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Occupational health characteristics of dentists: a descriptive study

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ABSTRACT

Aims: Dentists are exposed to a range of occupational hazards, including chemical and biological agents, ergonomic and psychosocial stress. There is limited data on how frequently they encounter these risks or how well they are protected.

Methods: This descriptive study gathered data through an online questionnaire. It explored demographic characteristics, occupational exposures, overall health, and the availability and use of occupational health and safety (OHS) measures.

Results: Of the 123 dentists, 44.7% reported having contracted COVID-19, and 35% experienced at least one occupational accident in the past year—two-thirds of which involved sharps injuries. Only 41.7% of these incidents were officially reported. Musculoskeletal problems were widespread, 66.7% of participants attributing them to their work. 54.5% had undergone pre-employment exams, 72.4% had periodic checkups, and 87.8% received OHS training. However, 74.8% noted a lack of local exhaust ventilation, and 68.3% said there was no general ventilation system. Dentists working night shifts or assigned to COVID-19 duties reported higher levels of stress and emotional strain.

Conclusion: While PPE use was generally adequate, there were serious shortcomings in ventilation, accident reporting, and ergonomic conditions. Improved training, workplace modifications, and better reporting systems is essential to ensure the health and safety of dental professionals.

Keywords: Dentists, occupational health and safety, sharp injuries, occupational diseases, COVID-19

INTRODUCTION

Oral and dental health personnel face many health and safety risks in their working lives. Compared to general health services, it has characteristics such as close contact with the patient, patient's respiratory area, and more frequent work with fast-rotating motorized and cutting tools.[1] These characteristics lead to more aerosol exposure, blood, and body fluid splashes.[2-5] While these usually occur in the form of occupational accidents, they can also occur as occupational infectious diseases after infection transmission.[6,7] It has been reported that 72% of dentists in Europe have experienced at least 1 sharps injury during their working life.[8] One study suggests that reporting of sharps injuries is 10 times lower than it should be.[9]

Dentists were in the high-risk group for COVID-19 infection due to the high formation of bioaerosols during intraoral interventions. However, due to the postponement of dental procedures and increased biosecurity measures, the numerical increase in the incidence of COVID-19 infection in dentists was less than expected.[10,11]

Musculoskeletal disorders due to ergonomic risk factors are also an important problem in oral dental health services.[12,13] Long working hours, prolonged standing, abnormal hand and wrist joints as well as abnormal posture involving the whole body are among the factors that cause musculoskeletal disorders.[14]

Stress, anxiety, and burnout are important psychological problems for dentists.[15] Studies have shown a high prevalence of work-related mental disorders.[16] Cumulative stress is known to reduce overall productivity.[17] Long working hours have been shown to negatively affect the general health and well-being of dentists.[18]

Recognizing and anticipating the existence of all these risks is essential for their prevention. Studies that will determine how

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and how often dentists are exposed to these risks will provide guidance to first identify the existing problems and then to make the necessary interventions to prevent them.

Therefore, it is aimed to determine the current situation of dentists working in Ankara province in terms of occupational health and safety (OHS) through a survey study. We investigated the associations between OHS services status and outcomes such as injuries and illnesses. We also investigated the organizational workloads and how dentists feel about them.

With the results of this study, it will be possible to identify priority areas and to make the necessary improvements. Again, scientific research, including intervention research, will be conducted in the light of the data to be obtained from the results of this study. In the long term, it is aimed to improve the working conditions of dentists and to ensure that they have a healthier and more productive working life.

METHODS

This study has been approved by the Hacettepe University Ethics Committee (Date: 14.06.2022, Decision No: E-35853172), and all procedures were conducted in accordance with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards

This is a descriptive study and conducted between April- May 2022. The population of the study is the dentists who are working at 12 health institutions under the Ankara Provincial Health Directorate and a sample was not selected as it was aimed to reach all dentists working in these institutions. Although the total number of dentists may vary due to reasons such as leave, transfer, temporary or permanent assignment, it was reported to be around 500 dentists in these institutions.

