Occupational stress and stress busters utilized among Saudi dental practitioners during the COVID-19 pandemic outbreak

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Running Title: Stress among dental practitioners
Abstract

Aim: This study aims to assess the stress levels, stress busters (stress relievers), and coping mechanisms among Saudi dental practitioners (SDPs) during the COVID-19 pandemic outbreak.

Methodology: Self-administered questionnaire was sent to SDPs via Google forms. Cohen's stress score scale was used for stress evaluation, and the mean scores were compared based on age, gender, qualification, and occupation. In addition, comparisons of the utilization of stress coping mechanisms and stress busters based on gender, age, and occupation were evaluated. Descriptive statistics were carried out using SPSS (Version 21.0, Chicago, Illinois, USA).

Results: A total of 206 SDPs (69% males and 31% females) participated in the study. Male SDPs showed a higher score than females (P>0.05). SDPs around 50 years and above obtained high-stress scores (25±7.4) as compared to other age groups (P<0.05). The occupational level showed higher stress scores (22.6 ± 4.6) than the other occupation groups (P<0.05). The majority of the SDPs used watching TV/mobile/computer (80%) as a stress buster, followed by binge eating (64%), exercise (44%), smoking (32%), do it yourself (DIY-23%), and meditation (17%).

Conclusion: SDPs are experiencing stress levels during this COVID-19 pandemic time. Male SDPs above 50 years and private practitioners showed higher levels of stress scores. An overall commonly used stress buster was smoking in males and meditation in females.

Keywords: dental practitioners, stress, stress busters, stress relievers, Saudi Arabia, source of information
INTRODUCTION

Stress is defined as an unpleasant state of emotional and physiological stimulation that individuals experience in circumstances that they distinguish as threatening or dangerous to their welfare.\(^1\) The recent coronavirus (COVID-19) has posed a threat to humankind due to its potential lethality. In the present scenario, dentists are exposed to stress and considered high-stress groups.\(^2\) Since dental professionals are in very vicinity to the patients’ oral cavity, saliva, and aerosol splatter, and they are at risk of acquiring COVID-19 infection.\(^3,4\) In the present situation of COVID-19, dental practitioners have been affected the most compared to other health care professions. In addition, anxiety, anger, confusion, insomnia, irritability, and post-traumatic symptoms have been reported to impact this pandemic outbreak.\(^5,6\) These psychological effects due to COVID-19 could lead to more harm than the contagion itself, and at the worst, it can affect the dental practitioners for the long term and limit services to the population.

The SARS epidemic in 2003 had a similar impact. It affected the psychological well-being of health care workers. It had instilled fears of financial loss, job insecurity, the uncertainty of the future, social exclusion, fear of infection, and contamination to family, friends, and colleagues.\(^7\) Lee and co-workers\(^7\) reported that the depression, anxiety, and post-traumatic stress in health care workers (HCWS) were more than that of the non HCWS after a year of SARS outbreak. The psychological effect of this outbreak on dental practitioners is complex. Stress can be beneficial and harmful. Mild to moderate levels of stress helps the individual to deal with the situation and also overcome it. However, if the stress is chronic and is not addressed, it can turn out to be harmful. It is human nature to find ways out of stress. In such an attempt, various coping mechanisms are sought by the individual. The coping mechanisms have been considered important for the stress-anxiety relationship.\(^8\) Various factors influencing the coping mechanism are ethnicity, culture, and socioeconomic characteristics.\(^9\) Of the many coping mechanisms, psychological and social assistance have been reported to improve healthcare workers.\(^10\) There is a lack of evidence in the existing literature addressing the stress levels among dental professionals from Saudi Arabia and the various coping mechanisms to combat the same. Various stress busters were reported in the literature that used to reduce stress. To date, there are no studies that stated that stress leaves and stress busters among dental practitioners. Hence, the
study was aimed to assess the stress levels, stress busters, and coping mechanisms among Saudi dental practitioners (SDPs) during the pandemic outbreak of the COVID-19.

METHODOLOGY

A cross-sectional questionnaire-based study was formulated to know the possible stressors, stress busters (stress relievers), and coping mechanisms adopted by the dental professionals during this COVID-19 pandemic. Self-administered questionnaire [Demographic-4; Source of information-1; Cohen stress- 10; stress coping mechanism-1; stress contributing factor -1; and stress busters-1(Figure. 1) was sent to SDP via Google forms. The ethical approval was obtained from the Majmaah University, Saudi Arabia. Only the completed questionnaire forms were considered for final analysis, and only responses from SDPs were used for the study's analysis. Dentists from other than Saudi Arabia and incomplete forms were removed from the final analysis. The obtained data were tabulated based on age, gender, qualification, and occupation. Cohen's stress score scale\textsuperscript{11} was used for stress evaluation, and the mean scores were compared based on age, gender, qualification, and occupation. Comparisons of the utilization of stress coping mechanisms and stress busters based on gender, age, and occupation were evaluated. Descriptive statistics were carried out using SPSS (IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp).

