Educación Médica

ORIGINAL ARTICLE

The staff's perception of level of clinical competence of graduating dental students amid COVID-19: A qualitative research in one Saudi dental school

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Abstract

Introduction: The COVID-19 pandemic had a huge impact on dental education and assessment. This study focuses on the changes made to the delivery of teaching, assessment, and clinical competence of the final year students enrolled on the dentistry programme of the Faculty of Dental , Qassim University during the COVID-19 pandemic.

Material and methods: This is a full qualitative study that uses semi-structured interviews to focus on the faculty members of one dental school in Saudi Arabia. The online interviews were performed using Zoom platform. The interviews were transcribed verbatim and analysed using thematic analysis. Themes were gathered and grouped into emerging topics. Purposive sampling method was adopted and continued until data saturation was achieved.

Results: The change to online delivery of teaching proved to be a good solution for the cohort immediately affected by COVID, however, the online delivery of teaching placed significant amount of added pressure on faculty members. The work-life boundaries blurred and most staff complaint of long hours of working, mostly into the late evening. Despite the fact that the COVID graduating cohort achieved less clinical experience compared to typical graduates, a useful agreement between the University and college allowed newly graduated dentists to focus on the areas of low experience during their first rotation of their internship.

Conclusion: Despite COVID's challenges and lockdowns and its effect on teaching and assessment, staff believed that students were graduating at a safe beginner level. With mitigating strategies in place, the newly graduated dentists achieved the same amount of experience as a typical graduate but over a slightly prolonged span of time.

PALABRAS CLAVE
Evaluación;
Odontología;
Competencia clínica;
Enseñanza en línea;
Pandemia de Covid-19;
Experiencia clínica

La percepción del personal sobre el nivel de competencia clínica de los estudiantes de odontología que se gradúan en medio de COVID-19: una investigación cualitativa en una escuela de odontología de Arabia Saudita

Resumen

Introducción: La pandemia de COVID-19 tuvo un gran impacto en la educación y evaluación dental. Este estudio se centra en los cambios realizados en la entrega de la enseñanza, la evaluación y la competencia clínica de los estudiantes de último año matriculados en el programa de odontología de la Facultad de Medicina Dental de la Universidad Qassim durante la pandemia de COVID-19.

Material y métodos: Este es un estudio cualitativo completo que utiliza entrevistas semiestructuradas para centrarse en los miembros de la facultad de una escuela de odontología en Arabia Saudita. Las entrevistas en línea se realizaron utilizando la plataforma Zoom. Las entrevistas se transcribieron literalmente y se analizaron utilizando un análisis temático. Los temas se reunieron y agruparon en temas emergentes. Se adoptó y continuó el método de muestreo intencional hasta que se logró la saturación de datos.

Resultados: El cambio a la entrega en línea de la enseñanza resultó ser una buena solución para la cohorte inmediatamente afectada por el COVID, sin embargo, la entrega en línea de la enseñanza ejerció una cantidad significativa de presión adicional sobre los miembros de la facultad. Los límites de la vida laboral se difuminaron y la mayoría del personal se queja de largas horas de trabajo, sobre todo hasta altas horas de la noche. A pesar del hecho de que la cohorte de graduados de COVID logró menos experiencia clínica en comparación con los graduados típicos, un acuerdo útil entre la Universidad y la facultad permitió a los dentistas recién graduados centrarse en las áreas de baja experiencia durante su primera rotación de su pasantía.

Conclusión: A pesar de los desafíos y confinamientos de COVID y su efecto en la enseñanza y la evaluación, el personal creía que los estudiantes se estaban graduando a un nivel principiante seguro. Con las estrategias de mitigación en vigor, los dentistas recién graduados lograron la misma cantidad de experiencia que un graduado típico, pero durante un lapso de tiempo ligeramente prolongado.

Introduction

The Global COVID-19 pandemic imposed practical and logistical challenges to the education sector, especially for vulnerable groups such as dental students. Recognizing the potential academic loss to students, the reduction in clinical experience during the lockdown affected both the educational aspect, as well as the skills and technical sides.

