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Physical and Psychological Health Challenges Among Dental Practitioners During the COVID-19 Pandemic: A Study from Chattogram City

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Abstract

Background: Dental practitioners were among the most vulnerable professionals throughout the COVID-19 pandemic due to their exposure to aerosols and close patient contact. This study assessed the physical and psychological health challenges faced by dental practitioners in Chattogram City. **Methods:** This cross-sectional study was conducted amongst 96 dental practitioners of Chattogram city, from May 2023 to April 2024. Data were collected using a structured, pretested online questionnaire covering demographic details, physical symptoms, psychological impacts, and infection-control practices in dental clinics. Descriptive statistics and Chi-square/ Fisher's exact tests were applied as appropriate ($p < 0.05$ considered statistically significant). **Results:** The majority of participants were male (57.3%), and within the 31–40 age group (46.8%). Breathing difficulties (70.8%), fatigue and body ache (59.4%), and headaches (57.3%) were the most common physical complaints. Musculoskeletal pain and dermatological problems related to prolonged PPE use were also prevalent. Psychologically, 81.2% reported anxiety regarding infection transmission to family, and 65.6% feared treating patients in proximity. Notably, 76.0% of practitioners reported COVID-19 infection (self or family). Female practitioners were more likely to report headaches and musculoskeletal pain ($p < 0.05$), while dentists over 40 years reported significantly greater anxiety affecting treatment decision-making ($p = 0.035$). No significant association was noticed between clinic air-control measures and infection status. **Conclusion:** Dental practitioners in Chattogram experienced substantial physical discomfort and psychological stress throughout the COVID-19 pandemic, with significant gender- and age-related differences. These conclusions highlight the necessity for specific occupational health support and preparedness strategies for future pandemics.

Keywords: Dental practitioners, COVID-19, physical health, psychological health, anxiety, Bangladesh

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Introduction

The COVID-19 pandemic posed unexpected pressure on healthcare personnels, including Bangladesh Journal of Medical Education 2026; 17(1); Nasrin et al., publisher and licensee Association for Medical Education. This is an Open Access article which permits unrestricted non-commercial use, provided the original work is properly cited.

dental practitioners. Dental practice involves close interaction with their patients, frequent exposure to patients' saliva and aerosols, and

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procedures that can generate airborne particles. All of these increase the likelihood of viral transmission. Thereby, dental professionals were at high occupational risk during the pandemic. There were guidelines from World Health Organization (WHO) for the dental practitioners regarding modifications in clinical set up. The modifications include compulsory usage of personal protective equipment (PPE), and laborious disinfection routines^{1,2}. These increased physical and mental workload, contributing to fatigue and musculoskeletal strain³. Long-term face mask use has been demonstrated to have a number of detrimental impacts such as headaches, hypoxic situations, blurred eyesight, and altered voice and speech characteristics, rashes⁴, sore throat, breathing difficulties, and nasal discomfort⁵.

In addition to the physical risks posed by potential COVID-19 exposure, There was a decline in quality of life and physical health scores among dental professionals, especially for those with additional duties or less experience^{6,7}. Dental practitioners also encountered several operational difficulties such as reduced patient volume, financial uncertainties, and rapidly changing infection control protocols⁸. These factors contributed not only to physical symptoms, such as musculoskeletal pain, fatigue, respiratory difficulty, and weight fluctuations, but also to psychological burdens including anxiety, stress, and emotional exhaustion. During the pandemic, oral health-care workers showed amplified psychological distress, originating from fear of catching COVID-19 infection, financial strain, unavailability of protective equipment and increased workload. This was more grave among those with existing comorbidities^{9,10}.

So, the dental practitioners faced remarkable physical health risks and psychological stress, especially in resource-constrained settings. Chattogram City, a major urban center in Bangladesh, witnessed considerable disruption in dental healthcare delivery during the pandemic. However, limited empirical data exists on how this crisis affected the physical and psychological health of dental practitioners in this region. Understanding these health challenges is crucial not only for immediate support but also for developing resilience strategies for future health emergencies. This study aims to depict the physical and psychological health conditions of dental practitioners, who adopted clinical setup modifications as directed by WHO, in Chattogram City during the COVID-19 pandemic.