Data were collected using an online survey (Google Survey). Survey links were sent to the chief physicians of the relevant institutions, and they were forwarded to the physicians through communication clusters and asked for the participation of volunteers.

Data analysis was performed with SPSS 23.0 package program.

RESULTS

A total of 123 participants, 96 female and 27 male dentists, participated in our study. The mean age of the participants was 41.5 years (27-67). 100 participants were married and 19 were single. All participants were dental school graduates, 21 (17.1%) had a master's degree, 18 (14.6%) had a doctorate degree, and 16 (13%) had a specialty degree in dentistry.

While 73 (59.3%) of the participants stated that they never smoked cigarettes, 27 (22%) stated that they smoked regularly and 23 (18.7%) stated that they had quit smoking. While 68 (55.3%) of the participants had never used alcohol, 53 (43.1%) used alcohol occasionally and 2 people stated that they used alcohol frequently. 32 (26%) of the participants stated that they had chronic diseases. The mean body mass index value of male dentists was 26.1±2.1 and 23.7±3.4 for female dentists.

Participants were asked whether they had been diagnosed with PCR positive COVID-19 disease to find out whether they had COVID-19 disease. 55 people (44.7%) stated that they were diagnosed with PCR positive COVID-19 disease.

After general demographic and health information, participants were asked about their vaccination status. When asked about hepatitis B vaccination status, 112 participants (91.1%) stated that they had HBV vaccines with all doses completed. The frequency of tetanus vaccination was 72.4% (89 people). When asked about influenza vaccination status in the last 1 year, it was learned that 30 people (24.4%) had been vaccinated. COVID-19 vaccination status was also asked. It was learned that 119 people (96.7%) had COVID vaccination and 4 people did not. Some characteristics of the general health status of the dentists participating in the study are summarized in Table 1.

Table 1. Some characteristics of the dentists participating in the study regarding their general health status

		n	Percent
Smoking	Never	73	59.3
	Still smoking	27	22
	Quit smoking	23	18.7
Chronic disease	Present	32	26
	Absent	91	74
COVID-19 disease	Yes	55	44.7
	No	68	55.3
Vaccination (full dose)	HBV	112	91.1
	Tetanose	89	72.4
	Influenza	30	24.4
	COVID-19	119	96.7

Participants were asked questions about their working life. Physicians had worked for a median total of 17 years (1-38) and had been working in their last institution for 4 years (1-28). It was found that they worked a median of 40 hours per week (7-68) and saw a median of 25 patients per day (0-70) and, 71.5% of the physicians worked night shifts. 93 dentists (75.6%) stated that they had a task related to COVID-19 during the pandemic. Some information about the working lives of the dentists participating in the study is summarized in Table 2.

Table 2. Some information about the working life of the dentists participating in the study

		n	Median (min-max)
Total working time in the profession	(Years)	123	17 (1-38)
Time spent in the last unit	(Years)	123	4 (1-28)
Weekly working time	(Hours)	123	40 (7-68)
Number of patients per day		123	25 (0-70)
		n	Percent
Night shift?	Yes	88	71.5
	No	35	28.5
Working in COVID-19 duties?	Yes	93	75.6
	No	30	24.4

Min: Minimum, Max: Maximum

When asked about occupational health risks, 94.3% of dentists stated that they were not exposed to radiation. There were 110 (89.4%) who stated that they were exposed to cleaning chemicals and disinfectants, 83 (67.5%) who were exposed to dust and other chemicals, 114 (92.7%) who were exposed to patient blood and other body fluids, and 110 (89.4%) who were exposed to patient breathing air. Among the ergonomic risk factors, 85.4% of the physicians stated that they were exposed to prolonged standing, while 94.3% of the physicians stated that they performed procedures requiring abnormal posture such as reaching, bending, and standing still.

