

The Change in Stress and Anxiety Level Caused by Practicing Dentistry During COVID-19 Pandemic

Noor H Ismail M.S., M.Pros. (RCSEd)¹, Yara Oweis M.S.C., Ph.D.¹,
Ayah A Al-Asmar Ph.D.¹, Islam Abd Al-Raheem M.S., A.B.O.D.¹,
Ala'a Sabrah M.S.D., Ph.D.¹

Abstract

Objectives: The aim of this study is to investigate the change in stress and anxiety level caused by practicing dentistry during COVID-19 pandemic, along with any financial impact and changes in dentists' cross infection control methods and history taking.

Methods: An online questionnaire was conducted between June 10th and 2nd of July 2020 which was distributed after the ease of the lockdown on the dental health sector in most countries. It consisted of four sections (demographic and general characteristics, financial, cross infection control, psychological and mental aspects).

Results: The questionnaire was completed by 480 dentists. Participants who were financially affected by the lockdown formed 87.5% of the full sample. There was an increase in the amount of stress they felt in the workplace after the pandemic, and a mean score of (7.1/10) for how much they worry about getting infected by COVID-19 while practicing dentistry. The female dentists had significantly higher stress level than the male dentists after the pandemic ($P = 0.001$) and significantly higher score for how much they worry about getting infected by Covid-19 while practicing dentistry ($P = 0.002$).

Conclusion: The COVID-19 pandemic made practicing dentistry more stressful than before along with fear of getting infected. Dentists who participated in this study are implementing more methods to prevent getting infected by COVID-19, which could be a positive effect if this level of care remains after the pandemic is over.

Keywords: COVID-19, cross infection, dentists, financial, psychological, pandemic.

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1. Introduction

The year 2020 was marked by the COVID-19 pandemic which affected 216 countries with 21.2 million confirmed COVID-19 cases including 761,000 deaths by the time this article was written⁽¹⁾. By the end of January 2020, the World Health Organization declared the pandemic to be an international public health emergency due to its fast spread⁽²⁾ which had driven many countries to implement

a nationwide lockdown to limit the spread of the virus. This lockdown which lasted for more than a month in most countries caused a financial hit to the affected sectors with dentistry being one of them.

Dentistry is considered a high-risk profession due to the close contact dentists have with their patients and the presence of aerosols, resulting from the various dental procedures which could carry pathogens and

¹Conservative Dentistry Department, School of Dentistry, The University of Jordan, Amman, Jordan.

Correspondence Noor H. Ismail:

D.D.S., M.S., M.Pros. (RCSEd).

Conservative Dentistry Department, School of Dentistry, The University of Jordan, Amman, Jordan, 11942.

E-mail: Noor.ismail26@yahoo.com, noor.ismail@ju.edu.jo

infect the dental health team^(3, 4). Dentists were asked to limit their dental procedures into treating emergency cases only⁽⁵⁾ which had financial consequences on the dental health sector, since most of the dental procedures became off limit⁽⁶⁾. This fact along with other reasons such as the clinical nature of this profession and the personality traits common among dentists makes dentistry a highly stressful profession⁽⁷⁾. Few studies have investigated the consequences of the COVID-19 pandemic on dentists. Most of them have focused on the changes in patients' management that were implemented to face the COVID-19 outbreak⁽⁸⁻¹²⁾. They also focused on the fear and anxiety the dentists felt while practicing dentistry during the pandemic (8, 10) and the way it affected their personal lives (9, 10). Few articles have warned about the financial implications of the pandemic on dental professions⁽¹³⁻¹⁵⁾ but only a few have investigated this concern such as The Irish dental association. They conducted a survey in March 2020 which concluded that 52% of its' members are expecting their income to drop by 90-100% due to the complete closure of their practices or limiting the dental procedures to treat emergency cases⁽¹⁶⁾.

This research aims at investigating the financial impact of COVID-19 pandemic on dentists from different nationalities and the measures they are implementing to compensate for the dentists' financial losses, along with any change in their cross-infection control methods. It also investigates the psychological and mental effect that this global pandemic had on them by looking into the stress and anxiety levels they felt while practicing dentistry and how much they fear

getting infected by the COVID-19 virus.

