

The Impact of Coronavirus Disease Pandemic on the Oral Surgical Field among Specialists and Dental Students

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Abstract

Background: Dental education and student's dental practice suffered significantly during and immediately after coronavirus disease (COVID-19) pandemic. Many obstacles have been addressed and new issues have emerged through the use of e-learning. **Objective:** The study aims to assess COVID-19 pandemic impact on dental education and evaluate the effect of online education on surgical clinical skills of dental students in oral surgery field. **Materials and Methods:** Two anonymous online questionnaires were distributed to dentists teaching in oral surgery departments in teaching hospitals of dentistry colleges and dental students in Iraq asking about their experience of e-learning and its effect on dental education and practice. MS-Excel spreadsheet records of final practical exam were obtained from Oral Surgery and periodontics department for the academic years (2018–2019), (2020–2021), and (2021–2022) for comparison. **Results:** From 155 oral surgeons, 71% reported a negative effect of COVID-19 pandemic on the course of lectures in 2020, and about 58.7% described an effect of COVID-19 pandemic on communication with students in 2020. About 73.5% noted very weak and week clinical performance of the students during the pandemic in 2021. From 586 dental students, 89.4% expressed that the pandemic affected their study and clinical practice, and 82.5% proclaimed a beneficial value of the e-learning on communication and studying with female students preferring e-learning. The comparison of exam results of the 5th grade before, during, and after the pandemic were highly significant (P value 0.000). **Conclusion:** COVID-19 pandemic had a significant negative impact on dental education and on oral surgery clinical practice and skills of the dental students.

Keywords: COVID-19 pandemic, dental education, dental students, e-learning, oral surgery specialists

INTRODUCTION

Education, particularly higher education, faces a number of difficulties as a result of coronavirus disease (COVID-19) pandemic and the following national and international lockdown, which also affects the economy, the global health system, and society as a whole.^[1] All on-campus teaching, hands-on training, and teaching clinics have been suspended due to Universities' shutdown.^[2] Therefore, to deal with these extraordinary circumstances and to ensure a safe environment for students, staff, and patients, both medical and dental colleges rapidly developed several distinct approaches including online teaching and learning.^[3,4]

Medical and dental students could access only online sources, which includes power point presentations, live or recorded lectures, video-based or case-based learning, interactive learning, online whiteboard teaching, virtual models, and webinars.^[5,6]

Dental education has a unique format than medical education. Fine motor abilities and manual dexterity are particularly important in the field of dentistry and developed through training.^[7] The students' clinical training requires physical contact with the patient that cannot be replaced by telehealth formats like medical colleges.^[8]

Dental students exposed to aerosols due to the direct contact with the oral cavity which is a significant infectious pathway of the new coronavirus (SARS CoV2).^[9-12] The risk of infection increased as a result of this contact.^[13]

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The changes in education and clinical practice adversely affected all surgical training specialties, including oral and maxillofacial surgery knowledge and skills.^[14]

COVID-19 pandemic's loss of theoretical education and clinical skills have a significant effect on students' psychological health and possibly lacking confidence when treating patients. In order to restore the scientific knowledge, skills, and psychological wellbeing, dental education has to do a considerable amount of work.^[15]

The aim of this study to assess the impact of COVID-19 pandemic on dental education and to evaluate the effect of online education on the surgical clinical skills of the dental students in oral surgery field.

MATERIALS AND METHODS

This is a cross-sectional descriptive study using a virtual survey which was carried out in Iraq to evaluate the impact of COVID-19 pandemic on dental education especially and to assess the effectiveness of the online education system. The Ethical Committee in Oral Surgery and Periodontics Department, College of Dentistry, Mustansiriyah University approved this study.

Two separate anonymous online questionnaires were designed using google forms. The first questionnaire was designed for Oral Surgery specialists who were part of faculty member of any Dentistry College in Iraq. This questionnaire included the following: participant demographics, the effect of the COVID-19 pandemic on the course of the lectures and on communication with students in 2020, the clinical performance of the students during the pandemic in 2021, the effect of the COVID-19 pandemic on research activity and attending online seminars and lectures.

The second questionnaire was designed for students in their third, fourth and fifth year in Dentistry Colleges in Iraq.

This questionnaire included the following: participant demographics, the effect of the COVID-19 pandemic on the course of the lectures and on clinical practice, the value of e-learning on communication and studying during the pandemic.

The questionnaires were distributed by the authors through social media, applications such as WhatsApp, and email via an anonymous link and open for one-week period.