RESULTS

Among the 410 participants, only 206 of SDPs across Saudi Arabia submitted the completed questionnaire and evaluated it. Out of a total of 206 participants, 143 (69.4%) were male and 63 (30.6%) were females, with the most common age group of the respondent was 31-40 years 91 (44.2%) and the age group of 21-30, 41-50 and >50 years were 30 (14.6%), 67 (32.5%) and 18 (8.7%) respectively (Table 1). By qualification, 74(35.9%) were board-certified, 60(29.1%) were with masters, 42 (20.4%) were graduates, 24(11.7%) were with Ph.D., and 6(2.9%) were with a diploma. The majority of the practitioners, 67(32.5%) of them worked at private clinics, 53(25.7%) were working as a faculty who worked as private practitioners even, 43(20.9%) were faculty, 43(20.9%) were government practitioners (Ministry of Health). There is a psychological stress description among the dental practitioners towards COVID-19 during this pandemic period (Table 2). The mean stress score for males is 19.62±5.8, and 19.14±6.3 for females (P>0.05) and
males were affected more than females from stress due to the COVID-19 pandemic. SDPs above 50 years had high stress (25.06±7.4) as compared to other age groups (21-30 years -17.9±6; 31-40 years - 18.235± 5.7; and 41-50 years- 20.19± 5) and statistically significant difference (P<0.05) was evident among and within the age groups. At the occupation level, private practitioners showed high stress mean value of 22.67±4.7 than the government employees working in MOH (16.93±4.3) and faculty who were having private practice (20.26±5.4). On the other hand, academicians had a minor stress mean value of 16.05±7.2, and There was a statistically significant difference among and within the groups (P<0.05).

Among SDPs, 29% and 35% accessed scientific journals and websites for information regarding the COVID-19 pandemic, whereas 83% of the SDPs depended on the news, and 82% obtained the information from social media. The contributing factors for stress during post-pandemic dental practice demonstrated that most of the practitioner (90%) was worried about transmitting the virus and transmitting it to the less exposed members of the family and friends. 69.4% were stressed about transmitting the virus to the colleagues and supporting staff in the dental operatory. The other stressors in order were the insufficient supply of personal protective equipment (40.3%) followed by the fear of a decline in the number of patients turning up for consultations or treatment in the dental practice (39.3%) (Figure.2). Overall, 88% of dental practitioners said they were using a stress-coping mechanism to relieve stress from the COVID-19 pandemic. Among this, 69% were males, 48% of participants belong to 31-40 years of age group, 31% of private practitioners (Figure.3).

The majority of the SDPs used watching TV/ mobile/ computer (80%) as a stress buster, followed by binge eating (64%), exercise (44%), smoking (32%), do it yourself (DYI-23%), and meditation (17%) showed in Figure 4. Among the utilization of stress busters, males achieved higher scores than females in all stress busters (Figure .5). Among these, males used 96% of smoking as a stress buster, but only 5% of females used smoking. Watching TV/ mobile/ computer (46%) and exercise (44%) were higher in 31-40 years of SDPs, while binge eating (44%) and smoking (51%) were high in 41-50 years old SDPs (Figure. 5). SDPs at private practice achieved high-stress buster scores for overall stress busters evaluated in the study. The SDPs working in private practice, MOH, and faculty with private practice used smoking as a common stress buster and rarely depend on meditation. While faculties working in academics

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were rarely dependent on smoking as a stress buster, they frequently depend on meditation (Figure.5).