2. Materials And Methods

The ethical approval to collect the needed data was obtained from the School of Dentistry and the Academic Research Committee at the University of Jordan. Dentists from different countries and specialties were invited to answer an online questionnaire which was conducted after the ease of the lockdown on the dental field in most countries, between the period from 10 of June to 2nd of July 2020. Google Forms (Alphabet, Mountain View, CA, USA) was used to construct the questionnaire, which was written in English, and used a combination of multiple choice and scale of 1-10 questions. The questionnaire was validated through distributing it to 5 dentists out of the sample size and was modified afterwards according to the comments and feedback of those dentists. The questionnaire was distributed randomly using social media outlets (Facebook and Instagram) through several national and international pages specific to dentists.

The questions were divided into four section (demographic and general characteristics, financial aspect, cross infection control, psychological and mental aspects). The questionnaire used in this study is seen in Appendix (1). Active informed consent from all participants was obtained before filling the questionnaire, and the answers were recorded as anonymous to protect the privacy of the participants.

The answers were coded. The analysis was carried out using the software SPSS Statistics for Windows, Version 23.0 (IBM *SPSS* Statistics for Windows, Version 23.0. Armonk, NY: IBM) and the α -level was fixed at $p = 0.05$. All data were tested for normality using the Shapiro-Wilk test. Since all data was not

following a normal distribution, Wilcoxon Signed Rank test was used to test for changes within the same group and Mann-Whitney-U test was used to compare between female and male dentists' answers. p-value was set at 0.05.

3. Results

The survey was completed by 480 dentists (234 female and 246 male). Participants were from 28 countries; Australia, Austria, Bahrain, Brazil, Canada, Chile, Egypt, Germany, Iceland, India, Japan, Jordan, Kenya, Kuwait, Oman, Pakistan, Qatar, Russian Federation, Saudi Arabia, Sudan, Syria, Tanzania, United Arab Emirates, United Kingdom, United States, Uruguay, West Bank, and Yemen. They were grouped according to regions (Middle East 85.6%, North America 7.7%, Europe 2.5%, Africa 1.7%, East Asia 1.7%, South America 0.6%). Participants were also asked about the number of years they have been practicing dentistry shown in (Table 1). Most participants were general dentists 68.5% and the majority were practicing dentistry in the private sector as detailed in (Table 2 & 3).

Four hundred and twenty participants (87.5%) were financially affected by the lockdown and were asked further questions related to their financial situation. From this group of dentists 289 (68.8%) believed the financial impact will last for months, 69 (16.4%) believed it would last for years, 48 (11.4%) felt that it would have permanent effect while 14 participants (3.3%) believed it would only last for weeks. When asked about whether they were looking for another source of income outside of dentistry 189 (45%) answered yes to the question and 167 (39.8%) said they might consider it in the future. To overcome the drop in their income, 159

(37.9%) participants were thinking of raising their price list for dental procedures, 144 (34.3%) were going to apply for personal loans from banks, 140 (33.3%) were thinking of reducing the number of referral and instead do more procedures themselves, 107 (25.5%) were going to reduce the number of employees in their practice, 84 (20%) wanted to cut back on the practice expenses, and only 52 (12.1%) were going to receive financial aid from their government.

Female and male dentists in this study both believed that they hold enough information about COVID-19 regarding transmission, symptoms, infectivity, and aspects of prevention (Mean Score 7.8 /10) but they were not feeling competent enough to handle and treat patients known to be COVID-19 positive (Mean Score 5.6 /10), with female dentists feeling less competent than male dentists ($P = 0.001$) (Table 4). The number of years of practice (Table 1) had no effect on the amount of stress felt by dentists during and after the pandemic ($P > 0.05$) and nor did the dental speciality ($P > 0.05$) (Table 2).

When the participants were asked about the stress and anxiety level they felt while practicing dentistry before the pandemic (Mean Score= 4.9 /10) and afterwards (Mean Score= 7.7 /10) there was a significant increase in the amount of stress they felt in the work place (Related samples Wilcoxon Signed-Rank Test $P = 0.000$). There was no difference in stress level before the pandemic between the female and male dentists ($p = 0.0644$), while the difference was significant afterwards ($P = 0.001$). When asked about how much they worry about getting infected during dental work they gave a high score (Mean Score= 7.1 /10) with the female dentists significantly having a higher score than the

male dentists ($P = 0.002$) (Table 4).

