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RESEARCH ARTICLE

Online Learning: A Lifeline during COVID-19 Crisis

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Abstract

Objectives: An observational research was conducted on second-year BDS students to assess the students' early experiences with online teaching approaches and their usefulness during the pandemic. **Method**: A total of 250 second-year BDS students from several dental colleges in the state of Karnataka, India participated in the study to assess their formative experiences with online teaching methods. The questionnaire was created with Google forms which comprised largely of closed-ended questions along with some open-ended ones. The research was carried out for a month after the start of online education. The data were analyzed via the histogram and pie chart visualizations in Google form responses. **Results**: The results showed that online instruction had been very effective due to its flexibility and interactiveness. However, the vast majority of dental students (more than 80%) thought that online education reduced their direct contact with patients, therefore limiting their practical experience/skills. **Conclusion:** The research depicts the importance of online teaching methods for dental students for them to keep up with their studies. It also demonstrates how this structure restricts their practical experience and skills.

Keywords: COVID-19; Classroom-teaching; Dental Education; E-learning; Online Education

1 Introduction

The COVID -19 pandemic, which was induced by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), had an impact on the lives of the entire population globally.[1,2] It not only has a negative influence on health, but also interferes with the worldwide economic and social activity. To curb its spread, the governments were forced to implement blockade, isolation and social distancing. However, this method has unintended consequence of limiting social activities. Since most countries throughout the world witnessed a temporary shutdown of all educational institutions to prevent the spread of the epidemic, the educational sector has transitioned from traditional

classroom instructions to e-learning.[3]

The three main components of dental education are lectures, clinical skill training and simulated training courses that necessitate close interaction with patients.[4] Therefore, maintaining distance during the dental education process is not always possible.[5] Dentists and dental students face a high risk of coronavirus infection as they are bound to attend to the patients routinely without being able to practice physical distancing. During dental procedures, they are frequently exposed to saliva and blood. Furthermore, tooth preparation and ultrasonic cleaning produce aerosols that can spread the virus at a faster rate. As a result, online dental education appears to be a viable alternative for preventing COVID-19 from spreading among students.[1]

Rapid technological advancements like mobile phones, tablets and laptops, can give students convenient ways to attend lectures and connect with teachers. E-learning enables students to learn outside the classroom environment, boosts student engagement, cognitive effectiveness, and flexibility. As a result, learning has shifted from passive, teacher-centered to active, student-centered mode as it is cost-effective and time-saving. Teachers can use media such as text, graphics, animation, video, and audio to represent content in e-learning.[6] Students can also save and revisit these lectures at any time and from any location. Virtual patients, on the other hand, aid dental students in the development of clinical skills such as interviewing the patient, obtaining their medical history, and observing their symptoms, laying the groundwork for their future professions.[5]

During these tough times, most places were under lockdown making it difficult for dental students to attend college. In this pandemic circumstance, we conducted a small study to assess the dental students' early experiences with online teaching approaches and their usefulness, the disadvantages of online teaching, and to identify areas where online teaching might be improved in the future.

2 Material And Methods

250 second-year BDS students volunteered for a cross-sectional observational study from various dental colleges in the state of Karnataka, India to assess the students' early experiences with online teaching techniques using a questionnaire created on Google forms. This consisted of mostly closed-ended questions with a few open-ended ones.

2.1 Ethical considerations

The Institutional Ethics Committee accepted the study, and complete compliance with the Helsinki Declaration on the Rights of Research Participants was ensured. The study was entirely voluntary, and participants were allowed to leave at any moment with no consequences. Students were only allowed to join the study group after giving their voluntary informed consent.

The students' initial learning experiences in the online teaching approaches were compared to classroom teaching after one month of implementation. Demographic profile, prior exposure to any type of online teaching, knowledge and understanding of the subject taught, simplicity of attending classes, ease of access of instruction media, the comprehensibility of educator, the convenience of note-taking, doubt clarification, opinion on assessment in the online mode of teaching, challenges experienced in the online mode of teaching, methodologies to which they have been exposed, recommendations for improving current online teaching methodologies were taken into consideration.