Methods

This cross-sectional study was conducted in Chattogram City, Bangladesh, between May 2023 and April 2024. The study targeted registered dentists affiliated with the Bangladesh Medical & Dental Council (BMDC) and members of the Bangladesh Dental Society (Chattogram City) who were engaged in in-person clinical practice, either in private, government, or mixed sectors during the pandemic, and also actively modified their clinical working protocols to meet pandemic-related safety requirements. Practitioners who were on long-term leave or provided online consultations only, during the study period were excluded. A convenience sampling method was applied to select eligibility participants. Sample size was calculated as 96. Data were collected through Google form which contained pretested structured questionnaire. The questionnaire was adapted from a previous study¹¹ and relevant literature.

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Pretesting was performed with 10 dentists (10% of the sample size) to ensure clarity and validity. Key variables were demographic, self-reported physical symptoms and illnesses, and self-reported levels of stress and anxiety.

Collected data were cleaned, and checked for errors, then analyzed with IBM SPSS Statistics software version 27. Descriptive statistics (frequency, percentage) were used to summarize the physical and psychological health conditions. With a significance threshold of $p < 0.05$, inferential analysis (e.g., Chi-square or Fisher's exact test) was applied to explore associations between health challenges and socio-demographic variables.

Ethical approval was obtained from the Institutional Review Committee of Bangladesh University of Health Sciences (BUHS). Participants provided informed consent electronically prior to participation. Confidentiality of data, and anonymity of the respondents were maintained strictly during the study. No individual-level data were disclosed.

Results

A total of 96 dental practitioners took part in the study with ages ranged from 27 to 70 years which was Males (57.3%) predominant. The major proportion of respondents (46.8%) belonged to the 31–40-year age group. With respect to academic qualifications, two-thirds (66.7%) were BDS graduates with no postgraduate degrees, whereas the rest had

attained postgraduate degrees in various dental specialties. The majority of respondents (91.7%) reported being employed in private clinical practice.

This study shows that dental practitioners experienced a wide range of physical and psychological health problems through the COVID-19 pandemic. Breathing difficulties were reported as the most frequent (70.8%) problem. Different physical and psychological challenges were more pronounced among males. Females reported headache, and exaggerated musculoskeletal pain much more than men, which were also statistically significant. Nearly two-thirds of dentists felt anxious about operating in close proximity to patients, and this was significantly more common among females. A large majority worried about being infected themselves or transmitting the infection to their families. Three-fourths of the participants (76.0%) reported of being caught by COVID-19 at some point (Table I).

Chi-square test was done between health impact related variables and age. Only significant association was between age group and 'anxiety having impact on decision making and treatment planning'. Other associations were not statistically significant. Dentists 'over 40 years' were more likely to report that anxiety affected their clinical decision-making and treatment planning compared to doctors 'under 40 years' ($p = 0.035$).

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Table I: Association of Health impact (due to COVID-19 pandemic) with sex (N=96)