Most of the dental schools across the globe, including College of Dentistry, Qassim University (CDQU), had to switch from the traditional face-to-face teaching to purely online education. At a later stage, a hybrid approach to teaching was adopted with an attempt to slow down the spread of the virus by reducing the need for face-to-face attendance.

The pedagogy transformation occurred through implementing reorganized strategies evolving around the available technology. Eliminating or reducing face-to-face lectures, using technology to replace and/or enhance clinical and laboratory-based teachings, and promoting individualized and inter-professional education were amongst some of the highly recommended strategies.[1–3]

During the lockdown, the students at CDQU resumed their theoretical lectures via the University virtual learning environment (Blackboard 9, Blackboard Inc, Reston VA). The Educational Timetabling Unit (ETU) emailed the schedule of online lectures as well as their learning outcomes and log in details to staff and students on 12th Mach 2020.

The faculty members assigned to deliver the lectures were instructed to record their lectures and send the recording to the respective block organizers prior to set deadlines. The recorded lectures served as a reference for those students who could not attend the live lecture for a variety of reasons, including poor health or technical problems. The block organizers uploaded the recordings on Blackboard. One male and one female faculty members were assigned as points of contact for students should they have any questions about the content of the online lectures.

The number of phantom head practical sessions were doubled. The cohort were divided into two groups with one group attending each session. This allowed for social distancing during the skills sessions. The supervised clinical training sessions for students were reduced by 30%. This was done to ensure the social distancing and cross infection control during the clinical sessions. Subsequently, the clinical competency requirements were reduced.

Formative and summative assessment remained an integral part of the education system that had to adapt to the new delivery methods. For example, the students were asked to communicate their draft presentations with their supervisors either by email or social media instead of the conventional face-to-face meetings. In some occasions, the assessments were conducted on the basis of coursework that were completed prior to the suspension of the classes.

The changes to the curriculum and assessment were done sudden and without prior preparations. There was a need to understand if these changes affected the Saudi dental graduate's clinical competency since the clinical side was the most aspect that got affected during the covid -19 pandemic.

Another significant change in assessment was the shift of the assessment weight in favour of continuous assessment. The weight of the continuous assessment was increased to 80% while the weight of the end-of-block exams were reduced to 20%. The end-of-block assessments were conducted online.

There was also a significant shift from closed-book exams to open-book examinations, allowing students to consult textbooks and notes during timed assessments. In some instances, written papers were replaced with project work, to allow more flexibility.

The aim of this study was to understand the perception of the clinical competence of graduating dental students from the staff's point of view amid changes made to the educational system amid COVID-19 in CDQU.

Material and methods

For this study, qualitative research approaches were utilized to investigate a more in-depth focus for the investigation of the research topic.[4,5] The current study used a qualitative methodology to allow the development of an independent, substantive theory to understand the dental clinical supervisors' perceptions of the graduating cohort of dental students amid changes made to the teaching and assessment strategies of CDQU, which was influenced by COVID-19 restrictions.

We used thematic analysis technique that is very useful for conducting research in qualitative research. It is used to look more in depth make an understanding of the data; by compare the pieces of data to make a theme as the sentences of the interviews were coded as were relevant and then were compared to make a story.[6] Thematic analysis found to be useful and more fixable method for qualitative research.[7] The data is gathered together to form an integrated theory that describes the problem being studied. The themes are used to help to answer the research question.[8]

Qualitative research isn't focused with 'statistical generalisability', although it can be rigorous if done properly.[9] Thematic analysis is suitable for analysing and understanding experiences, ideas, or actions throughout a data collection.[10] The most frequently acknowledged methodology for doing thematic analysis consists of six steps: becoming aware with the data, creating initial codes, looking for themes, evaluating themes, defining and labelling themes, and delivering the report.[11]

Over the period of ten months, data was gathered through one-to-one semi-structured interviews. Because one-to-one interviews are appropriate for studying people's descriptions of their experiences and probing their perspectives, this method of data collecting was chosen.[12] Participants were provided with written details of the proposed study via email in advance, and they responded with a scanned copy of a completed consent form, verifying that they had read and understood the details, and that they consented to be interviewed, and for their answer to be used anonymously.[13] The interviews were conducted online using Zoom platform (Zoom Video Communications Inc, San Jose CA).

