

SHORT REPORT

Prevalence of musculoskeletal disorders among dentists in teaching hospitals in Karachi, Pakistan

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Abstract

Work-related musculoskeletal pain is common among healthcare professionals, including dentists. This cross-sectional study was conducted to determine the prevalence of work-related musculoskeletal disorders (MSDs) among dentists. This study was carried out from January to April 2016 at various teaching hospitals of Karachi, and comprised 230 dentists. A self-administered questionnaire, adapted from a validated Nordic questionnaire, was distributed among the participants. Descriptive statistics were computed and associations of interest were analysed using chi-square test. Of the 230 forms, 182(79.11%) were included after leaving out the incomplete ones. The overall prevalence of MSDs was 138(75.8%). The most frequent reasons for MSDs were lack of rest 21(15.2%) and having static postures for more than half-an-hour per procedure 38(27.5%).

Keywords: Musculoskeletal diseases, Dentist, Posture.

Introduction

Work-related musculoskeletal pain is commonly experienced by dental professionals and a large number of dentists are at risk of job-related musculoskeletal disorders (MSDs) during their careers.¹ Bedi et al.² reported 68.3% prevalence of musculoskeletal disorders among dentists in India. Dental practitioners usually assume uneasy static postures and maintain awkward positions for long periods while working which can lead to chronic muscular fatigue, pain and continuous physiological damage resulting in career ending disability.^{3,4}

These extended static working postures, causally related to musculoskeletal disorders, vary in distinct specialties of dentistry because different clinical tasks are involved in different specialties.⁵ Yi et al.⁵ in a study reported highest prevalence of neck, upper back and lower back pain in periodontics students and wrists and knee pain in

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prosthodontics and surgery, respectively. Rafie et al.¹ in a study reported that highest prevalence of musculoskeletal pain during the past 12 months was related to the neck (55.9%) as compared to other regions and suggested that there is a significant relationship between the prevalence of musculoskeletal disorders and the number of patients and work hours per week.

Alghadir et al.⁶ found that 85% dentists developed work-related musculoskeletal pain after joining the dental profession. A systematic review conducted by Hayes et al.⁷ demonstrated that musculoskeletal disorders represent significant burden for the dental profession and reported high prevalence of musculoskeletal problems in upper extremities of the body.

Local data on musculoskeletal disorders among dentists is scarce. The present study was planned to explore the prevalence of musculoskeletal disorders among dentists and to identify the risk factors associated with them.

Methods and Results

This cross-sectional study was carried out from January 2016 to April 2016 at various teaching hospitals of Karachi, and comprised 230 dentists. Convenience sampling method was used. Study participants were included irrespective of their academic position i.e. faculty, postgraduate resident, demonstrators, etc. However, fresh graduates and house officers were excluded. Approval was obtained from the ethics review committee (ERC) of the Aga Khan University Hospital (AKUH). An English-language questionnaire adapted from the validated Nordic questionnaire⁸ was distributed among the participants by hand. Written informed consent was obtained from all the participants. The questionnaire was pre-tested on a sample of 30 participants and ambiguities in the questions or responses were removed before its implementation.

SPSS 20 was used for data analysis. Descriptive analysis was done by calculating frequency and proportions of categorical and qualitative data, respectively. Mann-Whitney U test and chi-square test were used to determine the relationship between musculoskeletal disorders with other variables (age, gender, working

Table-1: Distribution of MSDs site among dentists with respect to the years of practice.

Symptomatic site	Years of practice	MSD positive n (%)
Neck	< 5	57 (64)
	5-10	44 (66.7)
	>10	6 (22.2)
Lower Back	< 5	48 (53.9)
	5-10	36 (54.5)
	>10	10 (37)
Shoulder	< 5	45 (50.6)
	5-10	34 (51.5)
	>10	11 (40.7)
Hand/wrist	< 5	35 (39.3)
	5-10	24 (36.4)
	>10	7 (25.9)

MSD: Musculoskeletal disorders.

Table-2: Possible risk factors and their relationship with MSDs.

Risk Factors	Category	MSD Positive n (%)	p-value
Age	<30 years	82 (59.42)	0.001
	>31 years	56 (40.57)	
Gender	Male	53 (66.25)	0.007
	Female	85 (83.33)	
Specialty	Orthodontics	22 (78.5)	0.040
	Operative	52 (82.5)	
	Prosthodontics	6 (42.8)	
Years of practice	General dental practitioner	21 (67.7)	<0.001
	<5years	37 (80.4)	
	5-10years	73 (82)	
	>10years	54 (81.8)	
Reason for MSD	Lack of rest	11 (40.7)	<0.001
	Position maintained for half an hour per patient	21 (15.2)	
	Both	38 (27.5)	
		79 (57.2)	

MSD: Musculoskeletal disorders.

Statistical test: Chi-square test/ Mann-Whitney U test applied. Level of significance was kept at P<0.05.

experience, specialty, awkward posture adaptation etc.). P \leq 0.05 was considered significant.

Of the 230 distributed forms, 190(82.6%) survey forms were received back and of them, 8(4.2%) were excluded due to incomplete data. Of the 182(79.11%) participants, 102(56%) were females and 80(44%) were males. The overall prevalence of MSDs in the present study was 138(75.8%). The distribution of MSD with respect to body site was noted (Table-1), and the association of MSD with respect to dentists' age, gender, specialty and working posture etc. was also noted (Table-2).

