Volume 3, Issue 1, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

ASSESSMENT OF OCCUPATIONAL HAZARDS AMONG DENTAL PROFESSIONALS

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DOI: https://doi.org/10.5281/zenodo.15305695

Keywords
Occupational hazards, Dental professionals, Clinical practice

Article History
Received on 19 January 2025
Accepted on 25 March 2025
Published on 31 March 2025

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Abstract

Occupational hazards refers to a risk or danger experienced in the work place. Dentistry is considered to be a profession with a demanding nature. There are risks which pose a serious threat to the dental professionals. The aim of this study was to determine the prevalence of occupational hazards among dental professionals in KPK.

This study was a descriptive cross-sectional study carried out at Sardar Begum Dental college and Hospital Peshawar, Saidu group of Teaching Hospital Swat, Bacha Khan Dental college and Hospital Mardan and District Head Quarter Hospital Mardan. The research spanned six months and involved 384 participants. Data was collected using a structured questionnaire, after obtaining written informed consent from participants who satisfied the inclusion criteria.

In the study, out of 384 dental professionals 76% were dentists, 10.4% technologists and 13.5% were technicians. Among them 51% were female participants and 49% were male participants. Biological hazards, such as saliva (as a source of cross-transmission of diseases), were the most prevalent i.e. 83.3% among occupational hazards followed by psychological hazards i.e. extended working hours 75.8%. 72.7% of the participants use proper PPEs. Majority of the participants (61.7%) were unaware of the term technostress.

It was concluded from the study that awareness regarding these occupational hazards and implementation of preventive strategies can provide a safe working environment for all the dental personnel. There is also a need for continuing dental education programs in dentistry so that dentists can update themselves with the latest and newer techniques and materials.

INTRODUCTION

An occupational hazard is a risk or danger that arises from the nature of a particular job or its working environment (1). It may also be used to describe a task, item, material, procedure, or circumstance that either causes or contributes to workplace accidents or illnesses (2). The emergence of occupational medicine or health as a distinct field occurred in 18th century when Bernadino Ramazzini, published his book "Morbis Artificum Diatriba" Diseases of worker(3).

Dentists, along with other dental personnel's are persistently prone to a variety of particular occupational hazards. Despite recent technological advancements, a number of occupational health issues still exist in

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ISSN: (e) 3007-1607 (p) 3007-1593

contemporary dentistry (4). The goal of occupational health is to safeguard and advance an employee's health through a holistic and collaborative approach (5).

The sources of occupational hazards include physical, biological, chemical and psychological aspects (6). Eye pain, radiation exposure, percutaneous exposure incidents (PEI) and inadequate light in the work place are common physical hazards in dentistry. Numerous biological cells can sustain damage from harmful radiation, including ionizing radiation (X-rays) and non-ionizing radiation (visible and UV light) (7). Inadequate lighting causes eye strain, eye pain, headache and eye exhaustion where as high level of brightness can cause discomfort and eye tiredness (8).

Biological hazards include bacteria, virus, and funji that can cause infections. As dentist work in a limited access area and are repeatedly in contact with piercing instruments, sharp injuries incidents enhance infectious disease transmission such as human immunodeficiency virus (HIV), hepatitis C virus (HCV) and hepatitis B virus (HBV) (9).

Mercury, nitrous oxide, disinfectants (glutaraldehyde) and powdered natural rubber latex are among the chemical hazards. Mercury-containing dental amalgam is considered potentially hazardous dental material due to its toxicity (10). High pressure work environment, depression, anxiety and patients conflicts are some of psychological hazards (11). Stress is the most common psychological condition among dentists. According to a number of studies, dentists feel that their jobs are more stressful than those in other professions (12).

Dentists should monitor their mental health, manage their working hours and be mindful of potential workplace risks. Developing and implementing strategies to improve mental health and lessen the consequences of occupational hazards is necessary to ensure the well-being of dentists (13). Dental professionals should be aware of individual protective measures like personal protective equipment (PPE) and appropriate sterilization and other high level disinfection utilities to control infection (14). Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental, and social well being of workers in all occupations (15).

The aim of this study was to investigate the types and prevalence of occupational hazards and the measures taken by dental professionals to mitigate them.

MATERIALS AND METHODS

This research utilizes a descriptive cross-sectional study design, employing non-probability convenience sampling techniques. The study was conducted at multiple healthcare institutions, including Sardar Begum Dental College and Hospital in Peshawar, Saidu Group of Teaching Hospitals in Swat, Bacha Khan Dental College and Hospital in Mardan, and District Headquarter Hospital in Mardan. A total of approximately 384 participants were included in the study, comprising 196 females and 188 males. The participants consisted of dentists and dental assistants (technicians/technologists) actively working in clinical settings. However, individuals with pre-existing medical conditions, such as musculoskeletal disorders or allergies, were excluded from participation.