The research was conducted at a single dental school in the Saudi Arabia CDQU:. Purposive sampling method was used to allow the interviewer to retain a good balance of gender and experience among the interviewees. Seven clinical staff members (three females, four males) were interviewed. The staff members all participated in the teaching and evaluation online. The experience of the staff ranged between 5 to 14 years, ensuring all participants had experience of teaching and supervising dental students pre- and post-COVID-19. The continuous analysis of interviews guided the choice of participants[14] until data saturation was achieved.[15]

The first author conducted the online interviews. Prior to the interview, she observed the run of the clinical activities on the clinics, modified to COVID measurements, as well as all relevant evaluation processes in the clinical environment, to familiarize herself with the procedures and therefore facilitate discussion with research participants. The first author recorded and transcribed the interviews verbatim. For the interviews conducted in Arabic, the first author transcribed and translated the recordings into English.

Staff were interviewed about their professional backgrounds, understanding of the undergraduate course, training and experience in assessing students, including their utilisation of the existing grading system, and their views on the impact of COVID on assessing students' abilities. After each interview, the data was analysed using thematic analysis technique. The analysis generated substantial concepts that were employed to guide further interviews.[8]

From the beginning data gathering and analysis were done simultaneously. The data was analysed using thematic analysis.[16] This method can be used to find and analyse meaning patterns in a dataset.[17] It shows which concepts are significant in describing the topic under investigation.[18]

The first author conducted the thematic analysis, which was reviewed by the study supervisor for accuracy. In the event of a disagreement, the theme was addressed between the two and a decision was reached through mutual agreement. This paper only discusses concepts that are related to the study's aim.

Results

Between March 2021 and January 2022, a total of seven interviews were conducted. The interviews lasted from 40 to 80 minutes. The interviewer was able to further explore emerging themes using semi-structured interviews.

Emerging themes and sub-themes

The workload

All the participants reported that the sudden stop of teaching and the uncertainty with the COVID-19 pandemic made the transition to online teaching an immediate and urgent matter. There was not enough time for a planned change to the online delivery of the curriculum.

"The first year the main challenge was that the teaching stopped suddenly and life stopped suddenly and each one of us was [at] home. We had to act fast. We had one or two lectures left. We gave the lectures online to the students and sent the PowerPoint slides to the students. [All of a sudden] we had to record our voices on the PowerPoint and upload it onto Blackboard….". Interview 2.

"There was no office hours and When the pandemic happened, we were almost done with the academic year. We recorded [them] and I kept listening to my [own] voice and tried to eliminate any external noises, like the noises in the street. [Sometimes] I found [myself] to record it all over again to keep it professional for the students, so that was the challenging part but it wasn't [too] hard though! It was all manageable for me…." Interview 2.

One of the disadvantages, however, was lack of access to an acceptable work environment, with distractions from young children, family members and house choirs getting in the way. The changes also blended the work time and home time boundaries, making staff work until very late hours in the evening.

"… for us female [staff] it was a bit tough; especially those of us who had younger children. We had to multi task between the kids and work and house chores…." Interview 3.

"… It changes your social life! It was difficult for me! There was a lot of pressure. I was feeling [under] huge pressure to give lectures at night, with [my] family [being around], [etc]. It was different, your life was different, especially that everything happened at night, lectures, exams, all, even my sleep pattern was different…" Interview 3.

The challenge was the new academic year, whereby taught and clinical teaching had to be delivered in a different format amid COVID-19 restrictions.

"The following year was harder though, 2021, because the clinics were open again. We were worried for the students and staff and patients and the students' families and so everyone was so scared

of corona and now we are going back to the clinics and treating patients. Giving the close nature of our job with the patients. We were worried! For example, the medical doctor can treat the patient from a distance but for us there is no way to do so. I always had the fear that […] this will be the last two weeks of my life…!" Interview 2.