Of the 182 forms, the reliability of the information was assessed by repeating one question (site of symptoms). The reproducibility of the question turned out to be 155(85%).

Conclusion

In the present study, the response rate turned out to be 79.11% which was comparable to the survey conducted by Dayakar et al.⁹ (response rate 81.6%). However, our response rate was better when compared to other surveys conducted by Alghadir et al.⁶ (response rate 64.8%).

The current study assessed the prevalence of musculoskeletal disorders and associated risk factors among dentists in Karachi working at various dental colleges. The results suggested that musculoskeletal disorders are very common among dentist population. Females were reported to have more musculoskeletal problems than males. This is in agreement with the data reported by Bedi et al.² Several possible causes of increased prevalence in females could be lower pain threshold, smaller muscle mass and strength, greater willingness to report symptoms, take good care and interest in their health and reporting symptoms more often. Compared to general dental practitioners and other fields of dentistry, high prevalence of MSDs were reported in dentists belonging to the field of operative dentistry. This finding is not consistent with the studies conducted by Yi et al.⁵ who reported high prevalence of MSDs in periodontists and Alghadir et al.⁶ who reported high prevalence among paediatric dentists. The probable reason for these findings could be that in our study sample, there was no dentist who belonged to any of these two specialties. Pakistan has a very limited number of trained dentists in periodontology and paediatric dentistry owing to a lack of residency training programmes in these two disciplines.¹⁰ The routine clinical procedures in both these fields are either performed by general dental practitioners or practitioners who belong to specialty of operative dentistry. In the present study, age group distribution and work experience revealed that younger age group of <30 years, with <5 years of professional experience have greater prevalence of MSDs, which is in accordance with the findings of Zarra et al.¹¹ The possible reasons for this could be more workload or little knowledge of ergonomics and their implications among young dentists or senior practitioners taking up less number of patients.

In dental profession, dentists frequently assume many awkward and unfavourable postures because of performing some extremely precise procedures in a limited workspace i.e. in oral cavity. Zarra et al.¹¹ reported

that an awkward posture adaptation is a significant predictor of musculoskeletal disorders among dentists. Dayakar et al.⁹ showed that static postures maintained for long periods can lead to career-ending problems, injuries and disability. Static postures maintained for prolonged periods of time can result in chronic muscular fatigue and imbalances, which can lead to muscle ischemia, necrosis, pain, joint hypo mobility, disk problems and also predispose soft tissues to adaptively change with time leading to pathological effects and permanent disability.^{3,4} In the present study, dentists were also questioned about their overall general health and any significant musculoskeletal problem present before joining dental profession which revealed that around 91.2% were perfectly healthy and had no musculoskeletal problem before joining dental profession which signifies the importance of the study and the presence of musculoskeletal disorders in dental profession.

The primary limitation of our study was the subjective reporting of pain by the participants. Thus, it is likely that the dentists who had recently experienced musculoskeletal problems would recall such events better than others. This could lead to biased response or there is a probability that dentists might have overestimated their past experiences.

We recommend that dentists should pay attention to their musculoskeletal health to prevent conditions that can harm their professional career.

References

1. Rafie F, Zamani Jam A, Shahrvan A, Raouf M, Eskandarizadeh A. Prevalence of Upper Extremity Musculoskeletal Disorders in Dentists: Symptoms and Risk Factors. *J Environ Public Health* 2015; 2015: 517346.
2. Bedi HS, Moon NJ, Bhatia V, Sidhu GK, Khan N. Evaluation of Musculoskeletal Disorders in Dentists and Application of DMAIC Technique to Improve the Ergonomics at Dental Clinics and Meta-Analysis of Literature. *J Clin Diagn Res* 2015; 9: ZC01-3.
3. Ganiyu SO, Olabode JA, Stanley MM, Muhammad I. Patterns of occurrence of work-related musculoskeletal disorders and its correlation with ergonomic hazards among health care professionals. *Nigerian J Exp Clin Biosci* 2015; 3: 18-23.
4. Valachi B, Valachi K. Mechanisms leading to musculoskeletal disorders in dentistry. *J Am Dent Assoc* 2003; 134: 1344-50.
5. Yi J, Hu X, Yan B, Zheng W, Li Y, Zhao Z. High and specialty-related musculoskeletal disorders afflict dental professionals even since early training years. *J Appl Oral Sci* 2013; 21: 376-82.
6. Alghadir A, Zafar H, Iqbal ZA. Work-related musculoskeletal disorders among dental professionals in Saudi Arabia. *J Phys Ther Sci* 2015; 27: 1107-12.
7. Hayes M, Cockrell D, Smith D. A systematic review of musculoskeletal disorders among dental professionals. *Int J Dent Hyg* 2009; 7: 159-65.
8. Hayes MJ, Smith DR, Taylor JA. Musculoskeletal disorders in a 3 year longitudinal cohort of dental hygiene students. *J Dent Hyg* 2014; 88: 36-41.
9. Dayakar M, Gupta S, Philip G, Pai P. Prevalence of musculoskeletal disorder among dental practitioners. *J Clin Rheumatol Ayurveda* 2013; 1: 22-5.
10. Khan FR, Mahmud S, Rahman M. The need of paediatric dentistry specialists in Pakistan. *J Coll Physicians Surg Pak* 2013; 23: 305-7.
11. Zarra T, Lambrianidis T. Musculoskeletal disorders amongst Greek endodontists: a national questionnaire survey. *Int Endod J*. 2014;47(8):791-801.