The participants were asked about the change in their cross infection control methods after the pandemic; 411 dentists (85.6%) started wearing face shield, 402 dentists (83.8%) started wearing surgical gowns, 385 dentists (80.2%) changed their hand washing technique and/or frequency, 374 dentists (77.9%) changed their disinfection protocol between patients, 397 dentists (82.7%) started using N95 masks, 294 dentists (61.3%) started using high volume suction in more procedures than they used to, and 393 dentists (81.9%) were taking patients temperature to check for fever before treatment. Participants were also asked about any change in the way they take medical history from their patients, 437 (91%) were asking more questions about patients travel history, 368 (76.7%) were inquiring more about patients occupation, 446 (92.9%) were looking for any respiratory symptoms in their history taking. With a score of 7.6 /10 both female and male dentists strongly believed that the authorities should review the cross infection protocols and place stricter guidelines in the future.

4. Discussion

The global pandemic of COVID-19 has affected many fields and professions with dentistry being one of them. This study aimed at investigating the effect it had on dentists financially and psychologically. It also investigated the change in the way they practice dentistry when it comes to cross infection control methods and history taking.

The study included participants from 28 different countries with the highest percentage coming from the Middle East followed by North America. The big difference in sample size from each region made comparison based

on nationality unreliable. On the other hand, the numbers of female and male dentists were very close (234 female and 246 male) making the comparison more valid.

The majority of the Dentists involved in this study were practicing in the private sector (87.6%) which was affected financially by the lockdown due to the drop in patients' numbers attending the clinics, who were mostly attending for emergency treatment. The other sectors (Teaching Hospitals, Public or government practices, military services, and non-profit clinics) also suffered a drop in their income due to the lockdown, although they had a fixed income coming from their organisations which continued to pay their salaries. This could be explained by the fact that most of them were practicing dentistry in the private sector as part timers, and that in some countries, e.g. Jordan and Saudi Arabia, the salaries were reduced during the lockdown period, to overcome the financial burden they had during the pandemic.

The financial impact raised a concern about the way dentists were managing this crisis. Thirty four percent of participating dentists would apply for personal loans. However, loans could put further financial strain on them in the future. Other dentists would reduce the number of referrals and do more procedures themselves (33.3%), or reduce the number of employees in their practice (25.5%), or cut back on the practice expenses (20%); all of which could compromise the quality of treatment the patients would receive and create more cases of dental negligence in the future. The fact that only (12.1%) were going to receive financial aid from their governments shows that the dental sector might not be receiving enough support from the governments in the countries involved in this

study. Similar studies conducted in Italy found high concern from the participating dentists about their professional future and hoping for economic measures from their government to help them overcome the financial impact^(10,11). These findings should be interpreted with caution since the readings could vary from one country to another and with time, hence future re-evaluation of the financial condition is needed with more focus on a specific country or region to draw more relatable conclusions.

Dentistry is a high risk profession which is reflected on the amount of stress and anxiety dentists feel in the workplace⁽⁷⁾. Practicing dentistry in the middle of a global pandemic made it even more stressful. Female dentists scored significantly higher than the male dentists in the amount of stress they felt after the pandemic (Mean Score = 8.2/10) and how much they worry about getting infected (Mean Score = 7.6). These findings could be explained by the fact that women are at greater risk for anxiety and depression than men when faced by stressful situations⁽¹⁷⁾. In this study the mean score of how much dentists fear getting infected during practice (7.1/10) comes in agreement with the finding of Consolo U *et al.* study which reported 85% of the participants to fear getting infected during practice, and the findings of Ahmad *et al.* which found that 78% of the surveyed dentists to be anxious and scared by the devastating effect of COVID-19 pandemic. The number of years of experience did not have any effect on the amount of stress and anxiety felt by dentists before and after the pandemic nor did the dental speciality which shows that the pandemic caused a concern between dentists from all age groups and speciality.