In the questions about the status of dentists regarding OHS services, 67 (54.5%) of the participants stated that they were examined at the beginning of their employment, 89 (72.4%) stated that they were periodically examined, and 108 (87.8%) stated that they received OHS training. When the measures for controlling occupational health risks were questioned, 74.8% (92 people) of the dentists stated that there was no local exhaust ventilation system against dust and biological agents, and 68.3% stated that there was no general ventilation system. In addition, 98 (79.7%) stated that personal protective equipment was available and used regularly, while 16 (13%) stated that personal protective equipment was not sufficient. When asked about protection from radiation exposure, 60 (48.8%) of the participants stated that they do not perform X-rays. Sixty-one of the 63 dentists who performed X-rays stated that there was a lead-blocked room and that they performed all X-rays in that area.

When asked about the frequency of occupational accidents and occupational diseases, 65% of the dentists (80 people) stated that they did not experience an occupational accident in the last 1 year. Since one person can have more than one accident, a total of 56 accidents occurred. Of these accidents, 37 (66%) were reported as penetrating sharps injuries, 18 (32.1%) as biological material splashes and 1 gas poisoning. When asked whether a notification was made after an occupational accident, 28 (58.3%) of the 48 people who had an accident answered no. Of the 123 participants, 92 (74.8%) stated that they were not diagnosed with an occupational disease, 19 (15.4%) stated that they were referred with suspicion of occupational disease, and 12 (9.8%) stated that they were diagnosed with an occupational disease. The declared diagnoses were: Latex allergy, lumbar disc herniation, cervical disc herniation, right hand Kienböck's precursor, varicose veins, epicondylitis, neck flattening, tennis elbow, onset of lumbar disc herniation, heel spur, tendonitis, covid 19, arthritis, spinal curvature, kyphosis, carpal tunnel syndrome. When asked "do you think you have an occupational disease?" 82 people (66.7%) answered yes. When they were asked open-endedly what these diseases were; although more than one disease was declared, almost all the participants stated that they thought that back, neck and joint pain were occupational.

No difference was observed between the frequency of occupational accidents and receiving periodic examinations, while the frequency of occupational accidents in those who stated that they did not receive OHS training was found to be significantly higher than those who received training (p=0.042) (Table 3). No relationship was observed between the frequency of notification after an occupational accident and receiving a fitness for work examination, periodic examination or OHS training.

Table 3. The relationship between OHS services and occupational injuries

		Occupational injury		
		No n (%)	Yes n (%)	p
OHS training	No	6 (40)	9 (60)	0.042*
	Yes	74 (68.5)	34 (31.5)	
Periodic examination	No	20 (58.8)	14 (41.2)	0.403
	Yes	60 (67.4)	29 (32.6)	
Fitness for work assessment	No	34 (60.7)	22 (39.3)	0.448
	Yes	46 (68.7)	21 (31.3)	

OHS: Occupational health and safety, p<0.05 significant

The correlation between some variables in the working life of dentists and their answers about the worry of not being able to finish the work, the thought of not being useful, feeling unhappy and feeling inadequate were analyzed by Spearman correlation test. As the number of patients seen per day increased, there was an increase in the feeling of not being useful (r=0.213, p=0.018) and feeling unhappy (r=0.290, p=0.001). There was no correlation between the total years of service in the profession and the duration of service in the last unit of employment and the anxiety of not being able to complete the work, feeling unhappy and feeling inadequate.

The status of working night shifts and working in pandemic-related tasks during the pandemic compared with the status of worrying about not being able to finish work, feeling unhappy, feeling inadequate and feeling inadequate. It was found that those who worked night shifts had higher unhappy feeling scores (p=0.005). The unhappy feeling scores and thoughts of not being useful were found to be significantly higher in those who took tasks related to the COVID-19 pandemic (p=0.045 and p=0.041 -Fisher's Exact test-, respectively).

DISCUSSION

In our study, data on general demographic information, health status, OHS services, occupational accidents and occupational diseases, OHS risks and precautions taken, and psychosocial status of dentists in working life were obtained.