Limitations to the online teaching

The participants reported that there were multiple challenges to online teaching. Perhaps the most significant challenge was the attendance of students. attendance became an issue of significant ambiguity. Staff complain that students log in but there is no way to control if they were at their devices. Staff utilized several techniques to understand if the students are present and paying attention, for example, asking questions or giving breaks to see if students leave and come back. None of the techniques that were tried and tested, however, proved to improve attendance.

"… first of all, you lack the interaction! Half of the time you don't know if the students are there or not! Yes, their laptop is on but are they really there? […] Secondly, there is no body language. You cannot tell if you are making any sense to the student or not. Thirdly, most of the curriculum of the medical and dental student consist of skills, and manual work, and clinical practice. There is no way you can achieve those things with an online system! […] 60% of the curriculum need to be practiced. […] I am sure that the student who graduated during that time were [to some extent] affected… For me, I think, the only advantage of online teaching is that it keeps everybody safe […] but teaching medical and dental students online in not my cup of tea…" Interview 1.

Staff felt that despite all improvements in technology, there were areas that they felt limited in how they could transfer their knowledge efficiently. An example was when the use of 3D models proved to be beneficial to the teaching. Clearly, with the online lectures, the ability to demonstrate concepts in the 3D was eliminated. The staff, however, were understanding of such limitations and offered the final year students to return to them should they have any questions or queries.

"… I am an old fashioned [person]! […] I like the face to face more! I like the whiteboard and I like illustrating on the whiteboard and drawing for the student. I like interacting with the students! Teaching online actually cancelled any interaction with my students! I could see usernames on the screen but I have no idea who they are! They could be logged in but actually not there. I am not focused 100% for the whole hour of the lecture…" Interview 2.

" … Another issue with the online [teaching] is that even though you put pictures and videos and illustrations for the student to understand, some of them cannot visualise some of the procedures." Interview 3

"…with their orthodontics cases, what students are used to do is to practice on each other; whether with casts or taking pictures and records. […] but in that particular year, we couldn't do it. They just picked random patients from the total patient care list and whatever records they had we had to assess them on it. For example, [in many cases] they didn't have a cephalometric [radiograph in the patient's records]. You know, you can't assess an orthodontic case without the patient cephalometric…". Interview1.

Limitations to the online assessments

Poor internet connection was experienced by staff and students alike.

"… The challenge we faced was lack of stable internet connection. There were many incidences where either the staff or the student lost their connection during the exam. I think this is a global issue though…". Interview 7.

The most common theme, however, was the possibility of the academic malpractice. Since online exams were not invigilated, there was a high chance of cheating and collusion among students. Due to cultural boundaries, staff were unable to ask students to sit their exams while their webcams were on; therefore, students had every opportunity to take advantage of the unsupervised exam condition. There were allegations of academic malpractice where staff noticed some students answered short answer questions identical to each other, however, there was not enough evidence to prove it as an offense.

"…what happens with the online assessment is that you can't guarantee that the student does not cheat. So if you are going to do online exams it needs to be in the form of a quiz with short questions with limited time where they can't cheat. Like within seconds the student would only have one chance to answer the question and won't have time to cheat…" Interview 2.

For some requirements, the School allowed simulation to replace the patient experience, while for some requirements, an agreement shaped between the University and the College so that the interns can complete their pending requirements in the first rotation of their internship year.

"… our main concern was the final year, there was no major issues we were able to do the presentation skills, the OSCE and the theoretical part …" Interview 6.

"… for the students who didn't finish their requirements, we asked them to carry out the lab work like for example the removable partial denture; they will carry out all the lab work and do all the wax work until it reaches the processing stage. I think the endo department did this as well; they asked the students to carry out the rest of the requirements on acrylic teeth so they would be able to have marks on their requirements.

For the interns the college did something called 'mini-series' which was like [a combination of] lectures and workshops in different topics. …"Interview 4.

Quality assurance and support

The staff agreed that the university was very supportive during the pandemic and that they managed to have good internal assessment system throughout the pandemic.

