



Review Article

Facing challenges of COVID-19 on dental education in Sri Lanka

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ABSTRACT

Second wave of COVID 19 pandemic in Sri Lanka has given rise to multiple challenges in all the sectors and higher education is not spared. Even though there are multiple challenges in effective delivery of education, Faculty of Dental Sciences, University of Peradeniya being the only institute providing undergraduate dental education in Sri Lanka and operated totally free of charge for students has also taken important steps to face the emerging challenges and make timely modifications to teaching and learning methods to ensure the undergraduates achieve the required competency levels without unwarranted risk. As a major change, effectiveness of tele-dentistry has been recognized. COVID-19 pandemic has demonstrated that there is a severe underutilization of e-learning as an educational tool and the issues with technology and lack of facilities. It has created an environment for all of us to see the dental education in a different perspective and to identify the need for a transformation.

It is obvious that the way we practice dentistry and deliver dental education has significantly changed as a result of the COVID-19 pandemic and became a major challenge for us as the dental education in the country is provided free of charge and with limited resources. This opportunity is to be used to review clinical practices including safety measures, dental curricula, teaching and assessment tools to serve the next generation of patients and dentists. Practicing dentistry in pandemics of this nature should undoubtedly be part of the dental education in the future.

Keywords: Covid-19; dental education; pandemic; Sri Lanka

1 BACKGROUND

The COVID-19 pandemic, also known as the corona virus pandemic is an ongoing global pandemic of corona virus disease 2019 (COVID-19), caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2).⁽¹⁾ As of 9th August 2020, more than 19.4 million cases of COVID-19 have been reported in more than 188 countries and territories, leading to more than 721000 deaths; and more than 8.75 million recoveries.⁽²⁾ During the current pandemic, the Occupational Safety and Health Administration (OSHA, gov) classified dentists in the very-high risk category owing to potential exposure to corona virus through aerosol-generating procedures. Recent studies suggesting COVID-19 may be airborne through aerosols formed during medical procedures or indirectly through saliva have also been published.^(3,4) In this milieu, being the only education

institute which provides undergraduate and postgraduate dental education entirely free of charge and located in a developing country with limited resources, what measures are taken by the only dental school in the country to ensure the continuity of education while safeguarding students, staff and the patients? How prepared are we to face the emerging challenges and make timely modifications to teaching and learning methods to ensure the undergraduates achieve the required competency levels without unwarranted risk? This paper discusses the measures already adopted by the institution and offers realistic recommendations to combat the prevailing pandemic and be better prepared for future disruptions of similar nature.

1.1 Challenges imposed on faculty administration

University of Peradeniya is the largest residential state university in the country and being the one and only dental school for the entire country, Faculty of Dental Sciences is the sole contributor for the undergraduate dental education in Sri Lanka. Dental hospital Peradeniya maintained by the Faculty of Dental Sciences houses the well-organized specialized clinics, theatre, ward and outpatient department in order to provide the clinical training required. In addition, the faculty plays a key role in providing postgraduate dental education and is responsible for training dental auxiliaries. Faculty also provides human and other resources in maintaining in service and skills and knowledge enhancement programmes for practicing dental surgeons and dental technical categories.

As the pandemic hit the country in March, University Grants Commission which is the responsible authority for the higher education in Sri Lanka decided to close all universities to prevent the spread of infection among the university students and staff. It was considered a vital decision especially for University of Peradeniya where over 5000 undergraduates reside in the hostels maintained by the university itself. One of the biggest challenges faced by the administration is the sense of uncertainty which makes it very difficult to plan the academic programme. Administration is bound to safe guard the staff, students and the patients in addition to comply with government regulations and policies which have been changing on a regular basis. When the measures were taken to reopen the universities, the government policy was to prioritize the examinations for final year students in all the universities and to gradually open up the academic programmes at each faculty. The unique nature of the dental education is that a substantial part of the training is based on skill development procedures. Thus reopening of the faculty for the students especially for those who are in the latter part of the programme was a challenge which is kind of contradiction to the government policy. Maintaining the continuity of the academic programme is an absolute necessity unless the faculty and the country want to face different sets of problems all together which will affect intake of new students, graduation, intern appointments, overseas training of post graduates and appointments of dental auxiliaries and specialists. Moreover, additional cost incurred by the demand for PPE and improvement of infrastructure to be par with health guidelines imposes a financial burden for the administration. Considering the nature of the care provided by the state hospitals which is entirely free for the public, the additional burden can impose limitations to the range of procedures that can be offered for the patients.

In addition to current issues, long term problems related to new recruitment of both students and staff, extension of assignments, promotions are expected to be affected.

