

Impact on Dental Education in India: The Covid-19 Effect

Mayur Nath T Reddy¹, M Divya Bharathy²

Author's Affiliation: ¹Professor, ²Student, Department of Public Health Dentistry, Vydehi Institute of Dental Sciences and Research Centre, Bengaluru 560066, Karnataka, India.

Corresponding Author: M Divya Bharathy, Student, Department of Public Health Dentistry, Vydehi Institute of Dental Sciences and Research Centre, Bengaluru 560066, Karnataka, India

E-mail: dbdb8487@gmail.com

How to cite this article:

Mayur Nath T Reddy, M Divya Bharathy/Impact on Dental Education in India: The Covid-19 Effect/*Indian J Dent Educ.* 2021;14(1):19-24.

Abstract

The novel COVID-19 pandemic is rapidly evolving with increase in the statistics on a daily basis and the dental colleges in India are reeling from the repercussion of the pandemic. It is important that the dental students and faculty remain aware about the updated regulations and guidelines released by the international and national authorities. However, reviewing the literature, there is no official information that exists for dental institutions to ensure continuity of dental education by effectively following the recommended guidelines including 'shelter in place' to safeguard students, staff and patients with social distancing. And also, little research has been published on the potential impacts of COVID-19 pandemic on dental education, but it is an inescapable phenomenon that can have a drastic impact on how the future dentists are educated. It may represent an enduring transformation in dentistry with the advancement encouraging innovation and imagination. Hence, the article talks about the challenges which we face currently and gives some simple strategies to connect the gaps in dental education at present to overcome this emergency.

Key-Words: COVID-19; Dental Education; India; Pandemic; Technology.

Introduction

Globally, Mankind is currently facing very difficult times, with the novel Corona virus infection, a pandemic of enormous proportions which hardly people would have thought of as possible by any flight of fancy, except perhaps in a science-fiction movie.¹ However, It is not the first time that mankind is going through such a fearful situation.² Whenever there is a breach in the peaceful coexistence between widely diverse fauna and flora, micro-to macro-cosmos has seen repercussions. Henceforth, the concept of one health can never be underestimated.³

These are unprecedented times. Statistics is changing on daily basis and rapidly. With the coronavirus pandemic, people all over the world have become more aware of the best practices, from careful hand-washing to social distancing.² And also to control the pandemic,

World Health Organization has emphasised early testing, prevention, meticulous sanitisation, social distancing and lockdown for flattening the epidemiological curve, and urged that defiance of these preliminary measures will result in worsening of the pandemic.⁴

The entire area of India is now a 'red zone' with multiple limitations imposed on education, work and transport. All the Indian Schools and Universities suspended teaching activity on 18th March, 2020. The rationale behind this decision was to minimise the spread of the virus between different persons of different areas in the hope of reducing the transmission of the infection.⁵ Although the current focus has been to care for individuals and community, the emergence of nCoV (COVID-19) has disrupted dental education and this requires intense and prompt attention. The profound effect of nCoV may forever change how future doctors are educated.

However, a comprehensive description of the effect of COVID-19 on dental education in India has not been reported yet. Henceforth, this article talks about the current status of dental education, challenges in both the learning and teaching environments, and also explores potential implications of COVID-19 for the future of dental education.

Dental Student Education in 2020

Today, in many dental institutions, students gather in physical settings during the initial years for interactive discussions on applied basic sciences; their physical presence has been an unquestioned canon of early clinical immersion experiences. The last few years of dental college may be individualised, with students participating in advanced clinical rotations. COVID-19 has the ability to affect students throughout the educational process.

Immediate effect on the education sector was noticed very soon after the announcement of the demand for “social distancing”, since the emergence of COVID-19 pending development of a vaccine, treatment, or both and minimising all face-to-face communication including teaching and educational activities. Although open and direct communication with staffs, peers and the educational team is proven to increase the level of cooperation and trust⁶, the regulatory bodies across the world advised the higher educational institutions to prioritise wellbeing and safety of their staff and students by ceasing all on-campus teaching sessions. Subsequently, all the dental institutions and post-graduate lecturers had to stop their routine face-to-face educational sessions and preclinical teaching by hands-on technique as well as the clinical training through supervision and had to shift to alternative teaching and assessment methods such as online webinars, lectures, case discussion sessions, report writing and computer-based exams. Thanks to modern technology which is at most of our fingertips, it is practical for the students to access the contents of each lecture from home and avoid unnecessary attendance at the lectures than can add-on to the risk of spread of infection. E-learning in some way encourages self-learning independency amongst the students and improves their ability to use online resources.⁵