For all four Teaching-Learning Methods (TLM), students used a Likert scale of 1 to 5 to answer the questions, which comprised of YouTube, Live tutorials/zoom platform, and online question banks and tutorials that have already been recorded previously.

3 Results

In this research, 250 second year BDS students from various dental colleges in the state of Karnataka, India were enrolled. The Google form was delivered through email. Out of 250 enrolled candidates, 114 participants responded to the Google form.

The participants consisted of 72.8 percent girls and 27.2 percent boys. Before the pandemic, during their online learning programs, a majority of students used YouTube and Zoom Platform. Around 48.2 percent of students were engaged with YouTube, which is one of the most popular platforms, and 36 percent of them utilized Zoom, which has gained popularity in the recent years. A majority of students revealed that both of these online platforms were more effective than online question banks and pre-recorded tutorials. On an average, students spend 3-4 hours every day online. Before the pandemic, more than 59 percent of students reported that their university had embraced online learning by providing live lessons. Furthermore, 50.9 percent of them said the online sessions were interactive. In this regard, 26.3 percent thought most of the sessions were interactive, while 17.5 percent said they were not.

A majority of the students (60.5 percent) provided their opinion that the sessions were interactive through speech. 21.1 percent through a quiz, and 14 percent through chat box communication. Students agreed that online education was interactive,

but mixed responses were seen on it being stimulating and engaging. A majority of the students disagreed on it being equally efficient as physical classroom learning. A majority of the dental students (80 percent) believed that online teaching has been proven to be beneficial owing to its flexibility. A large number of students (57 percent) said that the loss or disruption of internet connection acted as a barrier to online education along with having family distractions.

However, the majority of dental students (80 percent) believed that online instruction limited their direct connection with patients, reducing their practical experience/skills. According to students, the COVID-19 Pandemic has also had a significant impact on their examinations.

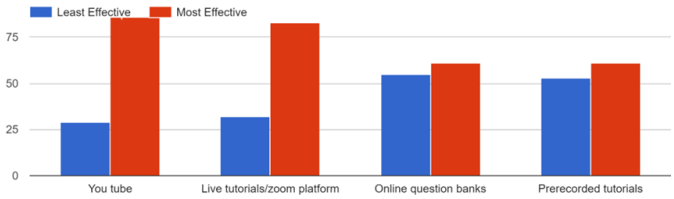

Fig 1. Which Method of online teaching was found effective ?

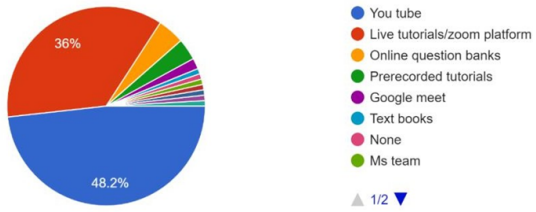

Fig 2. Prior to pandemic, which online learning platform were you engaged with ?

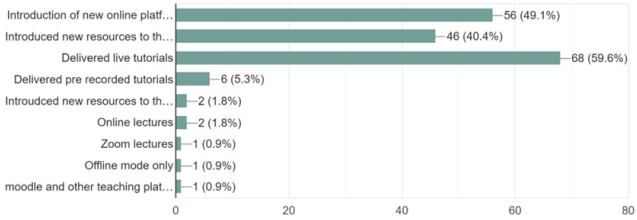

Fig 3. During Covid 19 pandemic, how has your institution adopted the teaching for your year ?

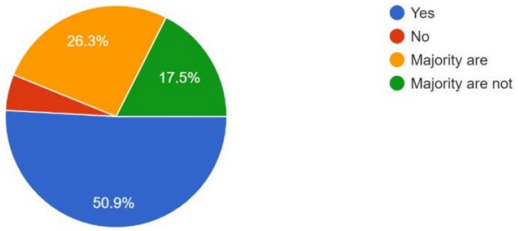

Fig 4. Are these online sessions interactive ?

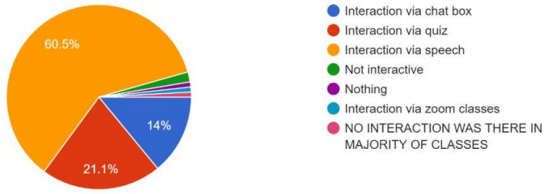

Fig 5. Are these online sessions interactive ?