1.2 Challenges in Teaching and Learning

1.2.1. Undergraduate teaching-theoretical knowledge

During COVID-19 pandemic, educational delivery methods have been revolutionized. Didactic courses, hands-on workshops, presentations and seminars have transitioned to online instructions in most institutions.⁽⁵⁾ Adapting to these changes in the curriculum and evaluation methods in a short period of time was a challenge to the academics. Many dental faculties in North America have changed to an online curriculum with the help of teleconference and file sharing platforms to deliver virtual lectures, facilitate group discussions and thereby promote students' engagement.⁽⁵⁾ After a break, UGC decided to continue the university education via online teaching mode which resulted in completion of theory knowledge to a greater extent. Although the faculty possesses a personal e-learning platform, before the pandemic, this had been utilized as a supplementary along with the traditional didactic teaching. When the students were forced to stay at home it was necessary to manage the uncertainty and the anxiety of both the students and the parents and to keep the students engaged and motivated to continue learning. Since the faculty absorbs students from all over the country it was necessary to assess the access and feasibility of online teaching before delivery of any teaching material. The survey undertaken regarding the access and tools available revealed all the students had access to online teaching. Administration organized a zoom meeting for the students of each semester with the semester and course coordinators and enlightened the students on how this would be delivered. Online lecture schedules were prepared for each semester (1st, 3rd, 5th and 7th semester) and lectures were delivered through Dent Moodle-Faculty platform for e-learning. It was a novel experience for both the students and the teachers. Although there was some confrontation from the academics regarding preparation time and lack of technical assistance, many complied with the plan. By the end of July more than 90% of the lectures were completed for each semester.

Moodle platforms are extensively used by dental schools for active learning activities.⁽⁶⁾ In the Sri Lankan context, students' feedback regarding online delivery of teaching materials during COVID-19 had been extremely satisfactory as shown by student-teacher group in WhatsApp. It was demonstrated in the previous studies that the students generally have positive impressions despite technical problems and related stresses.⁽⁷⁾ In spite of these new adaptations focused on educational matters, there is little evidence regarding the actual impact of these media platforms on students' acquisition and retention of knowledge. Studies have highlighted the successful experiences in isolated dental specialties.⁽⁸⁾ While these platforms are advantageous because they are already structured and universal in nature, they require further improvements and constant maintenance. Students' access and the quality of internet

connection is also a concern.

1.2.2. Undergraduate teaching -skill development

According to the recent changes made in the undergraduate dental curriculum, students start stimulatory lab work in the first year. They initiate their clinical training as early as in the 3rd semester. However a sufficient amount of face-to-face practical hours with simulation models or clinical training on real patients is no longer a valid option for the acquisition of skills and manual skills. The progress of practical activities should undoubtedly be postponed and wait until the quarantine state is ceased in each country and education can return to normalcy as pointed out by Alzahrani et al. 2020.⁽⁹⁾

The biggest challenge the faculty would face is to postpone direct patient contact which is considered a key element in the development of skill competencies. Although different clinical dental care simulators have been developed and yielded satisfying results, they are insufficient in educational institutions, are not portable, do not cover all areas of dentistry and are very expensive and unaffordable in large scale.^(10,11) Even though the faculty already possess limited number of procedural videos on laboratory and clinical procedures and simulators for CPR, they do not cover all the disciplines, and they cannot reinstate the experience obtained by handling actual patients. While these may be useful in pre and para clinical years for the initial phase of skill development, experience with the patients would be mandatory during the latter phase. Thus, it was necessary to have a plan to commence the clinical training at least for non-aerosol generating procedures first and then slowly progress towards aerosol generating procedures.

There should be a plan to purchase adequate number of PPE both for the patients and the staff members. In order to return to clinical activities, major investments must be made in dental school clinics to adapt to new safety guidelines of the post pandemic period.⁽¹²⁾ When the faculty conditions were explored, there had been recommendations on how the ventilation and airflow can be improved both in the clinical environment and the lecture theatre to ensure safety of students, staff and the patients. Cost effective means of introducing these changes were sought by the administration to ensure that the investment is affordable. There have been discussions at the faculty level with staff and the administrators in order to explore maintenance of continuous air flow to the clinical premises such as use of exhausting fans, industrial fans and separation of cubicles of dental units with partition up to the ceiling level. Assessment of those changes by a technical expert was also discussed.

1.2.3. Clinical training

Clinical teaching in dentistry is more challenging than all other disciplines including that of medicine. During this period clinical work in dental hospitals all over the world was

mainly carried out by the staff whereas in some institutions postgraduates were involved. However, involvement of the undergraduate students was mainly limited to non-clinical activities.⁽¹³⁾ This was due to multiple reasons; dental students were considered as a vulnerable group as the dental procedures are high risk, dental treatment were listed as limited to emergency treatment by the government and professional associations (SLDA), there was a shortage of personal protective equipment and finally there was a lack of knowledge regarding management of the patients in the pandemic. Most of the dental academics had relied on multiple sources including literature or local standardized protocols but national guidelines or directives were the main source for majority.⁽¹³⁾

In Australia, a staged approach had been adopted with professional dentists followed by UG students.⁽¹⁴⁾ Sri Lanka practiced a similar move with the clinical staff first and followed by PG students, final year students for examination and clinical training for the 7th semester students was scheduled to commence on 10th August 2020.

