

# Adapting to Change: The Impact of COVID-19 on Dental Education and Its Future

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H Pillay<sup>1</sup>, R Moodley<sup>2</sup>

## ABSTRACT

### Introduction

The COVID-19 pandemic significantly impacted dental education and resulted in unprecedented curricular changes. While virtual teaching enabled theoretical content delivery, practical training was temporarily postponed. Upon resumption, innovative approaches were required to safeguard students, staff and patients.

### Aims and objectives

This study aimed to provide a comprehensive overview of COVID-19's impact on dental education at a South African institution. The objectives were to explore the resultant changes, staff and students' experiences in adapting to the implemented changes, the opportunities for innovation and growth that emerged in response to the pandemic, and the potential long-term implications of these changes for dental education.

### Methods

A qualitative study was conducted. The 2021 and 2022 final year Dental Therapy students were invited to participate in separate, virtual focus group discussions. In 2022, all 12 academic staff members were invited to participate in individual interviews. Among others, participants responded to structured questions regarding pandemic-related changes and how they adapted. Data were audio-recorded with consent, transcribed verbatim and thematically analysed.

### Results

Study participants included eight staff members and two groups of six students. Four pandemic-related themes were identified, namely the sudden shift to online learning and

virtual communication, safety protocols, students' wellbeing and long-term implications. Among other findings, home-based learning posed opportunities and challenges for students. Furthermore, the 2021 cohort reported concerns regarding limited clinical training.

### Conclusion

The knowledge acquired by institutions during the pandemic must serve as a foundation for future curricular disruptions. This may be achieved through consultation between institutions and dissemination of information.

## INTRODUCTION

The COVID-19 pandemic significantly impacted dentistry and dental education, including the delivery. The sudden and extensive outbreak of the virus forced countries across the globe to instate national lockdowns, a period in which local and international travel was restricted, in an effort to reduce its transmission.<sup>1</sup> Although this resulted in widespread closure of institutions,<sup>2</sup> curricular disruptions were minimised through virtual teaching and communication aids such as video conferencing and online discussion platforms.<sup>3</sup> During this time, staff and students engaged in home-based teaching and learning, and were expected to suddenly adapt to these newly-implemented methods.

Upon resuming in-person training, dental schools quickly adapted to new infection control protocols and implemented curricular changes that would ensure the safe and effective delivery of dental education.<sup>1,4</sup> These pandemic-related changes comply with the resilience educational model which will be further elaborated on in this article. This study thus aimed to provide a comprehensive overview of the impact of COVID-19 on dental education at a South African institution. This paper contributes to the broader conversation on the effects of COVID-19 on dental education. It also provides insights for dental educators and administrators as they navigate the ongoing challenges posed by the pandemic and work to ensure the continued delivery of high-quality dental education.

## METHODOLOGY

### Research setting and context

This study was conducted at a South African institution where dental therapy and oral hygiene students are trained. The study was approved by the Humanities and Social Sciences Research Ethics Committee (HSSREC/00002902/2021). Gatekeeper permission was obtained from the registrar. All participants provided informed consent prior to the interviews and focus group discussions. Participants were assured that their anonymity and confidentiality would be maintained throughout the study.

### Authors' information

1. Dr Harsha Pillay, *BChD*, MMedSc Discipline of Dentistry, University of KwaZulu-Natal, Private Bag X54001, Durban, 4001, South Africa. dr.hpillay@gmail.com  
ORCID ID: <https://orcid.org/0009-0001-7455-5506>
2. Dr Rajeshree Moodley, *PhD* Senior Lecturer, Discipline of Dentistry, University of KwaZulu-Natal, Private Bag X54001, Durban, 4001, South Africa. moodleyra@ukzn.ac.za  
ORCID ID: <https://orcid.org/0000-0003-2703-9370>

### Authors' contributions

HP was responsible for data collection, data analysis and manuscript writing  
RM was responsible for research supervision, study design and manuscript review.  
All authors read and approved the final manuscript.