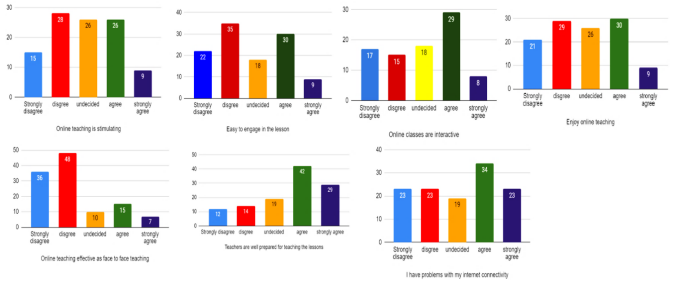

Fig 6. Perception about online learning ?

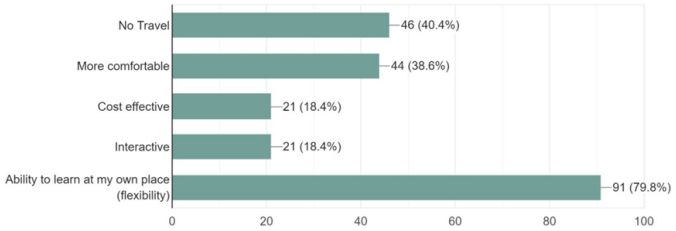

Fig 7. What aspects of online teaching do you enjoy?

Fig 8. What are the barriers of online teaching ?

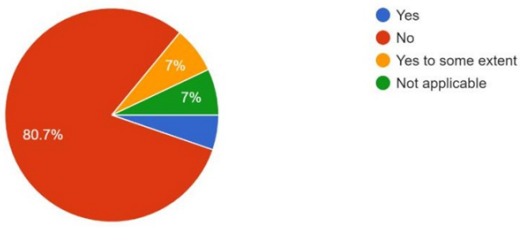

Fig 9. Do you feel you could acquire practical skills by online teaching ?

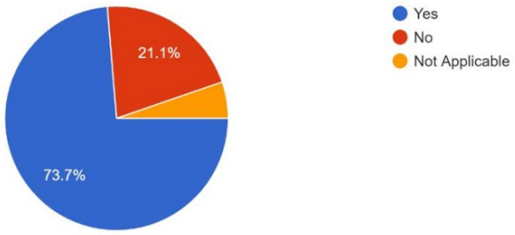

Fig 10. Have your examinations been affected by Covid 19 ?

4 Discussion

In Western countries, the usage of technology in the form of eLearning is becoming more widespread, and it has become an effective route of teaching. However, in India it is still in its nascent stages and is mostly restricted to the use of audio-visual aids and power point presentations. Only a few dental schools in India utilize Learning Management Systems to provide course material, conduct assessments, and monitor learning. The majority of dental institutions in India require digital infrastructure upgrades. [(1)] [(7)]

The COVID-19 pandemic has shifted professional training to digital platforms, resulting in increased class participation by students owing to ease of access and their anonymity. These factors encourage students to ask more questions, resulting in increased student involvement. Free webinars are also available for sharing of opinions. E-learning has several advantages over conventional classroom sessions. It removes time and location barriers, is convenient, assures instructor availability, gives more control over the content and speeds up the process of learning, and thus it is a more effective learning platform. [(8)] [(9)] [(10)] It has been demonstrated to enhance retention speed and effective utilization of content. However, students believe that classroom teaching is more successful in achieving educational targets which encourages them to attend classes. [(11)] The situation has been exacerbated further by faculty and students' computing skills. As a result, teachers must dedicate more time and effort in developing online programs. Inadequate infrastructure, including unsteady bandwidth, which results in lower audio and video output signals and slower internet speeds, lack of stable internet, software and hardware issues, recurring electrical power breakdowns, and a shortage of funds and support for this online learning platform, exacerbates the challenges for low- and middle-income nations. [(12)] [(13)] Though professors can pace their lectures based on visual indicators in the classroom, students have varying abilities, thus "one size doesn't fit all." Since teachers in online teaching lack visual signals, the pace of instruction cannot be adjusted toward comprehending and note-taking speed. [(14)]