In our study, 35% of the physicians who responded to our survey had occupational accidents. Of these accidents, 66% were identified as penetrating sharps injuries. In a study conducted in the United States of America, it was determined that 20% of percutaneous penetrating sharps injuries reported by healthcare workers were reported by oral and dental health personnel. It was observed that 66.7% of these notifications were made by dentists.[19] In another study, nurses accounted for more than half of the cases, and the majority of affected workers were female.[20] Shimoji et al.[1] found that 50-60% of oral and dental health personnel sustained penetrating sharps injuries and 88% were exposed to blood and body fluid splashes.

In a study conducted in the UK, it was estimated that penetrating sharps injuries were detected approximately 10 times less than the actual situation.[9] In Shimoji's study,[1] 30.3% of those who sustained a penetrating sharps injury

reported it. When evaluated accident-specifically, it was found that 10.3% of dentists reported penetrating sharps injuries and 15.5% of splash injuries. In our study, the rate of reporting after occupational accidents was 41.7%. However, no occupational accident was reported in case of biological material splashing.

In our study, 74.8% of dentists stated that there was no local exhaust ventilation system against dust and biological agents, and 68.3% stated that there was no general ventilation system. In a study conducted in Nigeria, 72.2% of the participants stated that ambient ventilation was adequate.[6] In our study, 79.7% of the participants stated that personal protective equipment was available and used regularly. In Shimoji's study,[1] compliance with PPE use was reported as 60.3%.

In a study conducted in dentists, 47% of the dentists surveyed stated that they had work-related musculoskeletal disorders. It was found that dentists who reported having these disorders were older, had longer working hours and worked longer.[13] A systematic review found that the prevalence of musculoskeletal pain in dentists ranged from 64 to 93%.[21] In a study from Australia, 87% of dentists surveyed reported experiencing at least one work-related musculoskeletal symptom in the past year.[22] In a study conducted in Nigeria, musculoskeletal disorders were found to be the most frequently reported occupational health problem among oral and dental health personnel.[6] In a study conducted in oral dental health workers in Turkiye, musculoskeletal disorders were reported as the most frequently reported work-related health problem.[23] In a systematic review, the annual prevalence of musculoskeletal disorders affecting at least one body region was reported to range between 68% and 100%.[24] In our study, like the literature, musculoskeletal disorders were the most frequently complained health problem by dentists. 66.7% of the participants stated that they had these musculoskeletal disorders as occupational diseases.

Studies in Latin America have shown that the COVID-19 pandemic process and its restrictions had negative effects on dentists' perceived stress and subjective well-being.[25,26] A study conducted in Italy also showed that dentists experienced feelings of worry, anxiety, and fear during the COVID-19 pandemic.[27] In a review in 2025, work-related stress was reported to be widespread and to be associated with mental health outcomes such as burnout syndrome, emotional exhaustion, and suicidal ideation, among dental personnel.[28] In our study, unhappy feeling scores and thoughts of not being useful were found to be significantly higher in those who worked in relation to the COVID-19 pandemic.

Limitations

The main limitation of the research is the low response rate since the questionnaires were not applied face-to-face. For this reason, it only reflects the views of those who responded to the research and is not generalizable to any group.

CONCLUSION

The results of the study showed that dentists in Ankara province were in good condition in terms of OHS services. Although the presence and use of personal protective equipment was appropriate in terms of OHS risks, it was thought that there were deficiencies in local and general exhaust ventilation systems. In addition, the presence of ergonomic risk factors such as abnormal posture and prolonged standing, which may cause musculoskeletal system disorders, drew attention. It was observed that radiation exposure was low, and protective measures were observed in cases where there was radiation exposure. A low level of awareness in terms of occupational accident notifications was observed.

In the light of all these findings, training in ergonomics and corrective actions in the work environment are required. Fitness for work assessments of employees with musculoskeletal disorders should be conducted again to identify and eliminate situations that will cause the progression of their diseases. It is recommended that technical corrections be made to ventilation systems to reduce exposure to biological and inorganic dust and aerosols in the work environment.