It is essential to identify the ways to minimize the impact of lack of clinical training while maintaining the required standards of dental education. Some European dental schools are planning to modify their examination timetables or extend program dates to maintain the required clinical hours without reducing the clinical graduation requirements.⁽¹³⁾ It is essential for us to plan and modify our curricula, facilities for clinical training while providing the optimum protection for the students, staff and patients and proper guidelines and protocols for infection control and management of occupational hazards. Having extra treatment sessions which ensure adequate social distancing, limiting number of patients per cubicle are some of the things that can be practiced.

1.2.4. Postgraduate teaching

Most of the postgraduate dental education activities were ceased during early parts of the pandemic. Involvement of the postgraduate students in managing the patients except OMF surgery trainees was scarce. Association of Dental Education in Europe (ADEE) has conducted a survey among its member and non-member dental schools. Involvement of postgraduate students in clinical work in dental hospitals was 30%.⁽¹³⁾ Although this was found to be minimal in our set up. In a way, postgraduates missed an opportunity to work under a different and challenging environment while safeguarding the health of them, members of the dental team, their patients and public. There were multiple online discussions and webinars in different disciplines for the benefit of postgraduates. Examinations and assessments were postponed resulting in a delay in completion of the programs.

1.2.5. Students' examinations

The lockdown has resulted in postponement of examinations in many dental schools whereas some dental schools had their examinations entirely online.⁽¹³⁾ In Sri Lanka, undergraduate students already have had their end semester examinations. However the faculty had final year dental undergraduates who were following the old curriculum having their exams when the universities were closed. The first priority of the faculty was to complete the examination for this group of students. They had to finish clinical/practical components. When the country was reopened it was decided to conduct the examination for all the final year students abide by the guidelines issued by the Ministry of Health and the institutional infection control committee. The preparation for the examination for the final year students with few students in one clinic was considered as a try-in attempt for adjustment into the changes in the clinical set up. A WhatsApp group was created between students and staff and guidelines related to examination procedures were shared among the students. An orientation programme with demonstration and discussion on wearing PPE was carried out one day before the commencement of examination. Students spent two weeks self-quarantine in the halls of residencies with one student per room. It was possible to get down the students and the patients after a triage to examination set up while maintaining social distance. All the students, examiners and the supporting staff were provided with necessary PPE. All the procedures undertaken were non-aerosol generating. For the Restorative Dentistry practical, adequate social distancing was maintained in the simulatory lab and the procedures were completed on manikins. Students were also followed up for two weeks after returning to home to identify any health issue.

Since the training programme, is disrupted it was necessary to reschedule the academic programme and postpone examinations. These include undergraduate, postgraduate, dental auxiliary and licensing examinations.

Conducting clinical competence assessment is a serious issue of concern. There is no way that we can conduct them in the same way as we used to do in the past. There had been many practical changes in different institutions such as clinical reasoning exercises, case presentation narratives and self-reflection activities based on portfolios/log diaries.⁽¹³⁾ Examination format may have to be modified to exclude direct patient contact. Examination tools already being used such as OSCEs should be encouraged in place of long cases and short cases involving direct patient contact. Possibility of using Virtual Patient (VP) both during learning and examination should be explored. While it is possible to assess the analytical and decision making skill of the students by this method it would be of no value in assessing the actual hand skill of the operator, a fact we would have to accept if the pandemic continues.

1.2.6. Effect on the students' community and staff

Dental students are with acceptable level of general knowledge about COVID-19, but dental faculties need to take appropriate measures to address gaps in knowledge and control measures and perceptions to ensure a safer return to clinical activities.⁽¹⁵⁾ Confusion and uncertainty regarding the infectivity need for social distancing and isolation, need for PPE use, strict infection control guidelines and protocols and uncertainties about the outcome of the pandemic can significantly affect psychology of the students and members of the staff.

Concern about the delay in completing the program and graduation is an additional issue for students.⁽¹⁶⁾ Issues on patient management, supply and rational use of PPE, providing appropriate training for the students, getting adopted to newer teaching and assessment methods can result in anxiety, predisposing people to depression and post-traumatic stress disorders.⁽¹⁷⁾ It is important to recognize this fact and to take necessary corrective actions. Organizing stress relieving activities and social gatherings while maintaining infection control guidelines are an option.

