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Proceedings of the Brazilian Academy of Dentistry Sponsored Symposium on New Perspectives on Dental Education—9/24/2021

Brazilian Academy of Dentistry†

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To create a forum to facilitate further discussion, the Brazilian Academy of Dentistry organized an international symposium to discuss the experience of having to deal with dental education during the implementation of public health measures to mitigate the spread of SARS-CoV-2 in schools in Brazil, India, Portugal, Sweden, and the United States. An additional goal of the symposium was to discuss the need of continued faculty development. Therefore, the aim of this paper is to summarize these discussions.

Keywords: dental education, higher education, COVID-19, online and higher education, distance learner

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†In name of the Academy, Alexandre R. Vieira organized the text, with a contribution from Silvia A. Gonçalves. Mario Groisman, Rafael Arouca, Flavia Mendonça, Marcia Nana, and Liana L. Pinheiro organized the symposium

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INTRODUCTION

Virtual or online learning in dentistry has been suggested as an alternative or complementation to traditional in-person didactic activities due to the diversity of tools now available for online learning. One of the main drivers motivating the proponents of online learning in dentistry is an increasing worldwide shortage of clinical academics to teach dental clinicians in the future (Schönwetter et al., 2010). Concerns with the growing online content being developed for replacing in-person dental education have been voiced since individual learning styles and preferences vary considerably (Divaris et al., 2008) and the coronavirus disease 2019 pandemic precipitated the implementation of online dental education around the world. Generally positive outcomes have been reported in many countries, such as South Korea (Herr et al., 2021), Romania (Iurcov et al., 2021), Germany (Schlenz et al., 2020), Croatia (Badovinac et al., 2021), and Italy (Varvara et al., 2021), but less favorable impressions related to student's satisfaction in China (Wang et al., 2021), Turkey (Avunduk and Delikan, 2021), and Pakistan (Sarwar et al., 2020). The need for faculty development in Italy (Varvara et al., 2021) has also been reported, suggesting that a deeper discussion regarding the trend of moving at least some portion of dental education to an online environment is warranted.

GOAL OF THE SYMPOSIUM

To create a forum to facilitate further discussion, the Brazilian Academy of Dentistry organized an international symposium to discuss the experience of having to deal with dental education during the implementation of public health measures to mitigate the spread of SARS-CoV-2 in schools in Brazil, India, Portugal, Sweden, and the United States. An additional goal of the symposium was to

discuss the need of continued faculty development. Therefore, the aim of this paper is to summarize these discussions.

THE IMPACT OF COVID-19 ON DENTAL EDUCATION IN DISTINCT GEOGRAPHIC LOCATIONS

The aim of this discussion was to describe the implementation process done in Brazil, India, Portugal, Sweden, and the United States to continue to provide timely dental education. This section summarizes a reflection done by each speaker on what was the experience in each of their locations. It was expected that similarities and differences would emerge, despite the differences between countries and cultures. Three guiding questions were proposed for the panel and the summary of answers related to each country experience is included below.

1. How did the covid pandemic affect the undergraduate dental education?

In the United States, dental schools had clinics closed typically between March and June of 2020, and didactic teaching started to be delivered online from March on (Peres et al., 2020). Laboratory (pre-clinical) courses returned in June 2020 with clinical activities, following more strict protocols to mitigate risks of transmission. In-person didactic classes only returned in September 2021. These changes obviously impacted daily activities of schools and a decision was made that the dental school accreditation process, which is done by the Commission of Dental Accreditation (CODA) was postponed 1 year (for accreditation purposes, schools in the United States are evaluated every 7 years).

In Sweden the campus of Karolinska Institute went to lockdown in March 2020. All didactic activities started to be done remotely through a web-based platform. Course examinations, however, were done on site. Clinical activities were extended to the months of June and August. Resuming clinical activities included screening patients and observing use of personal protective equipment, physical distancing, and hand hygiene. At Malmö, the dental school was closed until the end of the spring semester and all clinical activities were canceled. All didactic activities were done remotely through a web-based platform. Examinations, both written and oral were done remotely. Small group discussions of clinical cases were introduced. Clinical activities were resumed in the Fall of 2020 and Spring 2021 observing physical distancing and personal protective equipment. Students started to work in pairs with a single patient. The clinical case-based discussions continue to be done to this day.

The experience at the campus of the Instituto Universitario Egas Moniz in Portugal was as follows. Activities stopped 9 March 2020, and the program was adapted in a week to begin social distancing (restarted virtually March 16). Clinical care was interrupted March 11 in the whole country. The school was already working on an online platform since 2019 for didactic purposes and the transition was less challenging. Final examinations for senior students were made more flexible. Traditional activities with the students (research week) were suspended.

In India, no treatments were offered, other than emergency treatments, with the introduction of updated safety guidelines. Dental schools closed around the country in March and stayed closed until October. Education was at least partially offered online and there was no clinical exposure in the meantime.