"… surprisingly we had a very good support system from the Qassim university *like in no time they developed a very detailed and organized Blackboard online system. The IT department developed e-learning workshops on how to use the Blackboard […] and in two days we [were up and running…]. There were workshops on getting familiar with the online PBL system, and how to upload your files and how to upload your course and how to run the PBL. Also, we used to do critical thinking sessions. These were all uploaded onto Blackboard and were done online. From the university point of view, they really did everything they could and were very like beyond helpful and gracious and also the staff also showed great interest and were cooperative…"Interview 1.*

Despite all the infection control guidelines in place, a few staff and students were tested positive with COVID-19. The programme, however, progressed to move to face-to-face teaching and positive cases were dealt with according to the national guidelines to stop the spread of COVID-19.

Any patient who used to come with a cough I used to ask them to leave immediately unless they came with a PCR [to confirm] that she is negative and the cough is for something else; like asthma. [Similarly,] any student that felt that they were showing symptoms, we asked them to call us and not to come to the clinics. We even stopped the attendance register so they wouldn't be worried about [getting penalized]. [… We] encouraged them to be honest. After their symptoms were gone, we asked them to do a PCR to come back.

The return to the face-to-face teaching

Once the COVID-19 restrictions started to ease off, it was possible to bring the students back to the campus for their exams and clinics. The exams remained online but were conducted at venues within the campus using tablets and iPads. This reduced the chance of cross infection by going paperless and yet eliminated the chance of academic malpractice.

"… you know, before we had papers for the exams and then we decided to go paperless! This happened in the second phase when we came back after the lockdown. I recommended it 100%! I think every school should do it! […]the students had to come to the college but it was all electronic! No papers were used at all! It was on tablets and iPad, it was MCQ exam and we had a

committee to organise it and apply the social distance measurements and all of that…" Interview 7.

"… During COVID [the general expectation was that] we should only treat emergency cases but we decided to improve our infection control guidelines and let them treat all types of patients. I think COVID has given us an opportunity to promote critical thinking. I was giving my students a session on the critical thinking. One of the student asks me if smokers are more likely to get COVID? I told him that this is a great question! Why don't you all search [on this topic] and you tell me if being a smoker makes you more vulnerable to COVID…". Interview 5.

Doing it all over again

Staff were asked about their experience of COVID-19, the lessons learned and if they would have done anything differently should another pandemic happens. An interesting and pragmatic suggestion was creation of a 'emergancy committee'. This committee will have members from all common education and assessment committees of the school and the role of the committee would be to initially assess the situation, and to react and response fast to the disaster, in this case another pandemic. The committee will have an executive role to implement the changes, provide mechanisms to support and train the staff and students and oversea the delivery of the new protocols.

"… for me we would have to be prepared with a good team and team decision and also with the dean guidance. But as the dean is always busy, I recommend to have like an emergency team with members from the e-learning, the curriculum, and the assessment committees and clinical staff and educational staff and university staff, so I think they can properly prepare training with presentations on how to tackle the situation. […] At the same time, [the process needs] regular monitoring in the form of 360 feedback, students and staff and patients and full evaluation. There was a communication gap between us as staff and students and between staff and division heads so if things go back I will try to manage this…" Interview 5.

Although the response of the school to the COVID-19 pandemic was fast, however, it happened based on people's goodwill and hard work, instead of planned systems in place.

Staff agreed that with having online teaching materials prepared and the experience of delivering online under their belts, moving online swiftly in the next pandemic would be a lot easier. Introduction of quizzes to online lectures, in particular with some assessment weight on them, will ensure that students are not just logged in, but actively participating in the lectures.

"…we can make it fully online, so there is no problem, and we can implement it online again. We find solutions to all our online problems; like for example the exams, that we can put exams with limited time so that the students won't have time to cheat. For lack of student interaction, for example, we can choose a group of students in every lecture and tell them that they are

going to be marked. This will make them participate. And [we can set] rules for interaction.…" Interview 7.

"… I am always pro assessment-friendly without putting extra pressure [on staff and students]. So similar to the PBL quiz, I think it would be very effective to have a post-lecture quiz. The quiz could be really simple like only 5 questions, no more, and the answers of this quiz should be used as the attendance marks. This will guarantee two things: first, the student will have to read the lecture to be able to answer the quiz and secondly, that we will guarantee that the student will be logged in for real to listen to the lecture and complete the quiz in real time…". Interview 4.