It would be appropriate to eliminate the deficiencies in the legally mandatory periodic examinations, recruitment examinations and OHS trainings. In addition, it is recommended that training and administrative measures be used to overcome the deficiencies in the legally mandatory reporting of occupational accidents.

ETHICAL DECLARATIONS

Ethics Committee Approval

This study has been approved by the Hacettepe University Ethics Committee (Date: 14.06.2022, Decision No: E-35853172).

Informed Consent

Written informed consent was obtained from all individual participants prior to their inclusion in the study. Participants were fully informed about the study's aims, procedures, potential risks and benefits, and their rights—including the right to withdraw at any time without consequence. All participants voluntarily signed a written informed consent form.

Peer Review Process

This manuscript was subject to external peer review.

Conflict of Interest

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

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Author Contributions

Concept: M.E.A., M.C.A.; Design: M.E.A., M.S.; Control: M.E.A., M.S., B.Ç.; Resources: M.E.A., M.C.A., Z.D.; Materials: M.E.A., M.C.A., Z.D.; Data Collection and/or Processing: M.E.A., M.S., M.C.A.; Analysis and/or Interpretation: M.E.A., M.S., B.Ç.; Literature Review: M.E.A., M.C.A.; Writing the Article: M.E.A., M.S., M.C.A.; Critical Review: M.E.A., M.S., B.Ç.