### Corresponding Author:

Name: Rajeshree Moodley  
Email: moodleyra@ukzn.ac.za

## Research design

This article is based on a qualitative study that aimed to explore the impact of COVID-19 on dental education at the study site. Data were collected through virtual, structured, individual interviews with dental educators over a period of four months in 2022. Staff members responded to questions about the successful aspects of training, the challenges that were encountered, their perceptions of the teaching methods used during the pandemic and the changes that supported continued teaching and learning during this time. Virtual focus group discussions were conducted with the 2021 and 2022 final year dental therapy students. Participants answered structured questions regarding the successful and challenging aspects of teaching and learning at the institution, support systems for students, their thoughts on blended learning and other teaching methods during the pandemic.

## Participants

Total population sampling was used as all 12 academic staff members within the Dental Faculty were invited, via email, to participate in the study. The goal of this was to explore a diverse range of perspectives and experiences. The information sheet, consent form and demographic details form were all attached to the invitation. All full-time and part-time lecturers and clinical supervisors were included in the study.

Student focus group participants were selected via snowball sampling to prevent biases in the selection process. This also enabled students to participate willingly in the study. An invitation, information sheet, consent form and demographic details form were emailed to the class representative and distributed to all 53 and 39 final year dental therapy students in 2021 and 2022, respectively.

## Data collection and analysis

In total, eight staff members responded to the invitation and agreed to participate in the study. Virtual interviews were conducted with six staff members via the Zoom platform and two participants were interviewed in person at the training site as per their requests. Two virtual focus group discussions were conducted via Zoom, each consisting of six students.

The interviews and focus group discussions were audio-recorded with the participants' consent, transcribed verbatim on Microsoft Word and transferred to Microsoft Excel. Data were analysed using thematic analysis. Initially semantic themes were identified, followed by the data being further categorised into latent themes (Campbell et al., 2021).<sup>5</sup> Eventually, four overarching themes were identified based on their relevance to the research objectives. The sub-themes were restructured several times to best represent the broader concepts. Braun and Clark (2006) noted that "a theme captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set".<sup>6</sup> This methodology enabled the collection of rich, in-depth data regarding the impact of COVID-19 on dental education, and enabled the researchers to identify patterns and themes across a diverse range of perspectives and experiences.

To ensure the validity and reliability of the findings, the data were analysed by two researchers independently. The researchers met regularly to discuss their findings and

to ensure that the analysis was consistent and thorough. Any discrepancies in the analysis were resolved through discussion and consensus.

## RESULTS

### Demographic details

Four staff participants (n=4) were aged between 41 and 50 years old, three (n=3) between 30 and 40 years old, and one (n=1) was 60 years old. Five (n=5) staff members were female and three (n=3) were male. Seven (n=7) participants were dental therapists and one (n=1) was a dentist.

The average age of the student participants was 21 years old. All six participants (n=6) of the 2021 focus group discussion were female. The 2022 group consisted of two males (n=2) and four females (n=4).

### Interviews and focus group discussions

Four pandemic-related themes were identified, namely the sudden shift to online learning and virtual communication (theme 1), safety protocols (theme 2), students' wellbeing (theme 3) and long-term implications (theme 4). Participant identities remained confidential throughout the study and have been replaced by participant numbers (Participant 1 to Participant 8). Quotes by the academic staff are indicated accordingly. Students' quotes are denoted by the term dental therapy, which has been abbreviated to "DT", and the year of study.

### Theme 1: Sudden shift to online learning and virtual communication

One major theme that emerged was the shift towards online learning, virtual patient simulations and virtual communication that took place in response to the pandemic. The opportunities and challenges presented by this shift are represented by the following quotes:

*"... During the pandemic we had to convert or conform to online teaching and learning. It was both a success and a challenge in the sense that we could continue teaching and we couldn't just stop the programme ... and we all had to adapt to this new way of teaching ..."* (Participant 1, academic staff).

Participant 8 reported that students adapted favourably to the online platform through engagement and interaction with the lecturer.

*"... When I tried to gauge feedback from the students they also found the platform quite interesting and different. They engaged and interacted quite nicely"* (Participant 8, academic staff).

E-learning expanded horizons and empowered students beyond traditional lectures by encouraging internet exploration and self-study as students were able to access academic content via the online platform.

*"E-learning is working for me because it made me realise that knowledge and power is not only from lecturers that we have in our university ... But it made me to explore more and familiarise myself with (the) internet and YouTube"* (Participant 6, DT 2021).

*"Also with the lectures, we recorded them and then got the students to watch it and then we had*

*discussions with them rather than doing a lecture with them so I think that also helped a bit"* (Participant 4, academic staff).