With this background, the present study evaluated the early experiences, satisfaction, and preferences of 114 dental students associated with online dental teaching. Dental education could be taught in a variety of ways, especially online. It was found that recorded videos had the greatest ranking in online methodologies. This preference could be because students can download the sessions and go through them without disruptions in contents missing slides, audio delays, or cracks when using this format. Even in areas with poor internet access, downloading takes some time, but once completed, students may browse over information and take notes at their leisure. Because these lessons were delivered through voice over, the only thing they lacked was interaction. [(14)] [(11)] [(15)]

The present study group also stated that due to internet connectivity issues, their experience with online teaching pedagogy was not pleasant and synchronous during the first phases of the COVID-19 epidemic's online teaching rollout. Furthermore, 92.6 percent of the students were forced to attend classes and read eBooks on their phones' small screens, which was incredibly inconvenient and hindered their learning experience. If these youngsters had access to books and had been on campus to take advantage of the equal opportunity to use the internet, their viewpoint would have very likely changed. [(16)] [(17)]

Therefore, from the study we suggest that an interactive module that delivers the information, practical examples such as case scenarios and exercises such as multiple-choice questions could improve online teaching and learning. Students will be more engaged if flipped learning is used, which requires students to prepare before their online lesson. Other important strategies include using webinars to deliver lessons, providing appropriate evaluation and feedback, and demonstrating self-regulation in students. [(18)] [(19)]

Previous studies by several authors reveal that lesser students embraced the online teaching learning process with an open mind. According Asiry et al, only a few students enjoyed online teaching, and even fewer consented to substitute traditional lectures for online tutorials, whilst a majority of the students supported a blend of both teaching techniques. [(20)] Yu-Fong Chang et al stated that, students believed in the convenience and impartiality of conventional classroom examinations being superior to

those of online examinations.[4] Mulgrew et al. asserted that despite the prominence of web-based learning resources, students persisted to appreciate the ability to communicate face-to-face with their educators[21] In agreement with this study, S. Acharya et al concluded that the majority of students believed that classroom lectures were the most effective method of transmitting knowledge, and that online teaching was less engaging.[6] Overall, these studies prove that the students preferred online modules to be used as a supplement to learning rather than as a replacement for traditional lectures. In reality, a hybrid strategy that combines face-to-face contact with e-learning approaches appears to be the most desired.

Furthermore, instructors should receive proper training on the teaching process, particularly on how to engage students in case of a blended mode of learning. In this case, communication is crucial, and instructors should employ a "tell, explain, and assess (TEA)" technique. Explain instructional materials using particular examples and media, and then gauge the information consumed by the pupils.[22] Finally, rigorous preparation and well-coordinated instruction delivery with the use of educational technology are recommended for a successful online collaborative learning. Simultaneously, intradepartmental, interdepartmental, and complete institutional management assistance is required. The continuous efforts of instructors, institutions, and students to overcome deficiencies during the COVID-19 era have the potential to elevate medical education to a whole new level.[23] [24] [25] [16]

Overall, the experience was greatest in classroom teaching, and it was unaffected by gender or geographical region. A majority of dental students believed that online teaching has been proven to be beneficial owing to its flexibility. The addition of an e-Library containing a microcosm of books from varying subjects will further enhance the learning experience for students. After online sessions, instructors could include problem-solving assignments and assessments to encourage students to actively participate in the learning process. This will provide feedback on their understanding and will induce self-discipline in the student.

5 Conclusion

The results showed that online instruction had been very effective due to its flexibility and interactiveness. However, the vast majority of dental students (over 80%) believed that online education limited their direct interaction with patients, decreasing their practical experience and skills. Students also felt that the lack of internet access and family distractions impacted their ability to learn. They also reported that the pandemic had a substantial impact on their examinations. Future recommendations suggested are that the student's learning experiences will be further enhanced by the addition of an e-library comprising a collection of books relating to all topics. Instructors should offer problem-solving assignments, assessments, or homework after online sessions to encourage students to participate actively in the learning process.

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