Initially, an Ethical approval letter for the study was obtained from the Institutional Ethical Review Committee. Following this, permission to conduct the study, along with a thorough discussion of all ethical considerations related to the research, was secured from the heads of the respective hospital departments. Written informed consent was obtained from each participant prior to data collection. The required information was gathered using a structured questionnaire. The collected data were then analyzed using SPSS version 25.0, and the results were presented through tables and bar graphs.

RESULT

A total of 384 individuals were included in this descriptive cross-sectional study. Among the participants, slightly more than half were female, totaling 196 (51%), while the remaining 188 (49%) were male. The majority of the respondents (79.7%, n=306) belonged to the 21–

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ISSN: (e) 3007-1607 (p) 3007-1593

30-year age group. Additionally, 66 participants (17.2%) were between 31–40 years of age, 8 participants (2.1%) were within the 41–50-year range, and only 4 participants (1%) fell into the 51–60-year age group. In terms of professional roles, the majority (76%, n=292) identified as dentists, followed by dental technicians (13.5%, n=52) and dental technologists (10.4%, n=40), as detailed in Table-1.

Table-1: Demographic Characteristics

S. No.	Variables		Frequencies	Percentage(s)
1	Age group	21-30	306	79.7
		31-40	66	17.2
		41-50	8	2.1
		51-60	4	1.0
2	Gender	Male	188	49.0
		Female	196	51.0
3	Professional Specialty	Dentists	292	76.0
		Technologists	40	10.4
		Technicians	52	13.5

The demographic profile of the participants revealed that the majority had relatively limited working experience. Specifically, 307 participants (79.9%) reported having 1–5 years of work experience, making them the most represented group in the sample. A smaller proportion, 53 participants (13.8%), had 6–10 years of experience, while 17 participants (4.4%) reported 11–15 years of experience. Only 7 participants (1.8%) had been working for more than 15 years. This distribution indicates that the sample primarily consisted of early-career professionals. Regarding knowledge of technostress, 147 participants (38.3%) indicated that they were aware of the concept, whereas a larger portion, 237 participants (61.7%), reported that they had no knowledge of technostress. These findings suggest a considerable knowledge gap among the participants, highlighting the need for increased awareness and education on the subject (Table-2).

Table-2: Responses of the Participants

S. No.	Responses		Frequencies	Percentage(s)
1	Working experience	1-5 years	307	79.9
		6-10 years	53	13.8
		11-15 years	17	4.4
		>15 years	7	1.8
2	Knowledge regarding technostress	Yes	147	38.3
		No	237	61.7

Physical hazards

The prevalence of musculoskeletal disorders—classified as physical hazards—among dental professionals was assessed, revealing concerning levels of back pain and muscular strain. A total of 26% (n = 100) of participants reported experiencing back pain on a daily basis, while 24.2% reported experiencing it weekly. In contrast, only 23.7% stated that they experienced back pain rarely. Regarding muscular strain, 25% of participants indicated that they experienced it consistently ("always"), while 13.8% reported never experiencing it. Notably, the majority of respondents (61.2%) reported experiencing muscular strain occasionally ("sometimes"). These findings, summarized in Table-3, underscore the high prevalence of physical discomfort within the dental profession and highlight the pressing need for ergonomic awareness and interventions to mitigate the impact of such occupational health risks.

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ISSN: (e) 3007-1607 (p) 3007-1593

Table-3: Frequencies of physical hazards

S. No.	Physical Hazards		Frequencies	Percentage(s)
1	Back pain	Daily	100	26.0
		Weekly	93	24.2
		Monthly	100	26.0
		Rare	91	23.7
2	Muscular strain	Always	96	25.0
		Never	53	13.8
		Sometimes	235	61.2

Frequency of chemical hazards

A majority of participants (71.4%, n = 274) believed that contact with mercury could have adverse consequences. The use of personal protective equipment (PPE) was also assessed, with 72.7% (n = 279) of participants reporting regular use of PPEs. This indicates that a substantial proportion of dental professionals recognize the importance of PPEs in preventing chemical hazards (Table-4).

In terms of allergies, latex was the most commonly reported allergen, affecting 22.1% (n = 85) of participants, followed closely by monomer (21.1%, n = 81) and medications/drugs (22.1%, n = 85). Notably, 34.6% (n = 133) of participants reported having no allergies.