Effect of COVID-19 on the clinical competence of students

The participants agreed that the cohort who was mostly affected by the pandemic was the cohort of the first lock down. Since the clinics came to halt and people were sent home, the 2019-20 cohort had to cut their clinical experience short. According to the staff, this cohort graduated while achieving around 70% of clinical competence level of a typical graduate.

"… to be fair that batch was an active batch so when we analysed their requirements, we found out that most of the 23 students were able to finish 80% of their cases so it wasn't too bad. […] so we agreed to let them graduate and then during the internship to finish the cases and requirements they needed…" Interview 2.

"… for the batch of 2019-20 I think they are only competent by 70%. They had more to achieve to reach the ones before them. But the 2020-21 batch, I think, they are [fully] competent and good and comparable to our normal graduates. They are the same! They are good and competent…"Interview 5

This was partially due to the restrictions imposed by COVID-19 infection itself, in terms of reduced clinical capacity and social distancing and at the same time due to reduction in the number of patients willing to attend the dental hospital. The effect was more significant in departments that their typical patients belong to the high-risk groups, including elderly.

"… the ministry of health told people who were above 60 not to do any [dental] procedures unless it is an emergency, as they were more vulnerable to catching COVID, so that affected the situation even more. […] Obviously that affected our patients' flow. We had fewer patients compared to the pre-COVID and it was noticeable.

We didn't have enough cases for them to acquire the experience and competency [expected] so it affected their level of competency compared to pre-COVID. […] The removable department was specially affected because there was a lot of

patients who were scared and worried to come to the clinic and this affected the competency of the students…" Interview 4.

The government and the college, however, were very supportive. The agreement between the University and the College allowed for an effective line of communication to open between the two so that the school could inform the college of the areas that newly graduates required further training. For example, there were students who were graduating without the experience of endodontics. Such experience was given to the student in their first rotation of their internship year.

"… well, we made sure to try and make up for the lost time they had lost in COVID, so they compensated a lot in the internship rotation they have here in the college. We made sure to compensate for the part that they lost; for example, if someone have not worked any endodontics, we would focus to make them work endodontics more than any other speciality. The same [applies] if a student worked a lot of operative dentistry. We would assign him more cases of other specialities, so that's what we did…." Interview 2.

With return to the face-to-face teaching and clinics amid enhanced cross infection control measures, the future COVID cohorts of students had no problem achieving their clinical requirements and completing their quotas.

Discussion

The purpose of this research was to understand the level of clinical competence of graduating dental students from the staff's point of view amid changes made to the educational system amid COVID-19 in CDQU. There is no doubt that the epidemic and subsequent lockdowns had a substantial impact on dentistry's learning process. Traditional education has been affected by the fact that most of the taught teaching went online for over three years. The way the College of Dentistry dealt with the pandemic produced some innovative solutions that can be kept and implemented into curricula once the COVID pandemic is over.

Other studies have suggested that the pandemic has shifted and forced the education system to be revolutionized using current technology.[19] Our study found that the staff agreed that the way dentistry is taught will change after this pandemic, which corresponded with other studies suggesting that the pandemic has shifted and forced the education system to be revolutionised using current technology.[19]

This paper demonstrates how online learning and teaching have considerably aided the educational process for both students and faculty, providing a wide range of flexibility and convenience for students, as well as being a usually safer option for all students and faculty. This was in accordance with other studies in the literature,[20–22] which stated that one of the key benefits of online learning was its convenience and comfort. In addition, a number of studies have highlighted the advantages of employing technology for distant or remote learning.[23–25]

In addition, most dental schools around the world relied heavily on internet-based platforms for their online teaching and assessment during the pandemic.[26] During the pandemic, our dental school depended significantly on its virtual learning environment, Blackboard, and the online video platform, Zoom.[27] Because Blackboard had been in use for many years for students to access educational materials and information, it was already known to all students and most staff members. Staff and students found online platforms to be simple to use, and they felt comfortable using them to conduct teaching and exams. These findings are consistent with those of previous similar studies.[28]