In Brazil, in the case of one private school, the didactic program was offered virtually starting March 16 (4 days after the decision of interrupting in-person activities) and clinical care was interrupted, returning August 2. September 14 marked the return of in-person activities with graduation on December 18. The graduating class did not miss any content hour. 2021 restarted as planned originally with in-person activities, with the option for didactic learning done virtually until the second semester when all activities returned to be in-person. This experience was not in line with most schools in Brazil (Peres et al., 2020), which had clinical activities interrupted for more than 1 year, and in many instances, only a portion of didactic courses being offered online.

2. What adjustments were made to maintain clinical, scientific, and educational activities at the undergraduate dental school?

In the case of the University of Pittsburgh School of Dental Medicine in the United States, didactic teaching (live and recorded lectures) were resumed after 1 week of interruption. Exams were done remotely with an emphasis on the honor code. Pre-clinical teaching resumed after 3 months with virtual demonstrations. Clinical activities also resumed after 3 months, with adapted clinical protocols and masks were worn by each student, clinical staff, and faculty. Case discussions were introduced and while waiting for the return, students were offered access to professional-level courses (continued education credits).

In Sweden, the Karolinska Institute had in-person activities limiting the number of people involved, both in the clinics and pre-clinics, and groups were smaller than usual. At Mälmo, they did not relax the requirements originally described in course syllabi. That meant some activities were postponed to the following semester but never canceled. It was observed that teaching materials developed for remote activities were improved and had better quality and content.

Students and faculty regret that final examinations and graduation could not be done in person ("that was no closure").

In Portugal, activities restarted 11 May at the campus of the Instituto Universitario Egas Moniz, with pre-clinical activities, and 25 May clinical care returned. Video tutorials were created to orient students for clinical activities. New protocols for personal protective equipment use were introduced. Individuals were pre-screened before entering facilities. Students used to work in pairs, started to work in trios. Spacing in the clinics was enforced, and final exams were postponed 1 month (from June to July). Exams were done virtually (online).

In India, online lectures were improved overtime to make content more attractive and problem-based learning strategies

were used more often. Special attention to content was given and return to lecture halls happened while keeping physical distancing.

In Brazil, the experience of one private school was that they returned the clinical activities with safety protocols in place. Didactic videos were created to orient students for their return to the clinics. In-house physical barriers were utilized (Montalli et al., 2020, 2021). Few cases of covid were recorded.

There was an emphasis on faculty development for more effectively using online tools. It was also identified a need for expanding emotional support for students.

3. Which evaluations can be made on the results of these adjustments, that influenced the quality achieved in professional training in Dentistry?

At the University of Pittsburgh School of Dental Medicine, like the other schools in the country, the fourth-year class graduated successfully, with students completing for the most part their requirements. There was no record of a single case of COVID-19 transmitted in the clinics. The incoming class was also recruited successfully, suggesting the disruptions due to COVID-19 had little to no impact. There was, however, a detectable impact on students. Some selective courses were not offered and there were less clinical chairs being used due to protocols of physical distancing. Anxiety was reported due to the concern of the possibility of not graduating on time, being not competent to practice at the time of graduation, the ever-changing safety protocols, low numbers of new patients, and the fear of contracting the disease were sources of stress. There was a perception that the didactic experience was better than anticipated, while some students may have had less clinical experiences and a higher than usual number of students had to complete requirements over the summer after the end of the term.

Clinical production was improved because students started to work faster and at-four hands. Overall, online didactic courses were well-received and clinical experiences were offered, but there was a toll on the students. There was a general sense that faculty and staff were for the most part helpful and accommodating. Changes forced the school to be more efficient and there was an increase in clinical revenue.

In Sweden, management was forced to reflect on how course material was offered and discussions with student representatives were ongoing. In general, students appeared to be satisfied with their learning experience. Faculty and staff have worked hard to promote the best experience possible for the teaching. An evaluation of examination results in the Spring is planned to try to identify the presence of any gaps in knowledge that may need to be addressed. For now, no evidence of any gaps was unveiled.

In Portugal, the school leadership was able to react promptly, and faculty, students, and staff were willing to accommodate to the new reality. There was already experience with using virtual tools and it was possible to continue with the teaching program without interruptions. Clinical activities returned promptly with revised safety protocols and very few cases of covid were recorded in the clinics.

In India, a recommendation of psychomotor training online with incorporation of self-assessment protocols was made. Self-assessment protocols appeared to be well accepted by teachers and students and were used.

In Brazil, the one private school incentivized the visualization of video didactic tools before coming to pre-clinical activities to improve performance started to be made. It was proposed a bigger emphasis from now on in implementing protocols for evaluations of teaching effectiveness. Faculty felt their positions were safe and that they received support in using teaching technology, particularly for course evaluations, which were thought to be the most challenging. The admissions process to dental school was done virtually and successfully completed.

