Will the COVID-19 pandemic be a harbinger of change in dental education

Soon after the World Health Organization declared the COVID-19 outbreak a public health emergency of international concern on January 30, 2020, and a pandemic on March 11, 2020, every aspect of life as we knew changed. Education was one of the areas that were quick to try and adapt to the new normal, to maintain continuity in education. Technology was scaled up at every level, as educators and students learned to effectively teach and learn in the virtual mode.

Dental colleges, under the guidance of various regulatory authorities and government policies, quickly tried to adapt to the new normal to ensure the learning outcomes for their students as prescribed by Dental Council of India. However, there is a need to consider the impact of these decisions from the student's perspective. Traditionally, the Bachelor of Dental Surgery and Master in Dental Surgery program include didactic teaching, preclinical laboratory courses and clinical skills training. Didactic teaching can easily shift to online mode. Preclinical lab courses typically involve demonstration by the teachers, followed by practice on models, mannequins, etc., along with guided step-by-step assessment by teachers. The course objectives can be achieved by the use of modern digital technology with manikins and virtual reality/augmented reality-based stimulation devices along with haptic technology, but the necessary infrastructure for this digital transition is not yet easily available in most Indian universities and colleges. Clinical skills training in the 3rd year, 4th year, and during internship is perhaps the most essential part of dental education. Close contact between the patient, dental student/intern, and the teacher is an integral part of the teaching–learning process. Adapting this aspect of dental education to pandemic times is the biggest challenge. Research at the undergraduate and postgraduate level is also integral to modern dental education. Clinical research work has been suspended in most countries; however, some limited *in vitro* studies and literature reviews which could be done on the computer at home has continued.[1] Besides the lockdown restrictions, that closed all educational institutions across India, clinical training of dental students was also impacted by the fact that the SARS-CoV-2 virus is present in the saliva, nasopharyngeal secretions and aerosols in large numbers, and so dental practice which invariably requires the dental surgeon to be in very close proximity with the patient was declared as a high-risk area with respect to COVID-19 transmission.[2]

Surveys have shown that students adapted well, and some even prefer online teaching for their theory classes, for the flexibility, it offers in terms of pace of learning and convenience of scheduling.[3] However, most students felt that their clinical training was negatively impacted, with a significant proportion of final-year students not being confident of their clinical skills at the time of graduation and a significant proportion feeling that they would need direct or indirect mentoring and supervision following graduation.[4] In response to this felt need, it should be incumbent to develop mechanisms to allay these anxieties. However, it was interestingly noted that, though students were concerned about their clinical training being negatively impacted, they were not prepared for any extension in the duration of the course, their work hours or even a curtailment of the vacations.[3]

The COVID-19 lockdown and resulting restrictions and confinement to homes were a new experience for students and initially "online" education was a new, unique experience. However, it soon gave way to the harsh reality of digital divides, inadequate internet connectivity and the realization on the part of both students and teachers that e-lectures were not a substitute for face-to-face lectures, in which didactic teaching was necessarily accompanied with the development of student–teacher bonds that added an

invaluable dimension to the teaching–learning process. One study has shown that there was an improvement in students' academic performance during the COVID-19 confinement.[5] However, most other studies have reported a lack of confidence among graduating dental students in performing clinical procedures independently, without supervision and starting their own dental clinics.[4] It can be stated quite definitively that clinical training in all dental specialties will be adversely affected by the various challenges that have emerged as a consequence to the pandemic. Hattar *et al.* reported that students were least confident about those clinical specialties, in which they had missed their clinical postings due to the lockdown.[4]

As it has been established that COVID-19 spreads through aerosols, dental treatment has been considered "risky" by both patients and dental surgeons alike. Many dental educators have been in favor of indefinitely postponing aerosolizing procedures till the end of the pandemic.[6] Thus, it has become necessary to ensure a safe working environment in dental clinics, both in dental colleges and in private dental clinics. In fact, the pandemic may well be a flexion point that will make it mandatory for all dental clinics to ensure robust infection control measures, even after the pandemic is over. However, studies have shown that routine use of rubber dams, high-volume suction along with personal protective equipment can significantly reduce viral transmission in the dental clinic.[7] Virus infectivity rates are highly dynamic, showing variation from place to place and time to time. Thus, close and continuous cooperation is required between all the concerned people such as faculty, administrators, nurses, assisting staff, and students to actively monitor guidelines and keep updated with the evolving evidence that can guide decision-making in developing the most effective infection control protocols to ensure a safe working environment for all.

Studies also indicate that graduating dental students have experienced high stress levels as their clinical training has been negatively impacted by the pandemic.[8] The literature suggests that, even in the pre-COVID-19 times, significant proportion of dental students drink excessively and experiment with drugs.[9] The lockdown and associated "stay at home" restrictions, leading to reduced contact with friends and peers may well push susceptible students toward making poor health choices. There is a need to enhance counseling and other student support systems in our dental colleges. Maintaining good communication with students and involving them in the decision-making process can help to reduce anxiety and equip them to adapt better to the current situation.

The current situation can be a "wakeup call" for relooking at dental education in India, which has not undergone any significant change in the last several decades. Inclusion of outreach teaching–learning experiences such as including community dental care, involving private dental practitioners in externship programs as a part of the curriculum can be very useful adjuncts for clinical training, development of communication skills and for building self-confidence in graduating dental students.

The academic community has to actively plan for a paradigm shift in dental education by developing modern teaching and assessment methodologies that will ensure that students are able to achieve their clinical competencies and are confident of independent dental practice. The American Dental Education Association took the lead with recommendations for developing teaching modalities on the online platforms and other innovative methods of pedagogy. Regulatory bodies can similarly help to create a community of dental academicians to share ideas and resources to achieve the best learning outcomes for our students.[10]

Besides ensuring continuity of academic activities, the teaching community should also recognize the need to augment student support systems such as counseling and mentoring in their institutions.

The COVID-19 pandemic may well serve, not as a detriment to education, but a learning experience which will lead to a redefining of dental education. A hybrid or blended program that incorporates clinical training on patients and robust infection control protocols with remote learning using advanced digital technology and artificial intelligence in simulators and skill labs may underpin dental education in the postpandemic world. Such developments may well reduce the time and dependence on the actual number of patients attended to by a dental student, being while still maintaining the highest standards of dental clinical training. It is now incumbent on the dental academic community to be proactive in framing policies and guidelines that will define the beginning of a new era in dental education.

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