*"We have our online quizzes ... We also have tutorials, we give them self-reading and self-assignments ... I think that's what we're doing to actually engage with them and see how much they are actually grasping in terms of theory"* (Participant 8, academic staff).

Challenges associated with online learning included lack of student engagement during online lectures.

*"We can see by the logins, you know the register, that they are probably connected to the lecture but we don't know if they're physically away and physically there and listening to what you are saying so that became a real problem ... Also sometimes we ask students questions, they do not even respond"* (Participant 1, academic staff).

During the lockdown, on-campus accommodation services were suspended and students returned to their places of residence. Staff participants acknowledged the challenges presented by students' living conditions while engaging in home-based learning.

According to the students, difficulties were experienced in transitioning from traditional to online learning as students were unfamiliar with the latter. Face-to-face interaction was deemed more engaging as students were often distracted during online lectures. Furthermore, staff valued the physical presence of students during traditional lectures and noted how this benefited their learning.

*"... It was difficult during the pandemic, most of the students were not on campus, even at the residence, so they were at home in a different environment and they shared this home with other people and maybe they do not have access where it can be quiet, where they can answer freely. They do not have a good workstation where they can sit and listen to these lectures or whatever so that became a real problem"* (Participant 1, academic staff).

*"I think that there is a barrier between online learning and classroom learning because throughout our lives we were exposed to sitting down, traditional learning, and having the teacher in front of us. All of a sudden we just have this screen and we're expected to get things done so that's a bit difficult"* (Participant 2, DT 2021).

*"Online learning is new to most students and people interact more when it is face-to-face. With online lectures it is very easy to lose focus"* (Participant 3, DT 2022).

*"In terms of lectures, the face-to-face lectures are definitely better compared to online ... I think knowing that a student is present and in front of you carries a lot of weight"* (Participant 6, academic staff).

*"... As much as I do enjoy the online platform, I think maybe a weekly contact class is still necessary for*

*students who are finding it difficult to grasp certain concepts"* (Participant 8, academic staff).

Staff noted that connectivity issues and poor student participation were barriers associated with e-learning.

*"... E-learning is a bit difficult because a lot of students have connectivity problems and there is poor participation"* (Participant 4, DT 2021).

Alternate teaching methods were implemented in the absence of clinical training. Despite the successful efforts to enable continued learning, the use of educational videos was regarded as a compromise.

*"The area of the curriculum that suffered was the practical component ... besides having reduced access to patients, reduced patient intakes and quotas which were severely affected ... we had to use alternate teaching strategies, for example I would make videos of doing CPR or of treating a medical emergency which is not the ideal"* (Participant 2, academic staff).

Effective communication was crucial during the pandemic. The successes of these efforts, including how information was disseminated and concerns were addressed, are represented by the quotes below.

Virtual resources were made available to support learning during the lockdown, including lectures and useful websites.

*"Amidst the COVID-19 pandemic the University developed the Learn 21 and Learn 22 platforms that were designed for the lecturers, administrators and students ... It was the most successful thing that the University could have done ... Online study material were made available such as lectures, PDFs, eBooks, PowerPoint presentations, YouTube videos were uploaded, educational websites and apps"* (Participant 1, DT 2022).

At the peak of the pandemic, students' interaction with patients was limited due to concerns regarding transmission of the COVID-19 virus. Social media platforms, such as WhatsApp, served as a means of sharing clinical cases with students. Privacy and confidentiality were maintained by censoring patients' identities and confining the shared information to WhatsApp which is end-to-end encrypted. This ensures that communication cannot be accessed by third parties.

*"In clinical training ... if there were 5 patients and 10 students in the clinic, the 5 students will get patients and ... do a case presentation ... Whatever they did in the clinic and what they learned was put in a group chat where all the students in that current year would be. You could put your radiograph up, they could look at that case presentation and comment and ask questions"* (Participant 5, academic staff).

Challenges of virtual communication included data restrictions. Due to the dependence on virtual communication, students required sufficient data to fulfill their academic requirements.

*"Some of us are staying at home, some at residences or private accommodation and not all*

those at the private accommodation have WIFI. With the 10GB we get per month they have to communicate, look at the videos and everything. So at the end of the month, they will have no data. They can't communicate with the lecturer, they can't download slides or do anything with insufficient data" (Participant 1, DT 2021).