The effectiveness of the online education system was assessed by comparing the results of the final practical exam of the fourth and fifth year students in Oral Surgery and Periodontics Department in College of Dentistry, Mustansiriyah University before and after the pandemic.

Data were obtained from MS-Excel spreadsheets records of the final practical exam in Oral Surgery and periodontics department for the academic years (2018–2019), (2020–2021), and (2021–2022). The final practical exam scores were from 20%.

Statistical analysis was conducted using the software program IBM SPSS version 24 (IBM, United States). For the survey responses, descriptive statistics were used to explore patterns in responses. Frequencies and percentages were used to present categorical data. Mean and standard deviation values were used to present quantitative data. The value of $P < 0.05$ was considered statistically significant.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients verbal and analytical approval before sample was taken. The study protocol, the subject information, and consent form were reviewed and approved by a local ethics committee according to the document number 464 (March 12, 2023) to get this approval.

RESULTS

Sample general characteristics

The total number of dentists included in the study was 155, who are teaching in oral surgery departments in the teaching hospitals of dentistry colleges in Iraq. Their age was ranging from 30 to 65 years. This group included 61.3% female and 38.7% male subjects.

The total number of students included in the study was 586 who were studying in the 3rd, 4th, and 5th grade in dentistry colleges in Iraq. Their age was ranging from 20 to 23 years. There were 71% female and 29% male subjects.

Faculty members in oral surgery departments of dentistry colleges with their students

From 155 participants, 71% of them reported a negative effect of the COVID-19 pandemic on the course of the lectures in 2020 [Figure 1].

About (58.7%) of the participants reported an effect of the COVID-19 pandemic on communication with students in 2020.

A total of (73.5%) from the teachers reported very week (21.9%) and week (51.6%) clinical performance of the students during the pandemic in 2021 [Figure 2].

Faculty members in oral surgery departments of dentistry colleges and research and online seminars and lectures

A total of (72.9%), (78.1%), (69%), and (64.5%) from the teachers reported publishing at least one research in 2019,

2020, 2021, and 2022, respectively, without any significant difference (P value 0.249).

A total of 61.3% of the participants reported attendance of online seminars and lectures during the pandemic. There was a statistically significant relationship between effect of attendance in online lectures and seminars with the number of researches published during pandemic (P value 0.018) [Figure 3].

Students

About 89.4% of the students reported that their study and clinical practice were affected by the pandemic, without any difference between female students and male students (P value 0.684) [Figure 4].

A total of 82.5% of the students reported a beneficial value of the e-learning on communication and studying with female students leaning more toward e-learning the male students P value 0.013) [Figure 5].

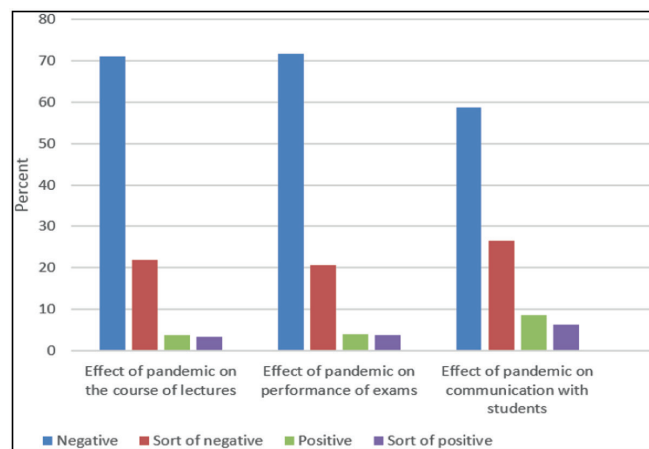


Figure 1: The effect of the pandemic on dental education and training (teaching staff responses)

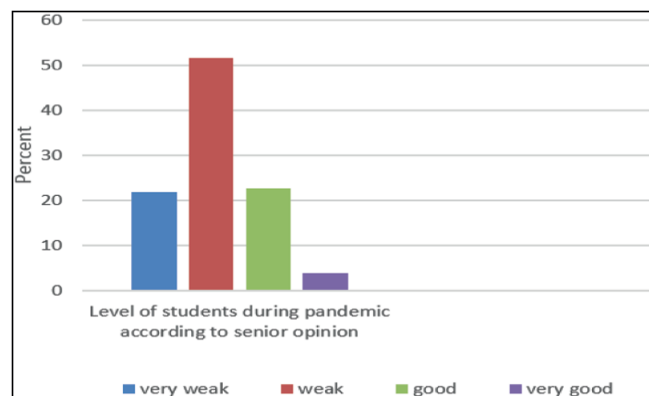


Figure 2: The level of students' skill during the pandemic in 2021 (teaching staff opinion)