Challenges in Teaching and Learning

Ideally, the student is part of the team as a learner who requires supervision. Formation of students’ professional identity relies on teaching and role modelling in dental settings as students learn to

prioritise patients and aspire to altruism.⁷ The Dental Council of India (DCI) and Indian Dental Association (IDA) has taken the lead with regard to recommendations for teaching modalities like online education and other innovative teaching approaches, connecting faculty and administrators to share ideas and resources to implement in these unusual times.

The biggest challenge till date has been to postpone the direct patient care, which is the utmost key component of dental curriculum.⁸ No virtual classes can duplicate the close experience with patients. Also, social distancing precludes students from gathering in learning studios, lecture halls, or small-group rooms. Within the past few years, many faculty were already “flipping” the classroom to provide individualised instruction for asynchronous learning “anytime/anywhere.” However, students still tried to convene for small sessions with standardised patients and in authentic patient care environments mostly Minor OTs after testing for COVID-19.

In response to COVID-19, Technology is very useful but, for many faculty and students, it involves a learning curve.⁹ Dental institutional staffs have quickly transitioned the entire curriculum to online sessions that include content in basic sciences, dental sciences, and even in case discussions. Small-group formats convoke online in virtual team settings, and clinical instruction sessions may tend to occur online or, in most cases, may be deferred. Examinations like the internal assessments have also transitioned to online settings. Updating the content material may be a benefit of the online teaching and virtual activities seem to be functional, but the outcomes of these changes will require ensuing evaluation. The transition from a college setting to an home setting results in isolation, an increased use of internet, and struggles with establishing boundaries between college and home, which could affect faculty, students, and also the support staff.⁷

In addition, most in-vivo and in-vitro dental research projects and post-graduate student’s research projects were suspended due to mandatory institutional and government policies limiting the at-present less important research activities. Therefore, some dental researchers had to shift their focus to off-campus and online methods of research such as conducting surveys online and carrying out literature reviews.¹⁰

Literary Approaches To Manage Such Situation

The biggest challenge for the management of dental institutions is to try to balance the important task

of safeguarding the health of students, staffs, and patients, while keeping a track of the changing environment and local or national policies, and at the same time, by ensuring that there is a continuity in the education of the students.⁹

One of the approach to manage such situation is the institute can divide its floor and area into four zones as given by School and hospital of Stomatology, Wuhan University, China.¹¹

1. *Yellow*: Triage or waiting area. Staff in the yellow area should wear disposable surgical mask, head cap, and work clothes.
2. *Orange*: The Dental clinic. Dental staff should be provided with PPE, including disposable N95 masks, gloves, gowns, head cap, shoe cover, and face shield or goggles. The area is to be disinfected once every half a day.
3. *Red*: The Isolation clinic. It is to be designed for patients who are suspected of COVID-19, those who are recovering from COVID-19 (but less than 1 month after they are discharged from hospital), or those who need dental procedures producing droplets and/or aerosols. There should be separate entrances for the patients and the staff. The entire isolation area should be disinfected immediately after the treatment is over and the patient has left the clinic.
4. *Green*: Resting area for staff only.

The options are continually advancing but it may include consolidating and moving the clinical didactic sessions online at the earliest to allow for later entry into the clinical environment; by

creating and using available virtual cases; and modifying the academic calendar to exchange later experiences (eg, their scholarly work) and defer the clinical rotations; and involve students in the tele-health environment.¹² In addition, the psychological fear due to COVID-19 can be reduced, for example, seminars on COVID-19 could be included in the distance learning experience to facilitate open discussion and address anxiety among faculty and students. Since many dental institutions are operating differently due to the current pandemic, this could be an useful opportunity for the management to invest in online training for lecturers, so that they could create online modules for their courses in the future.¹³