**DISCUSSION**

There have been studies as early as the 1980s concerning the stress experienced by dental professionals.\(^8\),\(^9\) This study was designed to evaluate the stress caused by COVID-19 among SDPs, the possible contributing factors, and the stress busters at the individual level based on gender, age, and occupation. A questionnaire survey was chosen for the present study as an efficient means to reach out to the large population of dental professionals throughout the Kingdom of Saudi Arabia during a pandemic to collect data, and the questionnaire was provided in Arabic and English languages. COVID-19 was affirmed as a pandemic on 11\(^{th}\) March 2020 by WHO, and Saudi Arabia imposed all the measures to control the contagion's spread.\(^12\) Facilities like entertainment, social institutions, religious gatherings, and educational institutions were also restricted or closed in the attempt of lockdown in the second week of March 2020.\(^13\) The unprecedented situation has forced us to adopt some new norms all at once. This immediate shift from the usual routine affected the social and mental well-being of the public and mostly the health care workers.\(^14\) The nature of COVID-19 novel viral infection of being easily transmitted added to its fatality has instilled fears among the health care professionals. They comprise a population of health care workers who work closely to the patient environment and are exposed to bodily fluids, making them vulnerable to contract this infection.\(^3\),\(^15\),\(^16\) Dentists are considered to belong to the high-stress group, and regarding the transmission nature of the COVID-19 pandemic, they also happen to be vulnerable to contracting the virus.

Another observation from the present study was that the population depended on information regarding COVID-19 on the news (83%) and social media (82%) more than trusted sources such as the official websites (35%) and scientific journals (28.6%). The strategies to handle this pandemic impact patients and the policies and have been changing almost regularly. In such a dynamic scenario,\(^17\) advised restricting the information from other sources than from the official websites and from the subject experts to about once or twice a day to check the anxiety levels and beware of any misinformation more harm. A Taiwanese study reported similar results where the study population utilized internet media (69%). The authors observed that COVID-19
associated information recurrently from social media, traditional media, and friends made SDPs more worried.\textsuperscript{18} The Taiwan study was conducted for 20 years, and the present study was conducted in SDPs, so the results were not comparable. Nonetheless, there is a need to evaluate media sources' influence on healthcare professionals' stress levels. In the present study, local news authorities and social media positively impacted SDPs in providing information on COVID-19.

Studies have reported that the female population's stress levels were more and also seen to be more vulnerable compared to the male population among the general population and students.\textsuperscript{19,20} In contrast, the present study observed that the male SDPs was more stress mean scores than the female SDPs, and the results were statistically significant. The prior Saudi study used IES-R (Event Scale-Revised) and DASS-21 (Depression, Anxiety, and Stress Scale), scales to evaluate the Saudi population's stress scores.\textsuperscript{20} The American study used an anonymous, longitudinal design based on the best practice used by Amazon Turk workers.\textsuperscript{21} However, the present study evaluated stress levels based on Cohen's stress. Both the studies used an online platform to send the evaluation forms to the participants, and the present study used Google forms. The study population was SDPs hence the results were not comparable with prior studies.

SDPs of above 50 years of age were under high stress (25.06±7.4) as compared to other age groups (P<0.05), the findings were consistent with the study conducted. It was expected because it had have been reported that people more than 60 years are at an utmost risk of transmitting the COVID-19. The results from the present study support that even SDPs of older age also felt stress. Dentists were advised to defer any non-emergency treatment, which led to clinics/hospitals' closure and affected most dental professionals' income source.\textsuperscript{23,24} A Serbian study\textsuperscript{24} suggested that front-line health care professionals developing higher levels of depression, anxiety, and stress than second-line health care teams. The authors used the Generalized Anxiety Disorder Scale to measure anxiety, the Perceived Stress Scale to measure stress, and the Beck Depression Inventory to measure depression. However, in the present study, the Cohen stress scale was used to assess the stress levels among the SDPs.

At the occupation level, private practitioners showed high stress mean value of 22.67±4.7 than the government employees working in MOH (16.93±4.3) and faculty who were having private
practice (20.26±5.4). Academicians had the most minor stress mean value of 16.05±7.2. During post-pandemic dental practice, the contributing factors for stress demonstrated that most practitioners (90%) were worried about contracting the virus and transmitting it to the less exposed family and friends. Sixty-nine percent were stressed about transmitting the virus to the colleagues and supporting staff in the dental operatory. The other stressors were the insufficient supply of personal protective equipment (40.3%), followed by the fear of declining the number of patients turning up for consultations or treatment in the dental practice (39.3%). As stress is a natural response to any threat or danger, coping mechanisms are behaviors and thoughts we adopt to respond/overcome stressful situations.8,10,24 Coping changes cognitive and behavioral efforts to manage specific external and internal demands exceeding or taxing a person's resources.25 Coping mechanisms will help and diminish stressful circumstances by identifying a possible solution, henceforth fighting stress or distracting oneself from stressful situations.26,27 The survey included a section about the coping mechanism and the participants' stress buster during the pandemic. Overall, 88% of SDPs said they were using a stress-coping mechanism to relieve stress from the COVID-19 pandemic. Among these, 69% were males, 48% of participants belong to the 31-40 years of age group, while 31% of private practitioners. The most common stress buster was watching electronic media (TV/media/ Computers), entertainment (80.1%). Bilal and coworkers28 also observed that 95.5% of male participants smoked to overcome stress. The other stress busters reported were binge eating, exercise, DIY, and meditation.