### Theme 2: Safety protocols

The study site adapted their facilities, equipment and policies to maintain safety while providing quality education. This was implemented to protect staff, students and patients. Staff and students wore surgical gowns and two masks while in the clinics. Both groups were also vaccinated and monitored for changes in temperature on a daily basis.

"Students have been put into clinical groups where they can continue with clinical practice, as well as in the preclinical lab where students are divided into smaller groups. This allows for social distancing and for teaching to go on. Staggered teaching was introduced ... students come in at different times to minimise too many students being in one place" (Participant 8, academic staff).

"... They enter the clinical area with your face shield, double mask and once you get into your cubicle you put on your PPE (surgical gown). That is only removed once the patient is dismissed and the cubicle is clean. In that way I must say that I've had 0% infections at the peak of COVID during 2020/2021 right up to now ..." (Participant 7, academic staff).

"I think also getting the students to vaccinate was part of the program that was implemented to prevent the spread of the pandemic" (Participant 5, academic staff).

"On a daily basis temperatures were checked and records were taken by the sister in charge" (Participant 6, academic staff).

Student safety was also ensured by teaching smaller groups who were present in the lab and clinic at different times of the day.

Curricular changes limited preclinical and community-based training in an effort to reduce transmission of the COVID-19 virus.

"... Some of the other things that were affected were for example our preclinicals where we had reduced contact unlike in the past where we were able to have more content" (Participant 2, academic staff).

"... There were no outreach programmes. Students were not allowed to go into the community and do any extractions or examination of patients and so forth" (Participant 6, academic staff).

### Theme 3: Students' wellbeing

The pandemic significantly impacted the mental health and wellbeing of students, which emerged as a theme in the data. Not only did home-based learning present challenges, once training resumed students were expected to fulfill their academic commitments in a reduced period of time.

"... This is the most stressful semester I ever had during my Varsity life because right now there is a lot of pressure. We are expected to present multiple presentations, followed by assignments, tests and everything at the same time. We are being rushed. On the other hand we are not getting to see enough patients and we are expected to provide or submit portfolios for different modules but with us having to do well with our tests" (Participant 6, DT 2021).

"As much as a lot of them would say that we've had 8 months or 2 years to be at home and we're supposed to know all of our stuff ... there's a lot of challenges that come with just being at home. It's not like we're learning for 24 hours in a day. So them being understanding ... that we are students that are coming from not having exposure to all of the things that we are doing now will help a lot and take a lot of pressure off of us ..." (Participant 2, DT 2021).

"Virtual teaching and learning process ... it was a whole new experience for teachers and students at the university, so there was some kind of stress and anxiety that was experienced by lecturers and students. The university's counselling unit offered assistance to all stakeholders in terms of psychological distress and also assisted students in a wide variety of ways to maximise their academic successes" (Participant 1, DT 2022).

### Theme 4: Long-term implications

The final theme that emerged was the impact of the pandemic-related changes on the future generations of dental professionals.

Students reported concerns regarding graduation due to limited preclinical and clinical training, as well as the reduced number of patients who presented at the training site.

"Honestly speaking I don't think it's enough to actually qualify. Everything feels so pressured and we have to get things done at this point so we have no choice basically. I don't think the preclinical exposure was enough to go into the clinics" (Participant 2, DT 2021).

"I feel like with the clinical training, if you ask me if after this I'd be ready to graduate I really don't think so because we are not seeing enough patients" (Participant 4, DT 2021).

## DISCUSSION

In response to the pandemic, the University Teaching and Learning Office implemented changes together with staff training. This was then adopted by the Discipline. At the end of the year, module evaluations were conducted and the courses were subjected to an external moderation process.

The curricular changes ensured the safe and continued delivery of content including the global adoption of online teaching methods.<sup>7</sup> This serves as an example of the resilience educational model which, according to AlQashouti et al. (2023), is defined as "the ability of an educational system to withstand and adapt to challenges and to continue the delivery of high-quality education despite these challenges".<sup>3</sup> Nandy et al. (2020) reported that a resilience model supports interaction between "individuals, family and



the environment”, elaborates on the root causes of stress among all stakeholders and may assist institutions in their post- COVID-19 recovery.<sup>8</sup> According to Nandy et al. (2020) resilience is achieved by overcoming crisis, exhaustion and competition by surviving, rebuilding and thriving respectively.<sup>8</sup> The authors of the current study reported that virtual platforms for communication and teaching enabled theoretical content delivery at the peak of the pandemic. Support systems existed in the form of counselling services and data allocation which aided students in their virtual learning endeavours. The safety protocols implemented by the current training site supported rebuilding of the academic programme once face-to-face training resumed. These protocols were identified as a theme and will be elaborated on in this discussion.