		Male (% of row total)	Female (% of row total)	Total (% of N)	p- value
Physical Health impacts					
Difficulty in breathing	No	20 (71.4%)	8 (28.6%)	28 (29.2%)	0.072
	Yes	35 (51.5%)	33 (48.5%)	68 (70.8%)	
Headache	No	31 (75.6%)	10 (24.4%)	41 (42.7%)	0.002*
	Yes	24 (43.6%)	31 (56.4%)	55 (57.3%)	
Fatigue and Body ache	No	25 (64.1%)	14 (35.9%)	39 (40.6%)	0.264
	Yes	30 (52.6%)	27 (47.4%)	57 (59.4%)	
Excessive sweating and related cough and allergic skin infection	No	32 (60.4%)	21 (39.6%)	53 (55.2%)	0.497
	Yes	23 (53.5%)	20 (46.5%)	43 (44.8%)	
Hypertension	No	50 (56.8%)	38 (43.2%)	88 (91.7%)	0.90
	New onset	5 (83.3%)	1 (16.7%)	6 (6.2%)	
	Exaggerated	0 (0.0%)	2 (100.0%)	2 (2.1%)	
Weight change	No change	37 (56.9%)	28 (43.1%)	65 (67.7%)	1.000
	Weight gain	12 (57.1%)	9 (42.9%)	21 (21.9%)	
	Weight loss	6 (60.0%)	4 (40.0%)	10 (10.4%)	
Musculoskeletal pain (onset/exaggerated)	No	39 (63.9%)	22 (36.1%)	61 (63.5%)	0.000*
	New onset	15 (62.5%)	9 (37.5%)	24 (25.0%)	
	Exaggerated	1 (9.1%)	10 (90.9%)	11 (11.5%)	
Got infected by COVID	No	17 (73.9%)	6 (26.1%)	23 (24.0%)	0.340
	Yes, only Dental practitioner	7 (50.0%)	7 (50.0%)	14 (14.6%)	
	Yes, only family member	5 (50.0%)	5 (50.0%)	10 (10.4%)	
	Yes, Both	23 (46.9%)	26 (53.1%)	49 (51.0%)	
Nature of strain	Physical	6 (54.5%)	5 (45.5%)	11 (11.5%)	0.150
	Emotional	14 (77.8%)	4 (22.8%)	18 (18.8%)	
	Both	35 (52.2%)	32 (47.8%)	67 (69.7%)	
Psychological impacts					
Anxiety of close proximity	No	24 (72.7%)	9 (27.3%)	33 (34.4%)	0.031*
	Yes	31 (49.2%)	32 (50.8%)	63 (65.6%)	
Anxiety to hear co-workers to be infected with COVID	No	12 (66.7%)	6(33.3%)	18 (18.8%)	0.436
	Yes	43 (55.1%)	35(44.9%)	78 (81.2%)	
Anxiety of getting infected or carrying infection to family	No	13 (72.2%)	5 (27.8%)	18 (18.8%)	0.192
	Yes	42 (53.8%)	36 (46.2%)	78 (81.2%)	
Anxiety had impact on decision making and treatment planning	No	23 (57.5%)	17 (42.5%)	40 (41.7%)	1.000
	Yes	32 (57.1%)	24 (42.9%)	56 (58.3%)	

* p<0.05= significant

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To ensure air quality in dental clinics, practitioners adopted one or more of five measures: limiting aerosol-generating procedures, using high-volume suction, installing HEPA filters, applying vacuum suction, and avoiding air conditioner use. Each adopted measure was given a score of one, resulting in a total conceivable score ranging from 0 to 5. This cumulative score was compared with whether practitioners were infected with COVID-19, but no statistically significant association was found. Similarly, when each individual measure was analyzed separately against infection status, none showed a significant association.

Discussion

The respondents of the study actively accommodated the safety protocols, as instructed by WHO (2), for their clinical practices. The protocols include-

- Patient screening and crowd control (history taking, maintaining single patient in waiting room, and maintaining social distancing)
- Infection control and hygiene practices (maintaining Hand hygiene, anti-microbial mouth rinse, cleaning all potentially contaminated surfaces, and using Rubber Dam for isolation)
- Personal protective measures (using personal protective wear, using N-95 or another special mask, and using protective surgical glass/face shield)
- Aerosol control strategies (limiting aerosol-generating procedures, using high-volume suction, installing HEPA filters, applying vacuum suction, and omitting air conditioner use)

In present study difficulty of breathing was experienced by 70.8% (n=68) respondents

followed by experiencing fatigue and body ache by 59.4% (n=57) respondents. Other problems mentioned were headache (57.3%), excessive sweating and related cough and allergic skin infection (44.8%), musculoskeletal pain (36.5%), weight change (32.3%) and hypertension (8.3%).

