



Physical & Postural Determinants of Musculoskeletal Disorders among Dental Healthcare Professionals

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Authors' contributions

This work was carried out in collaboration among all authors. Authors AH and PIM designed the study. Authors AAUR, MIS and SP validated the questionnaire. Authors AH and FJS conducted the study. Author AH wrote the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i1631294

Editor(s):

(1) Dr. Syed A. A. Rizvi, Nova Southeastern University, USA.

Reviewers:

(1) Sergio Valverde Marques dos Santos, Minas Gerais State University, Brazil.

(2) Pedro Augusto Croce Carlotto, Universidade Federal de Santa Catarina, Brazil.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/66238>

Original Research Article

Received 02 January 2021

Accepted 08 March 2021

Published 24 March 2021

ABSTRACT

Background: According to World Health Organization, work-related health deals with all facets of health and determinants of one's health may vary in different occupations. Identifying those determinants may be crucial for primary prevention of risks and adverse health conditions.

Objective: To identify the physical and postural determinants of musculoskeletal disorders among dental healthcare professionals.

Methodology: A cross-sectional descriptive study was carried out amongst public and private sector dentists of Hyderabad. The data was collected through pre-tested questionnaire from 132

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participants. Participants' socio-demographic characteristics, personal information, work-related factors, physical load related factors and prevalence of different musculoskeletal pain sites were analyzed through frequencies. Associations were assessed using Pearson's coefficient the strength of association was determined via Chi-square test.

Results: Females (39.4%) as compared to males (60.6%) were more affected and most subjects falling in the age group of 24-28 years with +0.66 SD. The postgraduate (77.3%) individuals were more affected as compared to their graduate counterparts. Furthermore, majority complained of neck pain (65.8%) followed by back (64%) & shoulder (59.6) pain. The study also found out that majority of the dentists (95.6%) have a reduction in activity due to MSDs. The only significant association (P value = 0.039) was found between sleeping hours/day and occurrence of MS disorders.

Conclusion: Musculoskeletal disorders amongst dentists were found in remarkably high number. Wrong posture and poor physical ergonomics of workspace are attributed to higher incidence of MSDs.

Keywords: Occupational health; musculoskeletal disorders; dentist; posture & determinant of health.

1. INTRODUCTION

According to World Health Organization, work-related health deals with all facets of health and safety in the place of work and has a sturdy focus on primary prevention of risks. Worker's health has several determinants, which includes risk factors at the workplace that could lead to various adverse health conditions, such as musculoskeletal disorders (MSD), respiratory & circulatory diseases, cancers, accidents, hearing loss, stress induced disorders etc [1,2].

Dentists experience a distinctive set of complications such as demanding procedures, time allied pressure, fearful patients, team problems and the monotonous nature of the skilled work. It is said that dental surgeons had lower comfort in comparison to selected general population due to the increased professional demands. The MSDs related studies on dentists are very less in number. A survey was conducted on 2000 U.S dentists suggested that 60% respondents experienced MS pain, in which highest incidence was of lower back pain and after that, it was of neck pain [3,4].

MSD comprise of a complete set of disorders of muscle, nerve, tendons, ligaments, joints, cartilage or spinal disc. They tend to aggravate with time and worsen due to repetitive work type [work related musculoskeletal disorders (WRMSDs)]. WRMSD's have a harmful impact on work ability which may result in early retirement. A dentist may have almost 50% chances for retirement due to ill health [5].

There are number of symptoms reported to be associated with musculoskeletal disorders including weakness, paresthesia and pain. It is

estimated that approximately more than 2 million are affected by the musculoskeletal disorders. The personnel involved in dentistry are also at high risk of developing these disorders [6]. MSDs develop due to overdoing work in fixed postures and in uncomfortable physical ergonomics. The damage thus never actually properly heals since re-injury occurs because of repeated exposure to same factors.

Work related musculoskeletal disorder is a major public health issue and the common MSD in dental healthcare professional include tenosynovitis, bursitis, synovitis, tendinitis and pronator teres syndrome, [7] while physical and postural determinants may be the repetitive continuous motion, vigorous exertions, uncomfortable body postures, and shaking. If an association between the aforementioned, or other conditions and determinants is identified, appropriate preventive steps may be taken [8]. The need is high since MSDs affect not only the general health of dental practitioners but also affect their quality of life.

2. METHODOLOGY

A cross-sectional descriptive study was carried out amongst public and private sector dentists of Hyderabad. The data was collected through pre-tested questionnaire from 132 participants. The questionnaire included the socio-demographic characteristics, personal information, work-related factors; physical load related factors and prevalence of different musculoskeletal pain sites were analyzed through frequencies by using SPSS 21. Associations were assessed using Pearson's coefficient the strength of association was determined via Chi-square test.