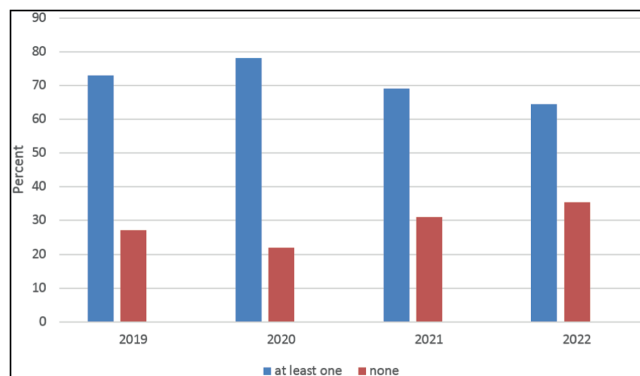


Figure 3: Research activity of the teaching staff before, during and after the pandemic

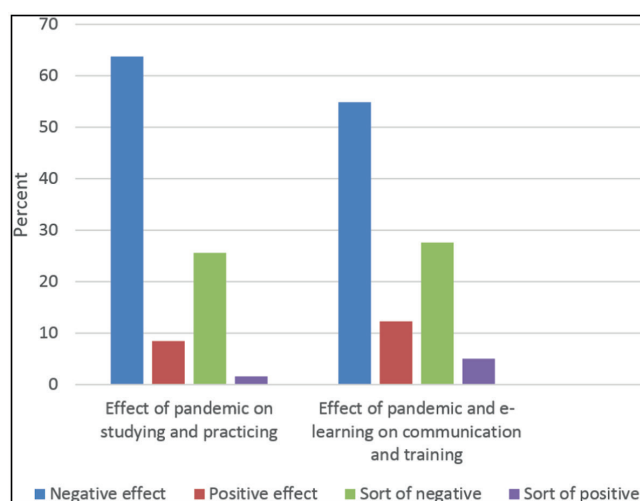


Figure 4: The effect of the pandemic on dental education and training (student responses)

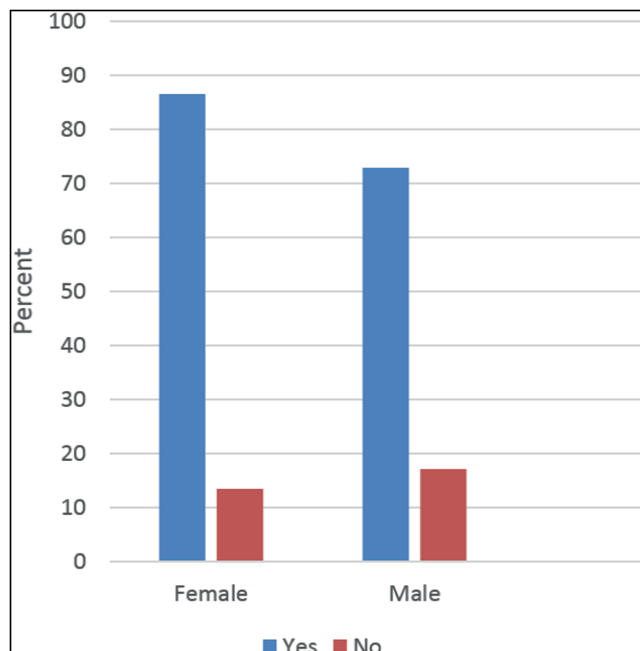


Figure 5: Students' preference of e-learning between genders

Practical exam results of the 4th and 5th grade students in Oral Surgery Department in College of Dentistry, Mustansiriyah University

For the academic year 2018–2019, the mean of the grades of the final practical exam results of 4th and 5th grade were 13.54 and 17.18, respectively.

For the academic year 2020–2021, the mean of the grades of the final practical exam results of 4th and 5th grade were 12.84 and 14.86, respectively.

For the academic year 2021–2022, the mean of the grades of the final practical exam results of 4th and 5th grade were 12.97 and 15.10, respectively.

When comparing the results of the 4th grade between (2018–2019) and (2020–2021), there was no significant relationship (P value 0.185), whereas in the results of the 5th grade between (2018–2019) and (2020–2021), there was a highly significant relationship (P value 0.000).

When comparing the exam results before the pandemic (2018–2019) and after the pandemic (2021–2022), the 4th grade showed no significant relationship (P value 0.262) whereas in the 5th grade, there was a highly significant relationship (P value 0.000).