Wearing a face mask has become both necessary and required since the epidemic began in order to protect us from COVID-19. Healthcare professionals (HCPs) were obliged to wear PPE for prolonged duration of time as a result of the pandemic. Long-term face mask use has been demonstrated to have a number of detrimental impacts. Extended usage of masks and PPE was linked to negative skin and facial impacts such redness, rashes, irritation, and acne. Additionally, wearing masks caused headaches, hypoxic situations, blurred eyesight, and altered voice and speech characteristics⁴. Contact dermatitis, increased pore size and wrinkles, redness, itching, urticarial rashes, and acne suggesting allergic responses were the most common adverse skin reactions. When compared to surgical masks, N95 masks were linked to more aggravating skin reactions^{12,13}. Extended mask wear caused mouth breathing in between suffocating episodes. Dentists who wore head- or ear-supported masks reported experiencing dry mouth and nose, itching, prickly heat, and ear pain and redness behind the ears. Other negative effects included speaking loudly, headaches, mastication muscle strain, fogging and misplacing glasses, and difficulties hearing. It is advised to take periodic pauses from work to avoid these consequences¹⁴. Wearing mask for four hours or more was associated with certain symptoms, including sore throat, breathing difficulties, sweating around the mask, and nasal discomfort⁵. Extended usage of FFP2 respirators was linked to reasonable breathing

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difficulties (63.5%), reasonable concentration issues (54.3%), severe effort and discomfort (50.8%), headaches (47.5%), resulting in reduced capacity for work (85.5%)¹⁵. By making adjustments to clinical workflows and putting practice modification strategies into place to keep patients and staff safe, dental clinics can lessen headaches following COVID-19¹⁶. Committee-based dental patient prioritizing, a multi-layered screening procedure, duty rotations, and adjusted clinical area protocols can all help reduce the negative consequences of protective measures¹⁷. From a study among 309 dental professionals, from different parts of India, majority of the respondents mentioned headaches, sweating, blurred vision, and difficulty breathing as common discomforts. Breathing difficulties and headaches were more strongly linked to female dentists ($p < 0.05$). Breathing issues were linked to N95 wear (56%)¹⁸.

In present study 65.6% dentist ($n=63$) suffered from COVID-19 infection with or without their family member/s. According to the findings of an Iranian study, 18 (7%) of the participants claimed having seen COVID-19 symptoms in themselves, and 3 (1%) reported having the illness. Additionally, 9 (3%) of the individuals indicated that their aides had the symptoms¹⁹. This pandemic, undoubtedly, is an unremitting reality in our sceneries, as evidenced by the fact that just 1.1% of practitioners in Italy referred positive cases to COVID-19, while more than two-thirds reported having not less than one patient, aide, or acquaintance who confirmed positive after test. The majority of practitioners were afraid of getting infections, but they haven't had their concerns about their patients getting infections examined²⁰.

In the present study about 18.8% respondents ($n=18$) opined that the stress they endured was physical and 11.5% ($n=11$) opined for

emotional stress. Maximum response (69.8%) was for both physical and emotional stress. Another Bangladeshi study discovered that because of the epidemic, the majority of the dentists (93.1%) expressed anxiety when treating patients²¹.

According to a study conducted across three Indian states, men and people under 30 years of age were expected to be acknowledged as being gloomy. Additionally, anxiety of catching COVID-19 from patients resulted in greater depression scores for practitioners. The least likely practitioners to be depressed were those who expressed less worry about their work or practice after the lockdown during COVID-19 and those who were capable of paying their bills throughout the lockdown²². An Iranian study revealed that almost 50% of their individuals experienced anxiety and depressive symptoms¹⁹. Through the COVID-19 epidemic, it has been reported that healthcare personnel were experiencing significantly higher levels of emotional stress than the general public²³. The primary apprehensions among medical personnel through pandemics were found to be amplified workload, dealing thru constantly altering protocols, self-isolation, social distancing, utilizing PPE, and considering for patients who were becoming worse²⁴.