Students exclusively engaged in home-based learning during the national lockdown which presented unique challenges for each individual. The 2021 cohort of students were most severely affected by the timing of these changes, as reflected by their feedback. Without detailing the challenges that were experienced during this unprecedented time in their studies, students commented on how lecturers’ expectations did not correspond with the reality of studying at home. A South African study by Basson et al. (2022) reported that 59.3% of participants were responsible for household chores, community support, family commitments and part-time employment in addition to their academic commitments during this time.<sup>9</sup> Staff participants of the current study were cognisant of and empathetic about students’ personal circumstances and the impact of communal living on their studies. Similarly, AlQashouti et al. (2023) acknowledged that distractions, such as domestic responsibilities, may exist in a “non-educational setting” such as a communal residence.<sup>3</sup> While the majority of participants (91%) in the study by Basson et al. (2022) resided with their families during the national lockdown, 83% experienced moderate to severe anxiety during this period.<sup>9</sup> The respective authors noted that this may be “indicative of a broader dynamic within the family or community that was not the purview of this study”.<sup>9</sup> While this was similarly not investigated in the current study, the existing data demonstrates the challenges associated with home-based learning and the possible influence this may have on students’ mental health.

As cited by Hakami et al. (2021) the effects of the lockdown included loneliness, loss of freedom, insecurities about the future, uncertainty of recovery and boredom.<sup>10</sup> According to Giallonardo et al. (2020) and Wathélet et al. (2020), this may result in post-traumatic stress disorder, anxiety and psychoses.<sup>11,12</sup> Etajuri et al. (2020) reported that students were concerned about their “emotional health”, “being stressed”, “social connections” and “loneliness”, especially due to the lockdown restrictions that isolated many students at their hostels.<sup>7</sup> Stress was reported as a barrier by the 2021 cohort of students. During this challenging time, various support systems were available at the current study site including the academic staff, academic development officer and Student Support Services. As a further suggestion, the 2021 student participants were in favour of interactive discussions with the staff that would enable disclosure and acknowledgement of their concerns and challenges. Authors Anjali and Vidya (2020), Sa et al. (2021) and Khanagar and Alfadley (2020) recommended counselling sessions and support programmes for staff and students who were experiencing difficulties with their mental health.<sup>13-15</sup>

Students at the current study site identified favourable aspects of e-learning such as recorded lectures and the convenience of accessing study material on the platform. According to AlQashouti et al. (2023) virtual platforms for communication, teaching and assessment, among others, enable “independence, autonomy and self-governance”.<sup>3</sup> The postponement of all face-to-face academic activities at the peak of the pandemic redefined the role and responsibilities of students regarding their own learning. Students were solely accountable for their time management and the number of hours dedicated to their studies during the lockdown. At the current study site, the change in lecture format encouraged student-centred learning as students were expected to engage with the available material prior to and in preparation for a class discussion on the topic. Interestingly, students felt empowered to supplement formal teaching with information from the internet such as YouTube videos and case discussions on their social media groups. This may be described by the self-determination theory which, as defined by Ryan and Deci (2017), “elaborates how sociocontextual factors either support or impeded an individual’s motivation through fulfilment of their basic psychological needs”, namely “autonomy, competence and relatedness”.<sup>16</sup>

Despite the positive outcomes of self-directed learning, staff participants raised concerns regarding poor attendance and students’ inattentiveness during online interactions. Both staff and students of the current study reported that online learning was impersonal and less engaging than face-to-face lectures. The study by Shah et al. (2021) concluded that student engagement may be stimulated by a learning climate that fulfills the basic psychological needs of students.<sup>2</sup> Furthermore, the authors placed emphasis on the importance of prioritising students’ psychological needs for the benefit of their wellbeing, as a means of improving their online learning experience and building resilience for future disruptions to learning.<sup>2</sup> While the current study site provided students with an allocation of data, internet connectivity was often unstable and varied depending on their area of residence. Sarwar et al. (2020) reported challenges relating to online learning such as limited internet access and poor student-teacher engagement.<sup>17</sup> Studies by Wang et al. (2021) in China and John and John (2021) in South India concurred with these findings.<sup>18,19</sup>