REFERENCES

1. Shimoji S, Ishihama K, Yamada H, et al. Occupational safety among dental health-care workers. *Adv Med Educ Pract*. 2010;1:41-47. doi:10.2147/AMEP.S13130
2. Ishihama K, Iida S, Koizumi H, et al. High incidence of blood exposure due to imperceptible contaminated splatters during oral surgery. *J Oral Maxillofac Surg*. 2008;66(4):704-710. doi:10.1016/j.joms.2007.06.663
3. Harrel SK, Molinari J. Aerosols and splatter in dentistry: a brief review of the literature and infection control implications. *J Am Dent Assoc*. 2004;135(4):429-437. doi:10.14219/jada.archive.2004.0207
4. Yamada H, Ishihama K, Yasuda K, Hasumi-Nakayama Y, Shimoji S, Furusawa K. Aerial dispersal of blood-contaminated aerosols during dental procedures. *Quintessence Int*. 2011;42(5):399-405.
5. Ishihama K, Koizumi H, Wada T, et al. Evidence of aerosolised floating blood mist during oral surgery. *J Hosp Infect*. 2009;71(4):359-364. doi:10.1016/j.jhin.2008.12.005
6. Osazuwa-Peters N, Azodo CC, Obuekwe ON. Occupational health issues of oral health care workers in Edo State, Nigeria. *Int Dent J*. 2012;62(3):117-121. doi:10.1111/j.1875-595X.2011.00101.x
7. Kohn WG, Collins AS, Cleveland JL, et al. Guidelines for infection control in dental health-care settings--2003. *MMWR Recomm Rep*. 2003;52(RR-17):1-61.
8. Bouya S, Balouchi A, Rafiemanesh H, et al. Global prevalence and device related causes of needle stick injuries among health care workers: a systematic review and meta-analysis. *Ann Glob Health*. 2020;86(1):35. doi:10.5334/aogh.2698
9. Elder A, Paterson C. Sharps injuries in UK health care: a review of injury rates, viral transmission and potential efficacy of safety devices. *Occup Med (Lond)*. 2006;56(8):566-574. doi:10.1093/occmed/kql122
10. Evaristo-Chiyong T, Mattos-Vela MA, Agudelo-Suarez AA, et al. General labor well-being in Latin American dentists during the COVID-19 pandemic. *Int J Environ Res Public Health*. 2022;19(10):6317. doi:10.3390/ijerph19106317
11. Araujo MWB, Estrich CG, Mikkelsen M, et al. COVID-2019 among dentists in the United States: a 6-month longitudinal report of accumulative prevalence and incidence. *J Am Dent Assoc*. 2021;152(6):425-433. doi:10.1016/j.adaj.2021.03.021
12. Wu J, McCullough M, Panisset MG, Galea MP. Prevention of work-related musculoskeletal disorders among dental professionals: a scoping review. *Work*. 2022;72(1):91-108. doi:10.3233/WOR-205257
13. Alnaser MZ, Almaqsied AM, Alshatti SA. Risk factors for work-related musculoskeletal disorders of dentists in Kuwait and the impact on health and economic status. *Work*. 2021;68(1):213-221. doi:10.3233/WOR-203369
14. Aljanakh M, Shaikh S, Siddiqui AA, Al-Mansour M, Hassan SS. Prevalence of musculoskeletal disorders among dentists in the Hail Region of Saudi Arabia. *Ann Saudi Med*. 2015;35(6):456-461. doi:10.5144/0256-4947.2015.456
15. Mandel ID. Occupational risks in dentistry: comforts and concerns. *J Am Dent Assoc*. 1993;124(10):40-49. doi:10.14219/jada.archive.1993.0215
16. Puriene A, Janulyte V, Musteikyte M, Bendinskaite R. General health of dentists. Literature review. *Stomatologija*. 2007;9(1):10-20.
17. Yee T, Crawford L, Harber P. Work environment of dental hygienists. *J Occup Environ Med*. 2005;47(6):633-639. doi:10.1097/01.jom.0000165745.89527.7e
18. Puriene A, Aleksejuniene J, Petrauskiene J, Balciuniene I, Janulyte V. Occupational hazards of dental profession to psychological wellbeing. *Stomatologija*. 2007;9(3):72-78.
19. Shah SM, Merchant AT, Dosman JA. Percutaneous injuries among dental professionals in Washington State. *BMC Public Health*. 2006;6:269. doi:10.1186/1471-2458-6-269
20. Zhang M, Chen Y, Zhang S, Fan X. Sharps injuries in a dental specialty hospital: retrospective analysis of occupational risks, 2020-2024. *BMC Oral Health*. 2025;25(1):1618. doi:10.1186/s12903-025-07020-z
21. Hayes M, Cockrell D, Smith DR. A systematic review of musculoskeletal disorders among dental professionals. *Int J Dent Hyg*. 2009;7(3):159-165. doi:10.1111/j.1601-5037.2009.00395.x
22. Leggat PA, Smith DR. Musculoskeletal disorders self-reported by dentists in Queensland, Australia. *Aust Dent J*. 2006;51(4):324-327. doi:10.1111/j.1834-7819.2006.tb00451.x
23. Ocek Z, Soyer MT, Aksan AD, Hassoy H, Manavgat SS. Risk perception of occupational hazards among dental health care workers in a dental hospital in Turkey. *Int Dent J*. 2008;58(4):199-207. doi:10.1111/j.1875-595x.2008.tb00349.x
24. Soo SY, Ang WS, Chong CH, Tew IM, Yahya NA. Occupational ergonomics and related musculoskeletal disorders among dentists: a systematic review. *Work*. 2023;74(2):469-476. doi:10.3233/WOR-211094
25. Leon-Manco RA, Agudelo-Suarez AA, Armas-Vega A, et al. Perceived stress in dentists and dental students of Latin America and the Caribbean during the mandatory social isolation measures for the COVID-19 pandemic: a cross-sectional study. *Int J Environ Res Public Health*. 2021;18(11):5889. doi:10.3390/ijerph18115889
26. Garces-Elias MC, Leon-Manco RA, Armas-Vega A, Viteri-Garcia A, Agudelo-Suarez AA. Impact of mandatory social isolation measures due to the COVID-19 pandemic on the subjective well-being of Latin American and Caribbean dentists. *J Clin Exp Dent*. 2022;14(1):e40-e47. doi:10.4317/jced.58776
27. 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(10):3459. doi:10.3390/ijerph17103459
28. Căminişteanu F, Vorovenci A, Perieanu VŞ, et al. Occupational diseases among dental personnel: a scoping review. *J Med Life*. 2025;18(6):526-535. doi:10.25122/jml-2024-0412