Nearly 85% of dentists in Italy said they were concerned about getting sick while doing clinical work. According to GAD-7 (General Anxiety Disorder-7) assessment, nine percent of respondents reported having severe anxiety. Concern, anxiety, and fear were also felt in conjunction with the assessment of this detrimental effect respectively by 70.2%, 46.4% and 42.4% of the respondents²⁰. Self-report questionnaires are a valuable tool for measuring anxiety, and both patients and dental professionals have experienced this^{25,26}.

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In present study majority of the participants (81.3%) felt anxious when they heard that any of their coworker has been ill with COVID-19 and felt anxious or stressed of getting infected or carrying infection to family. About 65.6% responded for anxiety of providing treatment from close proximity. About 58.3% opined that anxiety had impact on decision making and treatment planning. The majority of dentists in Hyderabad, Pakistan (83.17%) fear catching COVID-19 from a patient or colleague²⁷.

From 16 different Indian states, 239 participants answered a survey; 69% of them expressed concern about contracting an infection from a patient who visited their clinics. Only 7.48 percent of those, who treated patients, experienced fear while 47.1% believed that it would be best to hold off on practicing until there are less COVID-19 patient instances. About 81% of participants were afraid that they will bring the infection home from the clinic and infect their family, accounting for 54.3% of participants' feelings of fear and anxiety during patient interactions. In the unlikely event that they become infected, 59.5% of people were worried about the expense of treatment, and 40% were terrified of being placed under quarantine²⁸.

This is in line with research conducted by Iraqi dentists, which showed that over 80% of participants expressed fear of contracting COVID-19. Female dentists and dentists who were younger had higher recorded anxiety levels. Of the dentists, more than 60% said they were terrified to treat any patients. Furthermore, almost 72% of the dentists expressed discomfort for having a close relationship with the patients. The participants' most frequent response (94%) was linked to their fear of infecting their family members at home,

followed by learning a co-worker's COVID-19 infection (90%)²⁹.

Approximately two-thirds (78%) of general dentists, surveyed across 30 nations, expressed fear and anxiety due to the severe consequences of COVID-19. About 87% of participants expressed concern about catching COVID-19 from a coworker or a patient. About 90% of the medical staff felt uneasy when tending to a patient who was coughing or who might have COVID-19 infection. Over 72% of participants reported feeling uneasy when conversing with patients nearby, and 92% expressed concern about potentially infecting their families with the infection from the dental office. Owing to the COVID-19 pandemic's effects on people, dental professionals worldwide are experiencing worry and terror in their work in spite of having a higher degree of education and practice³⁰.

These results make sense because dentists are among the greatest risk groups due to the fact that their profession produces aerosols and droplets, which are thought to be the primary means of virus transmission³¹. Given the rising infection and death rates, it is reasonable to assume that the high levels of worry experienced by these dentists are normal human reactions during a pandemic.

Pandemics naturally cause psychological effects like worry and anxiety, particularly when the number of afflicted people and death rates are rapidly rising. Research on prior outbreaks of related communicable diseases, for instance severe acute respiratory syndrome (SARS), portrayed that a number of factors, such as fear of contracting the disease while dealing an diseased patient or transmitting infection to a family member, can cause

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psychological trauma among healthcare professionals^{32,33}. Furthermore, the lack of an approved vaccination or therapy increases worry when one considers catching the illness. Healthcare professionals who treat sick patients on a regular basis are more likely to catch infectious infections, which has a severe psychological impact³⁴. A huge portion of dentists are scared to treat patient having questionable symptoms. Given how quickly COVID-19 has spread to so many people in practically every nation, patients' fears of spreading the virus from one of them are understandable³⁰.

Bringing illnesses from their dental practices to their families is another real concern that dentists have. On different surfaces, the corona virus can survive for a few hours or several days. Its lengthy incubation time before to the onset of symptoms make it more challenging to contain its spread^{30,35}.