Table-4: Frequencies of chemical hazards

S. No.	Chemical Hazards		Frequencies	Percentage(s)
1	Mercury effects	Yes	274	71.4
		No	110	28.6
2	PPEs	Yes	279	72.7
		No	105	27.3
3	Allergy	Latex	85	22.1
		Monomer	81	21.1
		Medicine/Drugs	85	22.1
		None	133	34.6

Biological hazards

Furthermore, 83.3% (n = 320) of participants identified saliva as a potential source of disease transmission. Additionally, 57.6% (n = 221) reported experiencing a needle puncture injury during the course of their work (Table-5).

Table-5: Frequencies of biological hazards

S. No.	Biological hazards		Frequencies	Percentage(s)
1	Saliva	Yes	320	83.3
		No	64	16.7
2	Needle stick injury	Yes	221	57.6
		No	163	42.4

Psychological hazards:

A substantial proportion 52.3% (n=201) of participants agreed to suffer from nervousness and anxiety after work. 75.8%, (n=291) of participants agreed that extended working hours affect the mental wellbeing of dental professionals (Table-6).

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ISSN: (e) 3007-1607 (p) 3007-1593

Table-6: Frequencies of psychological hazards

S. No.	Psychological hazards		Frequencies	Percentage(s)
1	Nervousness and anxiety	Yes	201	52.3
		No	183	47.7
2	Extended working hours	Yes	291	75.8
		No	93	24.2

DISCUSSION

One of the most important elements of a successful dental office is a healthy dentist. Dental professionals are continuously exposed to a variety of particular occupational dangers. Modern dentistry still faces a number of occupational health issues in spite of recent technological advancements. These risks originate from the workplace, which may involve physical, chemical, biological, and psychological elements. Several investigations are performed in the past to find prevalence of occupational hazards (16).

In this present study the age distribution of the participating staff ranged from 20 to 60 years. In this study, only 38.3% of dental professionals were aware of the term technostress. Technology alters how people work, and as a result of its quick development, change is unavoidable and can be stressful. Ramaswami et.al (2020), in their study among dentist in Saudi Arabia documented that 26% of the dentist experienced technostress (3).

In the current research, we observed that 26% of the participants experienced back pain on daily basis, 24.2% on weekly basis, and 26.0% on monthly basis while 23.7% experienced back pain rarely. In their study of Australian dentists, Leggat and Smith found that 54% of them experience lower back pain. A research conducted in Denmark showed that 60.4% of dentists reported having back pain, and the majority used a sitting technique. A study conducted in Nigeria by Fasunloro A and Owotade FJ revealed that back discomfort was prevalent among dental professionals (17). The repetitive motions and fixed position during patient care may be the reason of the occupationally acquired backache (8).

According to the present study 25% of the participants always experienced pain in their muscles, 13.8% experienced no muscular strain while majority of the participants (61.2%) experienced muscular strain sometimes. Regarding musculoskeletal problems, 66.4% of people had different kinds of aches, such as back, wrist, and knee pain. This is consistent with a research conducted in Greece that found that 66% of dentists have these issues. Similar results are also reported by other research conducted in Australia, Israel, and Denmark. Thus, with a reported incidence of 32–82%, musculoskeletal issues are the most common among dentists globally (4). Limited physical activity in the dental profession contributes to a higher incidence of MSD among dentists (18).

Dentistry is considered one of the more stressful medical speciality due to specific variables such as physical strain, patients discomfort and anxiety, lack of appreciation, and extended working hours. In the present study, 52.3% of the participant agreed that they experienced nervousness and anxiety after work. Our results illustrate a low prevalence of the mental disorders compared with that reported by other researchers (19). In Lituania 95.7% of the dentists suffered psychological problems. Professional's mental health is also impacted by long work hours. 75.8% respondents to the current study stated that a dental professional's mental health is impacted by their extended work hours. Dentists must identify stressors, implement suitable stress management techniques, and adopt healthy behaviours and attitudes in order to lessen those negative consequences (20).

CONCLUSION

According to our study findings it was revealed that the dental profession still faces various occupational health hazards, highlighting the need for further progress beyond existing advancements. Being healthy is essential for professional productivity. Stressful working conditions combined with high production expectations will have an impact on general

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ISSN: (e) 3007-1607 (p) 3007-1593

health. It is important to remember that all technologies, regardless of their advantages, have the potential to negatively affect certain segments of society. Dentists should be mindful of workplace dangers, manage their working hours and speed, and keep an eye on their mental well-being.

RECOMMENDATION

To ensure the wellbeing of dentists, initiatives for enhancing psychological well-being and lessening the consequences of workplace dangers should be created and put into practice. There should be a lot of oral health education initiatives so that dentists can learn about the most recent advancements and methods for creating a positive work atmosphere.

Funding: The publication charges for this article are borne from the Khyber Medical University publication fund. **(Reference No: DIR/ORIC/Ref/25/00110).**

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