innovative ideas such as clinical case discussions in a separate interactive class, video demonstration of clinical procedures and physical examination methods, and integrating clinical case discussions while teaching certain topics through social media platforms to aid in clinical interest and enhance diagnostic skills.^[14,16]

CONCLUSION

The present study highlighted the difficulties as well as positive outcomes handled by dental students during online classes over the past 1 year due to COVID-19 pandemic. It was concluded that students had faced Internet connectivity and other technical issues during these classes and most of them were able to manage it. The major disadvantage of online classes was they were not able to reproduce practical and clinical hands-on experience, which is indispensable for health-care students. However, the students were able to cope up with it since there was no other option available.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Joshi A, Gupta K. Elementary education in Bharat (that is India): Insights from a postcolonial ethnographic study of a Gurukul. *Int J Indian Cult Bus Manage* 2017;15:100-20.
2. Linjawi AI, Alfadda LS. Students' perception, attitudes, and readiness toward online learning in dental education in Saudi Arabia: A cohort study. *Adv Med Educ Pract* 2018;9:855-63.
3. El-Hamed Diab GM, Elgahsh NF. E-learning during COVID-19 pandemic: Obstacles faced nursing students and its effect on their attitudes while applying it. *Am J Nurs Sci* 2020;9:295-309.
4. Cook DA. Web-based learning: Pros, cons and controversies. *Clin Med (Lond)* 2007;7:37-42.
5. Alsabawy A, Cater-Steel A, Soar J. Determinants of perceived usefulness of e-learning systems. *Comput Hum Behav* 2016;64:843-58.
6. Nepal S, Atreya A, Menezes RG, Joshi RR. Students' perspective on online medical education amidst the COVID-19 pandemic in Nepal. *J Nepal Health Res Counc* 2020;18:551-5.
7. Jang HW, Kim KJ. Use of online clinical videos for clinical skills training for medical students: Benefits and challenges. *BMC Med Educ* 2014;14:56.
8. Turkyilmaz I, Hariri NH, Jahangiri L. Student's perception of the impact of e-learning on dental education. *J Contemp Dent Pract* 2019;20:616-21.
9. Rajab MH, Gazal AM, Alkattan K. Challenges to online medical education during the COVID-19 pandemic. *Cureus* 2020;12:E8966.
10. Abuhammad S. Barriers to distance learning during the COVID-19 outbreak: A qualitative review from parents' perspective. *Heliyon* 2020;6:e05482.
11. Yu Z. The effects of gender, educational level, and personality on online learning outcomes during the COVID-19 pandemic. *Int J Educ Technol High Educ* 2021;18:14.
12. Yau HK, Tang ST. Gender difference of time spent on computer to learn e-learning courses in Hong Kong higher education. In: *Proceedings of the International Multi Conference of Engineers and Computer Scientists 2018*. Vol. 2. Hong Kong: IMECS; 2018.
13. Iurcov R, Pop LM, Iorga M. Impact of COVID-19 pandemic on academic activity and health status among Romanian medical dentistry students; A cross-sectional study. *Int J Environ Res Public Health* 2021;18:6041.
14. Samra RK, Nirola A, Verma A, Nagpal A, Thakur M. Dental students' Perception on the impact of E-learning in continuing dental education during the current pandemic scenario. *Indian J Dent Sci* 2021;13:61.
15. Asiry MA. Dental students' perceptions of an online learning. *Saudi Dent J* 2017;29:167-70.
16. Mgutshini T. Online or not? A comparison of students' experiences of an online and an on-campus class. *Curatationis* 2013;36:1-7.