The GAD-7 test was used in Italy to evaluate the psychological consequences of COVID-19. This exam gauges the degree as well as presence of anxiety symptoms. A score of 0 to 4 was given to each response category (0 being "not at all" and 4 being "extremely/intensely"). Most said they were mildly (41%) or moderately (23.9%) afraid while thinking about COVID-19. Of those surveyed, the common responses were feeling lightly (37.4%) followed by moderately apprehensive (23.6%), with only 6.2% reporting acute anxiety. Regarding levels of concern, responses ranged from moderate (29.8%) to light (26.4%), just 16% reported feeling extremely concerned. Of those surveyed, just 12.6% reported being extremely depressed and 25.3% reported

feeling no melancholy at all. Just 9.3% of respondents reported feeling extremely angry, while 44.1% reported feeling no anger at all. Overall, these findings show that with a mean GAD-7 score of 6.56 ± 4.48 , the general degree of anxiety was modest overall²⁰.

Conclusion

This study portrays that dental practitioners in Chattogram City, who implemented WHO recommended clinical setup modifications, experienced a variety of physical and psychological health problems during the COVID-19 pandemic. Respiratory discomfort, fatigue, headaches, and musculoskeletal pain were common physical issues, while anxiety regarding infection risks, especially transmitting the virus to family was a major psychological burden. A significant proportion of practitioners caught COVID-19 despite implementing preventive strategies, underscoring the high occupational risk of dental practice. Female practitioners and older dentists appeared more vulnerable to specific health impacts. The findings emphasize the urgent need for comprehensive occupational health frameworks, mental health interventions, and vigorous infection-prevention protocols to safeguard dental professionals in present and future pandemics.

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References

- Summary of ADA Guidance During the COVID-19 Crisis | American Dental Association [Internet]. [cited 2024 Mar 14]. Available from: <https://www.ada.org/about/press-releases/2020-archives/summary-of-ada-guidance-during-the-covid-19-crisis>.
- Considerations for the provision of essential oral health services in the context of COVID-19 [Internet]. [cited 2024 Mar 5]. Available from: <https://www.who.int/publications-detail-redirect/who-2019-nCoV-oral-health-2020.1>.
- Sharifi M, Asadi-Pooya AA, Mousavi-Roknabadi RS. Burnout among Healthcare Providers of COVID-19; a Systematic Review of Epidemiology and Recommendations : Burnout in healthcare providers. *Arch Acad Emerg Med*. 2020;9:e7. doi: 10.22037/aaem.v9i1.1004.
- Guleria A, Krishan K, Sharma V, Kanchan T. Impact of prolonged wearing of face masks - medical and forensic implications. *J Infect Dev Ctries*. 2022;16 10:1578–1587. doi: 10.3855/jidc.16618.
- Neelam S, Natasha G, Rana A, Singh S. Effect of Prolonged Use of Face Masks in Dental Professionals during COVID-19. *Asian Pac J Health Sci*. 2022;9:156–160. doi: 10.21276/apjhs.2022.9.4S.30.
- Pai S, Patil V, Kamath R, Mahendra M, Singhal DK, Bhat V. Work-life balance amongst dental professionals during the COVID-19 pandemic—A structural equation modelling approach. *Mitra P, editor. PLOS ONE*. 2021;16:e0256663. doi: 10.1371/journal.pone.0256663.
- Arat Maden E, Özen B, Altun C. The effect of COVID-19 pandemic on life quality of dental professionals. *J Health Sci Med*. 2022;5:274–281. doi: 10.32322/jhsm.1004942.
- Uziel N, Gilon E, Meyerson J, Levin L, Khehra A, Emodi-Perlman A, Eli I. Dental personnel in Israel, Canada, and France during the COVID-19 pandemic: attitudes, worries, emotional responses, and posttraumatic growth. *Quintessence Int*. 2021;52:444–453. doi: 10.3290/j.qi.b936999.
- Chaudhary FA, Fazal A, Ahmad B, Khattak O, Hyder M, Javaid MM, Iqbal A, Issrani R. The Impact of COVID-19 Pandemic on the Psychological Health and Dental Practice of Oral Healthcare Workers: A Scoping Review. *Risk Manag Healthc Policy*. 2022;Volume 15:1421–1431. doi: 10.2147/RMHP.S370125.
- Abedi N. Psychological effects of the COVID-19 pandemic on dentistry: A systematic review study. *J Educ Health Promot*. 2021;10:311. doi: 10.4103/jehp.jehp_1637_20.
- Parameswaran M, Mohanan RP, Prajitha KC, Sam Joseph VG, Sreeja J. Paradigm Shift in Dental Practice Ergonomics During Coronavirus Disease 2019 (COVID-19) and Its Effects on Dental Practitioners of Kerala: A Cross-Sectional Study. *Int J Oral Care Res*. 2021;9:79. doi: 10.4103/INJO.INJO_24_21.
- Park S, Han J, Yeon YM, Kang NY, Kim E, Suh B. Long-term effects of face masks on skin characteristics during the COVID-19 pandemic. *Skin Res Technol*. 2022;28:153–161. doi: 10.1111/srt.13107.
- Darlenski R, Tsankov N. COVID-19 pandemic and the skin: what should dermatologists know? *Clin Dermatol*.