ADDITIONAL REMARKS

It was a major undertaken for faculty everywhere to become quickly familiar with online educational tools, so didactic content would continue to be offered while lockdowns were being implemented. It was hard for students as well, which although typically comfortable with technology, were not used to have large portions of content delivered online only. However, it was still not possible to provide the typical clinical experiences to allow students to fully apply the knowledge gained from the didactic course work. The perception from students was that they were not fully prepared to start treating patients in their school settings. It can be assumed that in many cases, students who were later in their training had their education handicapped.

It is likely that continuing education programs will have to supply some of that lost experiences for the recently graduated professionals. Overall, it appears to be true that continuing education needs to be a requirement for everyone throughout their careers.

After what happened between March 2020 and the beginning of 2021, it begs the question if online learning really worked.

Initially, teachers not familiar with online teaching having to use online platforms led to student disinterest in addition to higher levels of faculty frustration and stress. It was not uncommon the perception that faculty development and support was not widely offered. Online teaching requires training and appears better suited for a supporting teaching tool, or a tool to be used for training of individuals in remote areas.

The concern exists that the popularization of online teaching precipitated by COVID-19 may be used as justification for replacing in-person learning in dentistry. However, it appears that demand exists for remote learning, particularly from recently graduated professionals.

Every minute, 70 min of online content is posted at YouTube. That means that vast amount of information and disinformation are made available on a variety of topics. The consequence is figures such as 7% of Brazilians believing the Earth is flat, despite of the evidence that exists it is round. The way the message is conveyed by the "digital influencers" rather than the actual truth has become more important. This translates to dental education by the need to emphasize the ability to understand content, and critically think about it. Content offered online, at

the enclosed educational environment of a school, or in the open area of social media, should follow the same ethical principles and portray best evidence and best practices. Education should be more than informative, it should be transformative. Online tools allow for dissemination of information, but a question exists if they can be transformative. According to Paulo Freire, a worldwide recognized Brazilian educator (Díaz, 1921–1997), "education does not change the world. Education changes people. People change the world."

In summary, remote, or online education is not a substitute for in-person education. This period of public health measures against COVID-19 also suggested dental school programs may be revisited for content and delivery methods.

INFORMATION INCLUDED IN RESPONSE TO PEER-REVIEW OF THE MANUSCRIPT

Presenters described their experiences mostly at their home institutions, in which they are mostly familiar. The presenter from India chose rather to address the three posed questions without focusing in any particular institution. For the United States, the experience at the University of Pittsburgh School of Dental Medicine was described. The University of Pittsburgh School of Dental Medicine is one of the four dental schools in Pennsylvania, and 1 of the 66 dental schools in the United States. It admits 80 students every year and serves the western part of the state, which is located in the Appalachian region, one of the areas with the worse health outcomes in the United States (Vieira et al., 2015). For Sweden, the speaker contrasted two dental schools, Karolisnka Institute and Mälmo University, out of the four in the country. Sweden is considered a wealthy and very modern country and has just under 10 million inhabitants and most people are concentrated in the south of the country. For Portugal, the experience at Instituto Universitario Egas Moniz was discussed. Located just outside Lisbon, the Instituto Universitario Egas Moniz is one of the seven dental programs in the country and is relatively young, created with the goal of integrating with the local community. Finally, for Brazil, the experience at Faculdade de Odontologia São Leopoldo Mandic was presented. Located in Campinas, in the state of São Paulo, the school is one of the more than 500 dental schools in Brazil. The dental curriculum in the different countries is expected to be similar, and one of the main differences between these countries is the pre-requisites to be accepted in dental school. In the United States, it is required a bachelor's degree in arts, sciences or both, whereas the other countries will not have this requirement. Hence, dental students in the United States are slightly older on average than dental students in other parts of the world. Also, the United States has in place an accreditation process that each dental school needs to undergo every 7 years to remain in activity. Conversely, Brazil has no oversight for its dental education programs and there is great variation on the quality of the education provided (Vieira and Castro, 2022).

It is assumed that the forced interruptions of the training during the surges of COVID-19 cases in the different countries have impacted all of them equally, with students having graduated having had less clinical experience than their peers of prior years, even if most of the planned course content was given.

AUTHOR CONTRIBUTIONS

Brazilian Academy of Dentistry confirms being the sole contributor of this work and has approved it for publication.

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The symposium New Perspectives in Dental Education was designed by Mario Groisman and happened virtually 24 September 2021. Presenters included AV discussing the experience at the University of Pittsburgh, School of Dental Medicine, United States, Björn Klinge discussing the experiences at Karolisnka Institute and Mälmo University, Sweden, Gil Alcoforado discussing the experience at Instituto Universitario Egas Moniz, Portugal, Pawar Mansing discussing the experiences in India, and Rui Brito discussing the experience at Faculdade de Odontologia São Leopoldo Mandic. In addition, Silvia A. Gonçalves provided an overview on the need for continued education. Additional speakers were Andre Kimura, Marcelo Fonseca, Sérgio Kahn, and Raphael Monte Alto.

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