DISCUSSION

The majority of faculty members of oral surgery department in dentistry colleges in Iraq reported a negative effect of the COVID-19 pandemic on the course of the lectures in 2020. These findings possibly arise from shortage in necessary technical practice due to inexperience in online or e-learning participation before the pandemic. Additionally, it is impossible to ignore the persistent issue of inadequate dentistry college infrastructure to cope with the high demands of online education. Decrease in the level of teacher-student interaction, decrease in student supervision, and decrease in the importance of role models are drawbacks of online lectures.

Similar findings were reported by Alafaleg *et al.*^[16] and Prieto *et al.*^[17] who all stated that face-to-face lectures cannot be replaced by online lectures. It also became evident that the absence of communication was seen as a main disadvantage by the teaching staff.

Tabatabaei *et al.*^[18] stated that e-learning might be utilized as a supplementary tool in intellectual and theoretical courses to help students enhance their knowledge, diagnostic, and reasoning skills.

In contrast to our study, Schlenz *et al.*^[19] who stated that more than half of the lecturers agreed with the utilization of online learning as a result of COVID-19 and thought it would be an effective alternative to teach theoretical lessons without losing any information.

Despite admitting that the majority of students were committed, lecturers felt that “face-to-face” teaching was more convenient.

Our study also revealed weak clinical performance of the students after the return of the teaching hospital clinics in 2021. This may be due to lack of clinical training and contact with patients and deficiency of practical skills during the important clinical training years (3rd, 4th, and 5th year) in spite of the online teaching and Manikin models training.

The results of a study by Jum’ah *et al.*^[20] were consistent with our study results. More than half of the participant faculty members reported a negative effect of suspension of conventional classes due to COVID-19 pandemic on academic achievements and clinical skills of students.

Nold *et al.*^[21] in their study showed that the majority of the participants preferred the traditional classroom as an ideal method for dental education. A sudden requirement for digital offers coupled with a lack of prior experience. Their explanation was that this circumstance briefly resulted in unreasonable needs. It should not be ignored that online teaching methods have drawbacks, such as eye fatigue from focusing on a screen, which leads to a loss in receptivity or a lack of interest.

Prieto *et al.*,^[17] Tabatabaei *et al.*,^[18] and Costa *et al.*^[22] stated that, from faculty members’ perspective, e-learning was ineffective at teaching practical skills.

Alafaleg *et al.*^[16] study results showed that the area most impacted by the pandemic was the clinical aspect of teaching. The first lockdown interfered with the practical training.

Loch *et al.*^[23] found that the majority of the staff did think that the students’ clinical performance was significantly impacted by the suspension of activity due to COVID pandemic.

Our study also revealed a direct relationship between increased attendance of online lectures and seminars with the increased number of researches published during the pandemic as online lectures and seminars were essential for providing education regarding dentistry during the pandemic.

Jung suggested that although online conferences are new and have some shortcomings, they could enhance the knowledge and communication of oral and maxillofacial surgeons. It is feasible to attend the international conferences without incurring the costs of accommodation and transportation.^[24]

Liu *et al.*^[25] found that live online dental continuous education lectures increased rapidly during COVID-19 outbreak as the dental continuous education transitioned from offline to online significantly.

France *et al.* found that due to COVID-19 pandemic, participation in “Introduction to Dental Medicine,” a huge open online course in dentistry, increased. The course was especially well-positioned due to its availability, established status, and open accessibility of course content.^[26]

Camerlink *et al.*^[27] reported that only 36% of the respondents have increase in the time spent writing articles while the majority of the participants reported having a significant increase in the amount of time needed for teaching and student supervision, and researchers admitted having less time for research. Also Myers *et al.*^[28] reported a reduction in research time between 30% and 40% for biological and agricultural sciences.

Cui *et al.*^[29] findings show that, in the ten weeks following United States lockdown, total research activity has risen by 35% when collecting data from the largest open-access preprint repository for social science.

Adarmouch *et al.*^[30] suggested that the use of communication technology and remote work were methods for encouraging or supporting research activity in the midst of COVID-19 pandemic. These strategies were developed or applied in various situations to permit the continuation of teaching and research activities.

The majority of the students (89.4%) reported a negative impact of COVID-19 pandemic and the resulting lockdown on their theoretical knowledge and practical skills, and they preferred the traditional “face-to-face” lectures to the online lectures. This is due to absence of clinical learning opportunities and missed practical experiences as well as lack human interaction during lessons.