Although dentists in this study believed that they had enough information about COVID-19

regarding transmission, symptoms, infectivity, and aspects of prevention, they were not feeling competent enough to handle and treat patients known to be COVID-19 positive, a similar result was found in a study conducted by De Stefani *et al* involving 1500 Italian dentists, which could be explained by the fear they have about getting infected and the fact that the virus is highly infectious⁽³⁾. This pandemic had a strong effect on the cross infection control methods that were practiced by dentists, most of them started wearing a face shield (85.6%), surgical gowns (83.8%), N95 masks (82.7%) which were previously used only in surgeries and for high risk patients. These results are slightly more positive than what was found in another study which showed only 61% of the participants to adhere to the new cross infection protocols⁽⁸⁾. Although the recommendations for hand washing and disinfection protocol have not changed from what they were before the pandemic⁽¹⁷⁾, (80.2%) of participating dentists implemented changes to their hand washing technique and (77.9%) changed the disinfection protocol between patients. This raises a concern about the level of cross-infection control the dentists had before the pandemic. Dentist started taking patients temperature and a more detailed medical history especially about any respiratory symptoms and about patients' travel history (Fig 1), which could help avoid treating active COVID-19 cases and reduce the risk of getting infected. Dentists in this study strongly believe that the authorities should review the cross infection protocols and place stricter guidelines in the future which could be something positive coming from this global pandemic.

This study had few limitations such as the

sample was not evenly distributed with more participants coming from the middle east than the other regions, also the way the study was conducted which limited the participants to social media users only and might have missed on other dentists which could not be reached using this method of distribution. Future research is needed that is country or region specific with larger sample size to draw more accurate conclusions about the impact this pandemic had on the dental health sector.

The COVID-19 pandemic made practicing dentistry more stressful than before along with fear of getting infected. Dentists who participated in this study are implementing more methods to prevent getting infected by COVID-19, which could be a positive effect if this level of care remains after the pandemic is over.

Conflict Of Interest

The authors declare no conflicts of interest related to this study.

5. Conclusions

Table 1. The participants distribution according to the number of years practicing dentistry

Number of years	Percentage
less than 5 years	24.2%
5-10 years	24%
10-15 years	17.9%
more than 15 years	34%

Table 2. The dental specialities of the participating dentists

Speciality	Frequency	Percentage
Restorative Dentistry	21	4.4
Maxillofacial Surgery	17	3.5
General Dentist	329	68.5
Prosthodontics	51	10.6
Endodontics	12	2.5
Orthodontics	19	4.0
Periodontics	17	3.5
Paediatric dentistry	9	1.9
Oral surgery	4	0.8
Dental Radiology	1	0.2
Total	480	100.0

Table 3. The different sectors where the participants in this study are practicing dentistry

Sector	Full Sample	Female Dentists	Male Dentists	Dentists whose income was affected by the pandemic
Private practice	387 ^a	171	216	339 (87.6%) ^b
Teaching Hospital	41 ^a	24	17	35 (85.4%) ^b
Public or government practice	74 ^a	48	26	64 (86.5%) ^b
Military service	12 ^a	6	6	11 (91.7%) ^b

Non-profit clinic	5 ^a	2	3	4 (80%) ^b
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^a some participants were practicing dentistry in more than one sector.

^b number of dentist that were affected (the percentage of the affected dentists)

Table 4. The mean and standard deviation for the scale of 1-10 questions that were asked in the questionnaire along with the p value for the (Mann-Whitney U test) investigating the presence of any significant difference between the female and male dentists

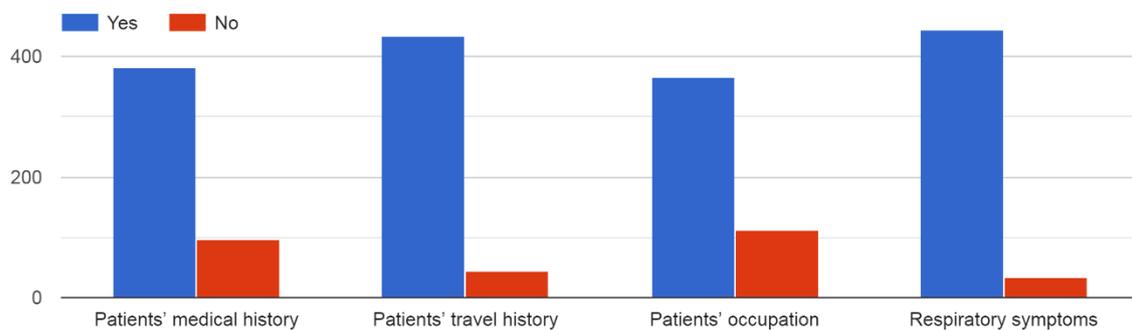
	Full Sample	Female Dentists	Male Dentists	Female vs Male Dentists
Do you think the dental authorities need to review the cross-infection control protocols and have a stricter guideline?	7.6 (2.6) ^a	7.9 (2.2) ^b	7.3 (2.8) ^c	$P = 0.108$ ^d
Do you feel competent about handling and treating patients known to be COVID-19 positive?	5.6 (2.9) ^a	5.1 (2.7) ^b	6.0 (3.1) ^c	$P = 0.001$ ^d
How much do you worry about getting infected during your practice since the Pandemic?	7.1 (2.7) ^a	7.6 (2.3) ^b	6.6 (2.9) ^c	$P = 0.002$ ^d
How much stress and anxiety did you feel practicing dentistry before the COVID 19 Pandemic happened?	4.9 (2.7) ^a	4.7 (2.7) ^b	5.1 (2.8) ^c	$P = 0.064$ ^d
How much stress and anxiety do you feel practicing dentistry after the COVID 19 Pandemic happened?	7.7 (2.3) ^a	8.2 (1.9) ^b	7.3 (2.5) ^c	$P = 0.001$ ^d
Do you think you hold enough information about COVID-19 regarding transmission, symptoms, infectivity, and aspects of prevention?	7.8 (2.1) ^a	7.7 (1.8) ^b	7.8 (2.2) ^c	$P = 0.084$ ^d