Face-to-face teaching was preferred by students as this method was familiar and they were more focused when physically attending lectures. Face-to-face lectures were also considered more engaging than the online format and enabled lecturers to identify students who did not understand the content. Despite participants’ preference for traditional, classroom-based lectures, the use of blended learning was considered as an effective method of incorporating online learning into the curriculum rather than being implemented in isolation. Kim et al. (2008) defined blended learning as the combined implementation of in-person and online teaching.<sup>20</sup> While this method requires access to technological devices and stable internet connection, self-directed learning was encouraged by “enhancing student autonomy and motivation”.<sup>21,22</sup> Students in the study by Løset et al. (2022) similarly supported the resumption of face-to-face teaching after the pandemic and “asynchronous video lectures”<sup>23</sup> which are pre-recorded and accessible at students’ convenience rather than at a scheduled time.

As reported by participants of the current study, the delivery of the medical emergencies module was affected due to restricted contact with students and patients. Lecturers created and shared videos that demonstrated relevant content to students. According to Machado et al. (2020), various forms of social media such as Facebook, YouTube, WhatsApp and Instagram may serve as alternative teaching platforms.<sup>24</sup> The same authors cited a study by Alshiekhly et al. (2015) who supported the use of Facebook when teaching the theoretical aspect of medical emergencies.<sup>25</sup>

As with all forms of teaching, assessments were conducted online. The examiners allocated a time limit for each question in order to prevent students from consulting their notes. While this was understood by students, participants noted that unstable internet connectivity and the limited time available to answer each question presented challenges. Chang et al. (2021) recommended the use of a lockdown browser to prevent students from searching for answers online during their assessments.<sup>1</sup> A further suggestion was to virtually monitor students during their tests through platforms such as Zoom and Google Meet.<sup>13,26</sup>

Preclinical training was severely affected during the pandemic, as reported by the 2021 cohort of participants. Students expressed feeling underprepared due to their limited experience within the laboratory prior to treating patients in a clinical setting. Several solutions have since emerged from the literature as a means of continuing this aspect of training should similar circumstances arise. The use of haptic or virtual reality devices has been supported as a replacement for traditional phantom heads, which are used during preclinical training, and as a means of refining students' dexterity and fine motor skills.<sup>1,27,28</sup> As reported by Gailbourg et al. (2020) and Shrestha et al. (2020), portable instruments and equipment such as manikins may enable students to conduct preclinical training at home.<sup>29,30</sup>

Once contact training resumed, students attended preclinical and clinical sessions in designated groups which limited overcrowding. Safety protocols at the study site included the stringent use of PPE in and around the clinical area, as well as vaccination of students and staff to prevent transmission of the virus. As supported by Meltzou et al. (2021), staff and students were monitored for symptoms daily.<sup>31</sup> Løset et al. (2022) reported that the University of Bergen in Norway implemented "reinforced infection control measures" which included the use of face masks within the faculty, additional infection control equipment and a high standard of hand hygiene.<sup>23</sup> The authors also reported that students, staff and patients who presented with respiratory symptoms were not accommodated in the clinic.<sup>23</sup> The University of Malaya employed similar screenings and prevention measures.<sup>7</sup> The aforementioned institution also ensured that each clinical cubicle was contained, a safe PPE donning and doffing area was created, students only treated one patient per session and that dental materials and equipment were available in a cubicle to "minimise the movement and interactions between students and staff".<sup>7</sup> Sharaf and Kabel (2021) supported the use of a rubberdam during indicated procedures, the use of 70% ethyl alcohol and sodium hypochlorite as disinfectants between appointments and wearing face shields.<sup>32</sup>