The Role of Simulation in Dental Education

Due to a high risk of recent COVID-19 transmission in dental clinics and hospitals, alternative modes of teaching have been explored. Simulation exercises are one of the safest forms of clinical skills practice without the need for physical presence in a clinical environment and direct contact with patients.¹⁴ Simulations has also been used to facilitate the transition into a dental hospital and enhance a student's preclinical knowledge through inclusion of a wide range of simulated patient scenarios and exercises.¹⁵ The recent advancement in virtual reality (VR) simulation technology brings a wide range of opportunities for education in dental institutions. It provides both the students and the staff with an integrated on-screen feedback on the performance of the trainee which is continuous.¹⁶ The promotion of the recent haptic technology has equipped the VR



Fig. 1: Dental setup with divisions to manage COVID 19.

simulators with the ability of tactile feedback which makes it possible for the trainees to touch and feel the virtual tooth tissue. There is evidence suggesting that use of VR technology has improved the rate of skill acquisition in conservative dentistry modules that are taught in undergraduate dental programs.¹⁷ It improves the student's fine motor skills, hand-eye coordination and reflection skills and becomes especially more effective in the very early stages of skill acquisition leading to a conservative approach and better retention of skills.¹⁸ Thus, its use possibly with some modifications to allow distance learning can be considered during the pandemic.

What Covid-19 Taught Us?

This unprecedented period is encouraging innovation and imagination. There is a big uncertainty regarding how long this situation would persist and increasing wide recognition that there may be periods in the near future after reengagement in a 'new normal' environment, in which social distancing and quarantines may be required again.¹²

COVID-19 is a unique challenge for the dental profession due to the nature of the work environment, where high aerosols and droplets are generated during routine procedures.¹¹ Dental professionals must keep themselves up-to-date regarding this evolving disease and also provide adequate training to their staff and postgraduates to promote many levels of screening and preventive measures, allowing dental treatment to be provided while mitigating the spread of this novel infection¹⁹.

The observations and evaluation of the current situation suggest that the costs of providing dental treatment may increase in the future because of several reasons including the need for additional resources such as PPE, dental practice modifications and increased waiting times due to the need for segregation of patients in the waiting areas resulting in a reduced number of patients that can be seen daily. It is also assumed that there could be a surge in the demands for e-consultations in the near future.

However, the current pause on conventional educational activities creates an opportunity for alternative formats of teaching to be tested and improved, and it will encourage more creativity amongst education providers resulting in introduction of novel means for clinical and face to face teaching.¹⁰

What Does The Future Hold?

On 14 May 2020, the executive director of the

WHO's health emergencies program stated that there is a chance that the novel coronavirus can never be eradicated as the HIV has not been yet.

The dental education environment is cross-generational. The former mindset that doctors would work when they were ill was considered to be altruistic and professional, with prioritisation of the patient above the doctor. However, the situation that this pandemic represents is different. Professionals who come to work while they are considered ill, as well as those who may be free of symptoms and are silently incubating the virus, might facilitate transmitting the virus to others. Hence, the culture of professionalism and altruism must be redefined and taken into consideration the possible effects of potential actions, even with good intentions.

Additional academic issues that are not known will require attention, including standardised examinations when testing center are closed, the timeline for residency applications, and the ability to meet requirements for certain subspecialties prior to applying to residency.

Recommendations for Dental Institutions

On the basis of our experience with nCoV, we provide a few recommendations for dental education as it is important to consider the following points in the long term:

1. Clear policies and protocols should be conveyed to the faculty, so there is no confusion with regard to expectations and responsibilities. Dental educators and researchers must follow regulations and guidelines announced by their local authorities and institutions as how to operate post COVID 19 outbreak.
2. Faculty should hold meetings to reprioritise goals, reorganise course materials, and obtain training on remote teaching. Special considerations should be given to female faculty and staff and families with young children due to lack of child-care options.
3. Online webinars, lectures, case discussions, and problem-based learning tutorials should be adopted to avoid unnecessary aggregation of students and associated risk of infection. However, studies²⁰ have proven that prolonged usage of gadgets could result in computer vision syndrome, therefore the institutions should set a time frame to stop posing a natural 'break' from the previous activity.

4. It is worth advocating to encourage our students to engage in self-learning, to make maximum use of online resources, and learn about recent academic developments. And also, the dental educators should get feedback from the students and modify the teaching methods accordingly.
5. The college administration can offer psychological counselling for students to cope with the situation. Attendance and grading policies and submission of assignments should be modified to reduce anxiety among the students. Open communication among students, staffs, and administration would enhance mutual trust and facilitate adequate cooperation
6. VR simulation technology could be a useful additional tool to conventional dental training approaches, and its effective and safe use can be considered during the pandemic.
7. Professionals must be constantly aware and be able to overcome the infectious threats that may challenge the current infection control regimen.