Original Article

- 2020;38:785–787. doi: 10.1016/j.clindermatol.2020.03.012.
14. Karemore T, Motwani M, Karemore V, Hotwani K, Banubakode T. Prolonged mask wearing and its adverse effects among dentists during COVID-19. *J Dent Res Rev.* 2023;10:24. doi: 10.4103/jdrr.jdrr_48_22.
15. Farronato M, Boccari E, Del Rosso E, Lanteri V, Mulder R, Maspero C. A Scoping Review of Respirator Literature and a Survey among Dental Professionals. *Int J Environ Res Public Health.* 2020;17:5968. doi: 10.3390/ijerph17165968.
16. Manuballa S, Abdelmaseh M, Tasgaonkar N, Frias V, Hess M, Crow H, Andreana S, Gupta V, Wooten KE, Markiewicz MR, et al. Managing the Oral Health of Cancer Patients During the COVID-19 Pandemic: Perspective of a Dental Clinic in a Cancer Center. *J Clin Med.* 2020;9:3138. doi: 10.3390/jcm9103138.
17. Long RH, Ward TD, Pruett ME, Coleman JF, Plaisance MC. Modifications of emergency dental clinic protocols to combat COVID-19 transmission. *Spec Care Dentist.* 2020;40:219–226. doi: 10.1111/scd.12472.
18. Bansal K, Saji S, Mathur V, Rahul M, Tewari N. A Survey of Self-perceived Physical Discomforts and Health Behaviors Related to Personal Protective Equipment of Indian Dental Professionals during COVID-19 Pandemic. *Int J Clin Pediatr Dent.* 2021;14:784–789. doi: 10.5005/jp-journals-10005-2061.
19. Ahmadi H, Ebrahimi A, Ghorbani F. The impact of COVID-19 pandemic on dental practice in Iran: a questionnaire-based report. *BMC Oral Health.* 2020;20:354. doi: 10.1186/s12903-020-01341-x.
20. Consolo U, Bellini P, Bencivenni D, Iani C, Checchi V. Epidemiological Aspects and Psychological Reactions to COVID-19 of Dental Practitioners in the Northern Italy Districts of Modena and Reggio Emilia. *Int J Environ Res Public Health.* 2020;17:3459. doi: 10.3390/ijerph17103459.
21. Chowdhury MTH, Apu EH, Nath SK, Noor AE, Podder CP, Mahmud I, Kabir R. Exploring the knowledge, awareness and practices of COVID-19 among dentists in Bangladesh: A Cross-sectional Investigation. *J Oral Res.* 2021;10:1–12. doi: 10.17126/joralres.2021.035.
22. Chakraborty T, Subbiah GK, Damade Y. Psychological Distress during COVID-19 Lockdown among Dental Students and Practitioners in India: A Cross-Sectional Survey. *Eur J Dent.* 2020;14:S70–S78. doi: 10.1055/s-0040-1719211.
23. Greenberg N, Docherty M, Gnanapragasam S, Wessely S. Managing mental health challenges faced by healthcare workers during covid-19 pandemic. *BMJ.* 2020;368:m1211. doi: 10.1136/bmj.m1211.
24. Dong Z-Q, Ma J, Hao Y-N, Shen X-L, Liu F, Gao Y, Zhang L. The social psychological impact of the COVID-19 pandemic on medical staff in China: A cross-sectional study. *Eur Psychiatry.* 2020;63:e65. doi: 10.1192/j.eurpsy.2020.59.
25. Bellini M, Maltoni O, Gatto MR, Pelliccioni G, Checchi V, Checchi L. Dental phobia in dentistry patients. *Minerva Stomatol.* 2008;57:485–495. Cited in: : PMID: 19078890.
26. Bellini M, Marini I, Checchi V, Pelliccioni GA, Gatto MR. Self-assessed bruxism and phobic symptomatology.