Both the 2021 and 2022 cohorts of students reported limited exposure to patients, partly due to a decrease in patient intake and attendance of appointments. Another

common concern among the students was their ability to achieve curricular requirements such as clinical quotas amid these challenges. The 2021 cohort expressed concerns regarding insufficient clinical training and resultantly being underprepared as graduates. Students' trepidation regarding the effects of the pandemic on preclinical and clinical training were similarly expressed by participants in the studies by Brondani and Donnelly (2020) and Karaaslan et al. (2020).<sup>33</sup> Løset et al. (2022) reported that one in five dentistry students either considered postponing their studies or did so due to limited clinical training, uncertainty and stress relating to the pandemic, lack of training due to quarantine, restricted social interaction and their mental health.<sup>23</sup> According to the same authors, the fourth-year students "were significantly more stressed" as a result of their limited clinical proficiency ( $p=0.012$ ) and concerned about graduating as competent dentists.<sup>23</sup> Similarly, Loch et al. (2021) reported that students were "concerned about completing clinical and graduation requirements".<sup>30</sup>

While this was not identified as a theme, the reintroduction of community-based learning in 2022 motivated and encouraged students to interact with professionals from varying disciplines and to gain clinical competence in unfamiliar dental settings. The 2022 cohort of students were therefore more confident in their skills and ability to successfully graduate compared to the 2021 cohort. These results may highlight the value and benefits of community-based training within a dental curriculum, a finding which is also supported by the literature.<sup>36-39</sup>

## LIMITATIONS

Since focus group participants were recruited from a single study site, the sample may not be representative of the broader population in the country. Data triangulation was therefore used to overcome sample bias. The researchers conducted a cross-sectional study and curriculum review. These findings were not reported in this article.

The focus group discussions were conducted virtually as opposed to in person, which requires access to a suitable technological device and stable internet connectivity. These restrictions may have prevented interested individuals from participating. Participants' cameras remained off for the duration of the discussions. Flayelle et al. (2022) reported that participants may be distracted by their surroundings, limiting their ability to interact with others. Lastly, non-verbal behaviour such as eye contact and body language were not observable.

## CONCLUSION

This study aimed to provide a comprehensive overview of the impact of COVID-19 on dental education at a South African institution. This was achieved through the student focus group discussions and staff interviews. While the results of this study cannot be generalised due to the use of a single study site, several findings were consistent with the literature. Moreover, the results contribute to the existing understanding of staff and students' experiences during this unprecedented time.

Suggestions for future research may include follow-up studies that investigate the long-term effects of the pandemic on dental institutions and the students who graduated during this period. Further insight is required to understand how the respective graduates have managed the transition from students to dental professionals. This information may also enable institutions to implement curricular changes and

support systems that benefit future students who encounter similar circumstances.

As highlighted by this study, future studies that investigate students' perceptions of their residential environment and its effects on their mental health may be valuable in understanding underlying challenges and enabling institutions to provide support where needed.

Recommendations from this study include the re-evaluation of a student's role in their academic journey. Through encouragement and empowerment, students should engage in self-directed learning thus redefining the role of the lecturer from the source of information to a facilitator in the learning process.

The advancements in technology should motivate institutions to keep abreast of the latest teaching aids and dental equipment to teach students according to current practice. The implementation of virtual reality simulators or take-home manikins, for example, may limit future disruptions to preclinical training.

Lastly, institutions may consider extended platforms for clinical training, such as local dental practices, that expose students to procedures in the absence of formal training at the institution.

The knowledge acquired by institutions during the pandemic must serve as a foundation for future events that jeopardise the delivery of dental education. A resilient model can play a key role in guiding decision-making and policy development, particularly in terms of staff-student interactions and the implementation of virtual contingency plans to address potential disruptions in the curriculum. As a solution, institutions may also consider embracing innovative and untraditional ways of training students. Furthermore, institutions must find ways to support staff and students academically, emotionally and mentally. Although cited in previous studies, this article further highlights the importance of consultation and dissemination of information among institutions for the progression of dental education.

## DECLARATIONS

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### Ethics approval

Ethical approval was granted by the Humanities and Social Sciences Research Ethics Committee (HSSREC/00002902/2021). All participants consented to their participation in this study.

### Competing interests

The authors declare they have no competing interests.

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## Online CPD in 6 Easy Steps



The Continuing Professional Development (CPD) section provides for twenty general questions and five ethics questions. The section provides members with a valuable source of CPD points whilst also achieving the objective of CPD, to assure continuing education. The importance of continuing professional development should not be underestimated, it is a career-long obligation for practicing professionals.