A closer examination of what is transpiring in context and the prior studies27,29,30 had been found smoking as a way of taking a study break or refocusing and smoking as a way of re-inputting rejoicing the end of an examination. The present study found that SDPs in academics and private practice used smoking as a stress buster. Almost similar findings were evident in an Ethiopian study31 where academicians showed a higher tendency to smoking as stress busters. The authors emphasized that job control, job demand, and cigarette smoking to ease occupational stress factors are more common among academicians. Taha and co-workers32 observed that during the H1N1 pandemic, individuals with an intolerance to uncertainty reportedly experienced more anxiety. Hence, during this period of uncertainty about the period that the pandemic will persist, if there could be an effective vaccine and the impact it will leave, anxiety is just a response to the uncertainty. The previous outbreak of SARS in 2002 and MERS in 2012 has impacted healthcare workers' psychological well-being. It also resulted in post-pandemic
Although the previous pandemics have prepared society to deal with a similar situation, and COVID-19 has been challenging to expose dental professionals to a potential risk of contracting the infection and increasing psychological stress. The health care fraternity needs some thought and care to fight the stress-induced due to this pandemic. The authors developed a stress reduction model (Figure. 6), adopted from the model proposed by Khosravi and co-workers. This stress reduction model should be implemented to address and manage the psychological stress among health care workers during such a crisis. The model could be used in the future or built upon when faced with a challenge/outbreak/pandemic. The sample size was considerably less with a short period of study utilizing a close-ended questionnaire. Hence the results were not generalized. These factors were considered to be the limitation of the present cross-sectional survey.

CONCLUSION

SDPs are experiencing stress levels during this COVID-19 pandemic time. Males, practitioners above 50 years, and private practitioners showed higher levels of stress scores. An overall commonly used stress buster was watching TV/mobile/computer while smoking was common in males, and meditation was in females.

Contributors: All authors have discussed the planning and the framework of the reflection notes. All designed the theoretical framework and reviewed the literature, and wrote the report.

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Competing interests: None
Acknowledgments:

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REFERENCES


Table 1: Demographic information of the participants.

<table>
<thead>
<tr>
<th>Details</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>63</td>
<td>30.6%</td>
</tr>
<tr>
<td>Female</td>
<td>143</td>
<td>69.4%</td>
</tr>
<tr>
<td><strong>Age (Years)</strong></td>
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<td></td>
</tr>
<tr>
<td>20-30</td>
<td>30</td>
<td>14.6%</td>
</tr>
<tr>
<td>31-40</td>
<td>91</td>
<td>44.2%</td>
</tr>
<tr>
<td>41-50</td>
<td>67</td>
<td>32.5%</td>
</tr>
<tr>
<td>&gt;50</td>
<td>18</td>
<td>8.7%</td>
</tr>
<tr>
<td><strong>Qualification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Board certified</td>
<td>74</td>
<td>35.9%</td>
</tr>
<tr>
<td>Diploma</td>
<td>6</td>
<td>2.9%</td>
</tr>
<tr>
<td>Graduate</td>
<td>42</td>
<td>20.4%</td>
</tr>
<tr>
<td>Masters</td>
<td>60</td>
<td>29.1%</td>
</tr>
<tr>
<td>PhD</td>
<td>24</td>
<td>11.7%</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private practitioners</td>
<td>67</td>
<td>32.5%</td>
</tr>
<tr>
<td>Faculty</td>
<td>43</td>
<td>20.9%</td>
</tr>
<tr>
<td>Ministry of health</td>
<td>43</td>
<td>20.9%</td>
</tr>
<tr>
<td>Faculty and private practitioners</td>
<td>53</td>
<td>25.7%</td>
</tr>
</tbody>
</table>
Table 2. Comparison of overall Cohen stress mean scores based on gender, age and occupation.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ±SD</td>
<td>19.62±58</td>
<td>19.14±6.3</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Age (Years)</td>
<td>20-30</td>
<td>31-40</td>
<td>41-50</td>
</tr>
<tr>
<td>Mean ±SD</td>
<td>17.90±6.0</td>
<td>18.35±5.7</td>
<td>20.19±5.0</td>
</tr>
<tr>
<td>Occupation</td>
<td>Private practitioners</td>
<td>Faculty</td>
<td>Ministry of health</td>
</tr>
<tr>
<td>Mean ±SD</td>
<td>22.67±4.7</td>
<td>16.05±7.2</td>
<td>16.93±4.3</td>
</tr>
</tbody>
</table>
Figure 1. Pictorial representation of stress busters (stress relief activities) utilized in the study (A. Binge eating, B. meditation, C. Do It Yourself, D. Exercise, E. Smoking, and F. Watching TV/ computers)
Figure 2. Description of contributing factors for stress during dental practice post-COVID-19 pandemic outbreak
Figure 3. Saudi dental practitioners’ responses to question on applying any coping mechanism for relieving stress.
Figure 4. Details of stress busters (stress relief activities) utilized by Saudi dental practitioners
Figure 5. Details of stress busters (stress relief activities) utilized by Saudi dental practitioners based on gender, age, and occupation