Original Article

- Minerva Stomatol. 2011;60:93–103. Cited: in : PMID: 21270735.
27. Kandhro R, Naz Memon K, Parveen Rajpar S, Talpur N, Nissa Z, Khalid Q. Practice of Modified Safety Measures for Covid-19 Adopted by Dental Health Care Providers and Barriers Faced by Them: Practice of Modified Safety Measures for COVID-19. Pak J Health Sci. 2023;24–29. doi: 10.54393/pjhs.v4i04.649.
28. Bharat R, Jagnade R, Katare G, Daga S. A Study of anxiety and fear level in dental practitioners from coronavirus and need of clinical practice modification to combat Covid -19. Univ J Dent Sci. 2021;6:92–97. doi: 10.21276/ujds.2020.6.3.24.
29. Mahdee AF, Gul SS, Abdulkareem AA, Qasim SSB. Anxiety, Practice Modification, and Economic Impact Among Iraqi Dentists During the COVID-19 Outbreak. Front Med. 2020;7:595028. doi: 10.3389/fmed.2020.595028. Cited: in : PMID: 33425944.
30. Ahmed MA, Jouhar R, Ahmed N, Adnan S, Aftab M, Zafar MS, Khurshid Z. Fear and Practice Modifications among Dentists to Combat Novel Coronavirus Disease (COVID-19) Outbreak. Int J Environ Res Public Health. 2020;17:2821. doi: 10.3390/ijerph17082821. Cited: in : PMID: 32325888.
31. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. Int J Oral Sci. 2020;12:9. doi: 10.1038/s41368-020-0075-9. Cited: in : PMID: 32127517.
32. McAlonan GM, Lee AM, Cheung V, Cheung C, Tsang KW, Sham PC, Chua SE, Wong JG. Immediate and Sustained Psychological Impact of an Emerging Infectious Disease Outbreak on Health Care Workers. Can J Psychiatry. 2007;52:241–247. doi: 10.1177/070674370705200406.
33. Tam CWC, Pang EPF, Lam LCW, Chiu HFK. Severe acute respiratory syndrome (SARS) in Hong Kong in 2003: stress and psychological impact among frontline healthcare workers. Psychol Med. 2004;34:1197–1204. doi: 10.1017/S0033291704002247.
34. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, Wu J, Du H, Chen T, Li R, et al. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. JAMA Netw Open. 2020;3:e203976. doi: 10.1001/jamanetworkopen.2020.3976. Cited: in : PMID: 32202646.
35. Van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, Tamin A, Harcourt JL, Thornburg NJ, Gerber SI, et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. N Engl J Med. 2020;382:1564–1567. doi: 10.1056/NEJMc2004973. Cited: in : PMID: 32182409.