1.2.7. Effect on patient care

Dental treatment was restricted aiming at protecting dental healthcare personnel, their families and their patients from transmission of the virus and also to preserve the much-needed supplies of personal protective equipment (PPE). Dental practices including the University Dental Hospital had to limit their services to essential and emergency procedures.

In the Dental hospital, Peradeniya, the reception area was relocated ensuring social distancing. A pre-entry checkpoint was created for all patients, staff and students entering the premises. This was the level 1 screening. At level 2, travel and COVID-19 history was taken along with the main complaint and the patients were directed to the respective clinics.

During the pandemic, contacting the patients via telephone or video has been recommended for patient triaging.⁽¹⁸⁾ Telemedicine has been identified as a useful method in managing the patients, especially the patients with oral cancer during this difficult time period.⁽¹⁹⁾ Tele dentistry consultations have been used as an effective modality to reduce the need for in-person consultations.⁽⁵⁾ Faculty of Dental sciences also adopted over the phone consultations as well as tele-dentistry using social media platforms. Social media platforms have been identified as easy and reliable method with good patient acceptance.⁽²⁰⁾ This had been very effective in terms of reducing the number of patients attending for routine check-ups and trivial complaints which are non-urgent in nature.

As all elective dental treatment procedures were postponed, we can expect to see many complications in the future when the situation allows the patients to come for treatment. Due to the COVID-19 lockdown situation, number of new

cancer and OPMDs patients attended to the dental hospital was very low due to fear of acquiring COVID-19 infection while traveling as well from the hospital which is declared as a high risk place. Majority of the patients with OPMDs or oral cancer do not experience pain or difficulties and therefore they don't see it as an urgent reason for them to attend the clinic. We have observed many new patients presenting with late cancers to the hospital. They have noticed the lesion weeks or months before but were not in a position to attend the hospital due to the lockdown or fear of contacting Covid-19. Moreover, OPMD patients with a high risk for malignant transformation who did not attend to the hospital for management during the lockdown period started presenting to the hospital with malignant transformation.

1.2.8. Positive outcomes

COVID-19 pandemic will have a serious effect on dental education in Sri Lanka. Findings of the ADEE survey suggests that 90% dental schools expect a change the way in which public health education plays a role in dental education whereas 66% expect a change in the shape of the oral health workforce. There is an uncertainty on the long-term impact on clinical dental education.⁽¹³⁾

Emergence of the pandemic has also lead the academic/research staff to explore the paths of improving dental education, patient management practices and create an environment to conduct discussions on novel approach in the dental field.⁽²¹⁾

As there isn't any published data pertaining to delivery of overall theoretical content and its effectiveness online, the faculty has taken steps to conduct a study to explore the effectiveness of online e-learning and teaching experience of the undergraduate dental students. Unit for Development of Dental Education (UDDE) of the faculty also carried out a survey among undergraduates on their attitudes and use of online platforms. Outcomes will be considered for planning and improvement of the dental practices and education in the future. Some favorable aspects and difficulties associated with virtual teaching and learning, searching for available tools and techniques as well as new perspectives have been identified through research on these aspects.⁽¹²⁾

Even though there are multiple challenges in effective delivery of higher education to the dental students in Sri Lanka, it has provided some opportunities as well. Teleconsultation for patients in clinical practice and tele-education as effective alternatives to traditional teaching have been identified and considered useful to avoid dissemination of SARS-CoV-2 and more collateral damage.⁽²²⁾ Effectiveness of tele-dentistry has been recognized. COVID-19 pandemic has demonstrated that there is a severe underutilization of e-learning as an educational tool and the issues with technology and lack of facilities. It has created an environment for all of us to see the dental education

in a different perspective and to identify the need for a transformation.

Considering the world's new normal and reality, dental education can be continued where theoretical knowledge can be taught with e-learning effectively while addressing the students' unequal access to quality and financial difficulties faced by some students. We need to rethink the approaches taken by us in dental education and curriculum may have to be changed considering the new normal.⁽¹²⁾ Being the only dental faculty for the country, we need to work together with other higher educational institutions in the country as well as international dental education associations to formulate practical, cost effective and safe method to continue dental education. More research is urgently needed in this area. Challenge in continuing dental education in the COVID 19 pandemic era will be a greater challenge to the countries with limited resources. Administrators of higher education, academics and clinicians need evidence-based information to make informed decisions and therefore ongoing research is very much essential.⁽¹³⁾

2 CONCLUSION

It is obvious that the way we practice dentistry and deliver dental education has significantly changed as a result of the COVID-19 pandemic. This opportunity is to be used to review clinical practices including safety measures, dental curricula, teaching and assessment tools to serve the next generation of patients and dentists. Practicing dentistry in pandemics of this nature should undoubtedly be part of the dental education in the future.

Authors' declaration on previous publication

This manuscript has not been previously published and not under consideration in the same or substantially similar form in any other journal.

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