<table>
<thead>
<tr>
<th>Activity</th>
<th>Male</th>
<th>Female</th>
<th>20-30</th>
<th>31-40</th>
<th>41-50</th>
<th>&gt;50</th>
<th>Private practitioners</th>
<th>Faculty</th>
<th>Ministry of Health</th>
<th>Faculty &amp; Private practitioners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watching TV/mobile/Computer</td>
<td>67%</td>
<td>33%</td>
<td>7%</td>
<td>46%</td>
<td>37%</td>
<td>10%</td>
<td>34%</td>
<td>10%</td>
<td>21%</td>
<td>27%</td>
</tr>
<tr>
<td>Engage eating</td>
<td>72%</td>
<td>28%</td>
<td>9%</td>
<td>39%</td>
<td>44%</td>
<td>8%</td>
<td>31%</td>
<td>18%</td>
<td>21%</td>
<td>30%</td>
</tr>
<tr>
<td>Exercise</td>
<td>72%</td>
<td>28%</td>
<td>19%</td>
<td>44%</td>
<td>12%</td>
<td>13%</td>
<td>35%</td>
<td>24%</td>
<td>30%</td>
<td>22%</td>
</tr>
<tr>
<td>Smoking</td>
<td>95%</td>
<td>5%</td>
<td>9%</td>
<td>54%</td>
<td>51%</td>
<td>6%</td>
<td>25%</td>
<td>8%</td>
<td>79%</td>
<td>59%</td>
</tr>
<tr>
<td>Do it yourself</td>
<td>68%</td>
<td>32%</td>
<td>19%</td>
<td>36%</td>
<td>14%</td>
<td>11%</td>
<td>47%</td>
<td>21%</td>
<td>13%</td>
<td>19%</td>
</tr>
<tr>
<td>Meditation</td>
<td>63%</td>
<td>37%</td>
<td>31%</td>
<td>35%</td>
<td>20%</td>
<td>17%</td>
<td>51%</td>
<td>29%</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Social support</td>
<td>Emotional support</td>
<td>Financial support</td>
<td>Health care/Professional support</td>
<td></td>
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</table>
| • Positive work environment  
• Regular physical activity  
• Meditation  
• Restrict and cautiously derive news from trusted sources if it is from the experts.  
• Consider leave or shorter working hours for vulnerable sections like age above 50 years and/or preexisting or prone to psychologic stress. | • Stay in contact with family, friends and colleagues through video calling or similar means.  
• Psychologists counselling.  
• Do not hesitate to seek help from Psychologists. | • Uplift the morale by giving incentives.  
• Regular hikes in the salary, without delays in payments.  
• Provide for job security during and after the pandemic.  
• Contracting the infection should not risk the job.  
• Quarantine period of the dentist in case of risk of infection should be considered on duty, the pay pattern should not be affected.  
• Financial support from the higher authorities should reach the local dental associations and societies in time to the dental professionals affiliated to the governing bodies. | • Form a team effective work exclusively for developing strategies and safety measures for the pandemic.  
• Divide the work hours among colleagues and schedule into shifts to avoid burnout.  
• Provide for easy access to healthcare to the dentist and his/her family.  
• Adequate supply of PPE must be mandatory.  
• Access to upgradation of knowledge regarding the pandemic and measures taken to fight the same should be done regular and constantly. |

**Figure 6.** Proposed model based on recommendations of Khosravi and co-workers (2020)\(^\text{34}\)