3. RESULTS

The sample comprised of a majority of males, with aging falling with the age bracket of 29-33 years and most practitioners had a post-graduate qualification.

The physical load was rather intense, with many complaining of the physical work environments to be unsuitable.

Females (39.4%) as compared to males (60.6%) were more affected and most subjects falling in the age group of 24-28 years with +0.66 SD. The postgraduate (77.3%) individuals were more affected as compared only graduate counterparts. Furthermore, majority complained of neck pain (65.8%) followed by back (64%) & shoulder (59.6%) pain. The study also found out that majority of the dentists (95.6%) have a reduction in activity due to MSDs.

4. DISCUSSION

The profession of dentistry is considered one of the most vulnerable for the development of workrelated musculoskeletal disorders [9]. Dental surgeons face a set of unique problems such as: difficult procedures, time related pressure, fearful patients, staff problems and the repetitive nature

of the skilled job [10]. The elaborated results appear to be powerful and robust. Findings from this study are in line with the literature on similar studies, conducted to confirm what is already known or what other studies may have reported in similar settings.

The results of this study showed that overall frequency of MSDs among dentists practicing in Hyderabad is high (87%). A similar kind of study carried out in Brazil by De Carvalho et al. [11] revealed that around 76% of the dentists working face musculoskeletal disorders during their practice [11]. Another, cross sectional survey carried out in KPK Pakistan by Kahlid Rehaman et al. [12] in 2013 found out MSDs in 47% of respondents [12]. Another comparative study conducted by T Rambabu et al. [13] among physicians, surgeons and dentists in India revealed that the dentistry was the profession with highest frequency of musculoskeletal disorders that was 61% [13].

Majority that is 65% of the dentists with musculoskeletal disorders were found to be in age group of 24-28 years in our study, with decrease in frequency of MSDs with age. This trend might be attributed to the fact that old practitioners take less number of patients as compared to the young practitioners who

Table 1. Frequency percentage for gender, age and education

Components		Frequency	
		Number N=132	Percentage Total=100%
Gender	Male	80	60.6
	Female	52	39.4
Age (Years)	24-28	86	65.2
	29-33	34	25.8
	34-38	12	9.1
Education	Graduate	30	22.7
	Postgraduate	102	77.3

Table 2. Frequency percentage for working environment

Components		Frequency	
		Number N=132	Percentage Total=100%
Position of working	Sitting	06	4.5
	Standing	27	20.5
	Both	99	75
Working hours/day	4-5 hours	56	42.4
	7-8 hours	59	44.7
	9-10 hours	17	12.9
Working Environment	Suitable	86	65.2
	Unsuitable	46	34.8

Table 3. Frequency percentage for working position

Components	Frequency			
	MSD Patients		Non-MSD Participants	
	Number N=114	Percentage Total=100%	Number N=18	Percentage Total=100%
Position of working:				
Sitting	04	03%	02	11%
Standing	26	23%	01	05%
Both	84	74%	15	84%
Working environment:				
Suitable	74	65%	13	72%
Unsuitable	40	35%	05	28%

Table 4. Frequency percentage for health related issues

Components	FREQ	UENCY
	Number N=114	Percentage Total=100%
Neck Problem:		
Yes	75	65.8
No	39	34.2
Shoulder Problem:		
Yes	68	59.6
No	46	40.4
Back Problem:		
Yes	73	64
No	41	36
Reduction in Activity due to MS problem:		
Yes	109	95.6
No	05	5.4
Other Locomotive Issues:		
Yes	63	55.2
No	51	44.8

need to develop and sharpen their skills with as much practice as possible. A cross sectional study carried out by Ahmed AS et al. [14] in Egypt revealed some contrasting results with majority of the older age dentists suffering from musculoskeletal disorders, this might be due to socio-demographic differences in the study population of two countries [14].

Awkward posture is also considered one of the major risk factor for the development of MSDs among dentist, as working for long duration in same posture creates pressure on the muscles and development of muscle stiffness [15,16]. The current study found out that the frequency of MSDs was high among the dentists who were practicing the combined dentistry as compared to sitting and standing positions alone. The findings are contrasting with the study carried out by Ahmed AS et al. [14] in Egypt revealed that awkward sitting positions are more likely develop MSDs as compared to standing positions [14].

5. CONCLUSION

After careful consideration, it can be concluded that the Musculoskeletal disorders amongst dentists were found in remarkably high number. Wrong posture and poor physical ergonomics of workspace are attributed to higher incidence of MSDs.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

The ethical approval was taken from the Ethical committee of Liaquat University of Medical and Health Sciences Jamshoro.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/66238>