However, another of the biggest drawbacks of online learning was the lack of social connections between tutors and learners, as well as among staff. This isolation barrier made them feel as if they weren't giving it their full attention, that it was difficult for them to keep the students engaged, and that the attendance was poor. This was comparable to another study,[29] which found that one of the challenges of online learning was a loss of human contact and fulfilment. And this was found in other studies like Maatuk, Elberkawi[30] where they identified the loss of human interaction as the main drawback of using online teaching.

The clinical side of teaching was the area that was most affected. The first lockdown disrupted the practical side, and even after students returned to the clinics, they were still affected by COVID restrictions, absences due to self-isolation, and shielding. Returning back to the clinics proved challenging with resistance from both staff and student. The fear of catching the virus was inevitable, however, it was overcome by reassurance and having enhanced cross infection control systems in place. Other studies[31,32] came to similar conclusion.

As a result, it was felt that the clinical and practical aspects of teaching had been compromised, which could be concerning when assessing students' competence and ability to operate as a safe beginner following graduation. Despite the fact that the time spent in the clinics was greatly reduced and fewer cases were treated, our participants agreed that the students were safe beginners. This was because a good link was formed between the university and the college so that newly graduates could continue with enhancing their clinical experience during their internship.

Despite all efforts, however, the switch from face-to face to e-learning surfaced a number of problems including limitations in information technology, lack of online educational materials, and poor technological skills of staff and students, as well as emotional, mental, and physical health issues due to dramatic changes in one's social life.[33]

The summative assessment, as well as the teaching, had to move online. According to staff involved in student evaluation, such tests were better received by students. Students took online tests with less tension and anxiety since they were in the comfort of their own homes. However, the participants reported that they didn't prefer it as they viewed true and false as the weakest form of assessment and was not beneficial in terms of validity. The major drawback, however, was lack of invigilation during the exams for the first COVID cohort. Students were allowed to sit summative exams at home unsupervised, which resulted in allegations of academic malpractice and collusion. This problem, however, was addressed by bringing all students back to the university for their exams with social distancing

measures in place and turning exams paperless to reduce the chance of cross infection.

In summary, many examples which demonstrate learning from difficult experiences (e.g., emergence of COVID -19, response to disasters) changed discovery, science, and patient care. Students and educators can help document and analyze the effects of current changes to learn and apply new principles and practices to the future. This is not only a time to contribute to the advancement of medical and dental education in the setting of active curricular innovation and transformation, but it may be a seminal moment for many disciplines in medicine.[33]

Despite all the advantages of online learning and assessment and the fact that it allowed education to continue even during lockdowns, it is still not a substitute alternative for clinical and traditional teaching and evaluation. More progress should be made to assure students can achieve competence graduate at a safe beginner's level.

During this epidemic, the ability of students, faculty, and dental education providers to adapt to the new normal has substantially improved, and it is believed that moving forward will be easier and less burdensome. To successfully conduct online teaching and assessment in dentistry, this study recommends three primary broad-impact concepts:

Firstly, online and blended delivery of instruction may have a negative impact on work-life balance. It's important to avoid overworking and overloading staff and students.

Second, students appreciate the "on-demand" style of online education. For the sake of revision, course designers should consider recording and archiving their teaching educational materials.

Third, summative assessment needs to be invigilated. Exams can still run paperless online but held at venues at the campus with invigilators present.

Finally, despite the pandemic reduced the clinical training of final-year dental students to approximately half of what it should have been, their clinical competence met Saudi Arabia's demands of the society due to improved staff-to-student ratios and higher clinical efficacy resulted in comparable quantitative and qualitative clinical outcomes and they were competent to practise dentistry.

Ethical

The study received favourable ethical approval from the University Research Ethics Committee Ref: 2021-12637-20137 in 2021.

Informed consent

I confirm that I have the participant confirmed consent.

Conflict-of-interest statement

The authors have no conflicts of interest to declare.

All co-authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

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