Conclusion

In conclusion, COVID-19 pandemic has had many immediate complications in the field of dentistry, of which few may have further long-term impacts on dental education. The students and faculty can help document and analyse the effects of current changes to learn and apply new principles and practices to the future. This period is not only a time to contribute ourselves to the advancement of dental education by the setting of active curricular transformation and innovation, but it may also be a seminal moment for many disciplines in dentistry.

In the present time, humanity has realised that we are powerless against a tiny-speck of nature and that we have limited options for treating life-threatening zoonotic coronavirus infections. But hope dominates all other human emotions and we strongly hope that very soon mankind is able to bring this pandemic under control.

References

1. WHO director general's remarks on 2019-nCoV available at <https://www.who.int/dg/speeches/detail/who-director-general-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020> [cited 2020 aug 03].
2. Staff. Outbreak: 10 of the Worst Pandemics in History; 2020. Available at [https:// www.mphonline.org/worst-pandemics-in-history](https://www.mphonline.org/worst-pandemics-in-history). [cited 2020 sept 02].
3. Jacobsen KH. Will COVID-19 generate global preparedness? *Lancet*. 2020;395:1013.
4. Ministry of health and family welfare on COVID 19. Available at <https://www.mohfw.gov.in>. [cited 2020 sept 03].
5. Prati C, Pelliccioni A, Sambri V, Chersoni S, Gandolfi MG. COVID-19: its impact on dental schools in Italy, clinical problems in endodontic therapy and general considerations. *International Endodontic Journal*. 2020;53:723-725.
6. Park SW, Jang HW, Choe YH, et al. Avoiding student infection during a Middle East respiratory syndrome (MERS) outbreak: A single medical school experience. *Korean J. Med. Educ*. 2016; 28:209–217.
7. Rose S. Medical student education in the time of COVID-19. *J American Med Assoc*. 2020;323(21):2131-32.
8. Accreditation standards for dental education programs. American Dental Association. Available at https://www.ada.org/~media/CODA/Files/Predoc_Standards_July2020.pdf. [cited 2020 sept 04].
9. Iyer P, Aziz K, Ojcius DM. Impact of COVID-19 on dental education in the United States. *J Dent Educ*. 2020;1-5.
10. Barabari P, Moharamzadeh K. Novel Coronavirus (COVID 19) and Dentistry - A Comprehensive Review of Literature. *Dent. J*. 2020; 8:53.
11. Meng L, Hua F, Bian Z. Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine *J of Dent Res* 2020; 00(0):1-7.
12. COVID-19 updates and resources. Liaison Committee on Medical Education. Updated March 25, 2020. Available at [https:// lcme.org/covid-19/](https://lcme.org/covid-19/) [cited 2020 sept 04].
13. Turkyilmaz I, Hariri NH, Jahangiri L. Student's perception of the impact of E-learning on dental education. *J Contemp Dent Pract*. 2019;20(5):616-621.
14. Ferguson M.B, Sobel M, Niederman, R. Preclinical restorative training. *J Dent Educ*. 2002;66:1159-1162.
15. Hollis W, Darnell LA, Hottel TL. Computer assisted learning: A new paradigm in dental education. *J Tenn Dent Assoc*. 2011;91:14-18.
16. Scalese RJ, Obeso VT, Issenberg SB. Simulation technology for skills training and competency assessment in medical education. *J Gen Intern Med*. 2008;23:46-49.

17. Buchanan JA. Use of simulation technology in dental education. *J Dent Educ.* 2001;65:1225-1231.
 18. Al-Saud LM, Mushtaq F, Allsop MJ, et al. Feedback and motor skill acquisition using a haptic dental simulator. *Eur J Dent Educ.* 2017;21:240-247.
 19. Amber A, Ruparel NB, Diogenes A, Hargreaves KM. Coronavirus Disease 19 (COVID-19): Implications for Clinical Dental Care. *Journal of Endodontics.* 2020;46(5):P584-595.
 20. Wang DE, Awad JD, Yee RW. Computer vision syndrome. *Ocular surface disorders.* JP Medical LTD. London. 2013:125-31.
-