Dental education cannot be completed entirely on a virtual environment because it necessitates appropriate physical settings such as preclinical laboratories and dental clinics. It is challenging for students to apply and correlate the practical aspects of the learned theoretical information without presentation or simulation on live study models.^[31]

The current study findings concur with Alhamdani *et al.* who reported an adverse effect of COVID-19 pandemic in the field of oral surgery, both in theory and practice.¹ In contrast, Hattar *et al.*^[32] reported that the students’ clinical training had the greatest negative impact due to COVID-19 pandemic.

Similar finding was reported by Hassan *et al.*,^[33] that is, the majority of students stated that shifting to online learning had a negative impact on their clinical experience. Jum’ah *et al.*,^[20] Loch *et al.*,^[23] and Badovinac *et al.*,^[34] found that more than half of the students thought that their clinical skills were negatively influenced due to COVID-19 suspension’s limited clinical exposure.

Costa *et al.*^[22] found that the majority of students believed online learning was useful for theoretical aspects but not for clinical aspect.

Shrivastava *et al.*,^[7] Islam *et al.*,^[35] and Antoniadou *et al.*^[36] stated that students favored face-to-face classes over online classes and stated that e-learning did not adequately prepare them for their clinical training. These results are consistent with the results of our study.

According to the findings of a study by Noor *et al.*,^[31] majority of the students had a negative impression of e-learning and they preferred face-to-face teaching to the e-learning.

Our study results disagree with two studies by Schlenz *et al.*,^[19] Hattar *et al.*^[32] wherein more than half of the participants favor online lectures over conventional lectures.

The students in our study agreed about the beneficial value of e-learning on communication and studying with female students prefers e-learning more than male students.

These results are consistent with Badovinac *et al.*,^[34] and Cheng *et al.*^[37] who stated that students in dentistry schools had favorable views of online classes.

According to the study of Schlenz *et al.*,^[19] significantly more female students than male students thought that online courses provided an educational advantage, which coincides with our current study.

Our results were inconsistent with Islam *et al.*^[35] and Antoniadou *et al.*^[36] who in their study stated that male students preferred online classes more than females; further, male students in general tend to be more knowledgeable and interested in technology advancements, and female students were having more difficulty and showing less interest in them.

Our study findings are in disagreement with the study conducted by Noor *et al.*^[31] and Badovinac *et al.*^[34] stating that female students were reported to be favoring conventional learning than male students.

Hung *et al.*^[38] in their study concluded that dental education was greatly affected by the COVID-19 pandemic. Their research shows that students are feeling more stressed than ever and believe their education and training have declined as a result.

The study showed the negative impact of the pandemic on the clinical practice of the 5th grade students with a declination in the mean of the practical exam results compared with the results before the pandemic, and then after the return to normal academic and clinical practice in 2021–2022, there was a slight elevation of the mean. The primary justification is that dental training is not suitable for distance learning due to the high proportion of critical practical skills needed to prepare dental students for their career. This reasoning is supported by many studies.^[3,20,21,39]

Sharka *et al.*^[3] concluded that live clinical cases involving patients in teaching clinics could not be replaced.

Alafaleg *et al.*^[16] study results showed that even after the students returned to the clinics, they remain affected by COVID severe restrictions, absences because of self-isolation, and shielding.

Thorpe *et al.*^[40] results were different. They showed that the clinical skills across all measured clinical oral surgery procedures were not affected when comparing data from 2017, 2018, 2019 with 2020 in the School of Dentistry, University of Sydney, Australia. Their reasoning was a rise in rural locations that compensated for clinical training in city teaching hospital.

Alafaleg *et al.*^[16] stated that regardless of the significant decrease in the clinical training of final-year dental students due to the pandemic, the students were reliable beginners. This may be due to enhanced staff-to-student ratios and higher clinical efficacy.

In contrast to our results, Prieto *et al.*^[17] showed a remarkable increase in students' grades in 2020 compared to 2019. They suggested that lack of supervision and discipline lead to plagiarism, which might have an impact on preserving the academic integrity.

CONCLUSION

COVID pandemic caused the shift of dental education from traditional to digital form (e-learning). Our findings indicate that the majority of dental teachers and dental students had negative views about e-learning and preferring the face-to-face education. There was a significant effect on the clinical skills of the students in oral surgery after the return of the teaching hospital clinics in 2021 due to lack of clinical practice in the pandemic year. This study showed that dental education and training are not suitable for distance learning due to the need of critical practical skills to prepare dental students for their career.

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Conflicts of interest

There are no conflicts of interest.

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