^a Mean (Standard Deviation) for the full sample.

^b Mean (Standard Deviation) for the female dentists.

^c Mean (Standard Deviation) for the male dentists.

^d p value for the Mann-Whitney U test, the α -level was fixed at $p = 0.05$.

**Figure 1. The distribution of the responses to the question “Did the pandemic change the way you take patients medical and social history”**

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تأثير جائحه كوفيد-19 على مستوى القلق والتوتر الذي يختبره أطباء الأسنان خلال مزاولتهم لمهنتهم

نور إسماعيل 1، يارا عويس 1، أيه الأسمر 1، إسلام عبد الرحيم 1، آلاء صبرا 1

1- قسم المعالجة التحفظية، كلية طب الأسنان، الجامعة الأردنية.

الملخص

الأهداف: الهدف من هذه الدراسة هو التحقيق في التغيير في مستوى التوتر والقلق الناجم عن ممارسة طب الأسنان أثناء جائحة كوفيد-19، إلى جانب البحث عن وجود أي تأثير مالي وتغيرات في أساليب مكافحة العدوى لدى أطباء الأسنان. **الأساليب:** تم إجراء استبيان من خلال الإنترنت بين 2 و10 يوليو 2020 وتم توزيعه من خلال وسائل التواصل الاجتماعي بعد الغاء قرارات إغلاق قطاع طب الأسنان في معظم البلدان وعودتهم لمعالجة المرضى بشكل اعتيادي، وتكونت الاستبانة من أربعة أقسام (الخصائص الديمغرافية والعامة، والتأثيرات المالية، ووسائل مكافحة العدوى، والجوانب النفسية والعقلية).

النتائج: أكمل الاستبانة 480 طبيب أسنان. شكل المشاركون منهم والذين تأثروا مالياً بالإغلاقات 78.5٪ من العينة الكاملة، وكانت هناك زيادة في مقدار الإجهاد النفسي، والتوتر الذي شعروا به في مكان العمل بعد الوباء بمتوسط (7.1 / 10) كمدى قلقهم بشأن الإصابة بفيروس كوفيد-19 أثناء ممارسة طب الأسنان. وعانت طبيبات الأسنان من مستوى إجهاد نفسي أعلى بشكل ملحوظ من أطباء الأسنان الذكور بعد الوباء ($P = 0.001$) ودرجة أعلى لمدى قلقهن من الإصابة بفيروس كوفيد-19 أثناء مزاولتهن طب الأسنان ($P = 0.002$).

الاستنتاجات: لقد جعلت جائحة كوفيد-19 ممارسة طب الأسنان أكثر إرهاقاً من ذي قبل إلى جانب تخوف أطباء الأسنان الملحوظ من الإصابة بالفايروس أثناء مزاولتهم لطب الأسنان، يطبق أطباء الأسنان الذين شاركوا في هذه الدراسة طرقاً وقائية أكثر حزمًا من ذي قبل لتجنب الإصابة بفيروس كوفيد-19 الذي قد يكون له تأثير إيجابي إذا استمر هذا المستوى من الرعاية بعد انتهاء الوباء.

الكلمات الدالة: كوفيد-19، نفسي، منع العدوى، أطباء أسنان، مالي، جائحة.