

Correlation between Work Experience and Musculoskeletal Disorders among the Dentists of Vadodara, Gujarat, India

Joshi Medhavi H.¹, Desai Devangi S², Singh Lalli M³, Joshi Vaibhavi A⁴

¹Consulting Physiotherapist, Department of Physiotherapy, Arpan Diagnostic and Development Center, Vadodara, Gujarat, India.

²Senior Lecturer, Department of Physiotherapy, Pioneer Physiotherapy College, Vadodara.

³Assistant Professor, Department of Physiotherapy, Khyati Institute of Physiotherapy, Ahmedabad.

⁴MPT Student, Department of Physiotherapy, Shree B.G. Patel college of Physiotherapy, Anand.

Corresponding Author: Joshi Medhavi H

ABSTRACT

Introduction: Occupational diseases are present worldwide where Dentists are found to be at higher risk for developing Musculoskeletal disorders (MSDs) due to the postures attained at work. This leads to excessive exertion which may further result into significant manifestations of discomfort and pain in loading joints. To add to these, the anatomical, physiological and physical characteristics of males and females are disparate so gender bias may become an instinct. However, paucity of data for correlating experience years with MSDs was found in Gujarat. Hence, the present study was undertaken to investigate the co-relation between prevalence rate of MSDs with increase in work experience among the dentists of Vadodara.

Methodology: This was a cross-sectional study where 108 dentists were screened. Amongst them 84 dentists were selected on the basis of inclusion criteria. Informed consent was taken and procedure was explained further. Modified Nordic Musculoskeletal Questionnaire was employed for finding out the prevalence rate. Henceforth, non - parametric tests were used for data analysis; finding out to what extent increase in work experience affects the prevalence rate of MSDs.

Result: Present study shows positive co-relation between increase in work experience and MSDs prevalence (Co-relation coefficient - of experience: 1.000 and of MSDs : 0.861). It was also observed that females have more prevalence compare to males ($p < 0.001$).

Conclusion: It is inferred that with increase in work experience due chances of getting MSDs significantly increases. Moreover, females are more prone. Thus, ergonomic advices; Physical therapy and early interventions prove to be very effective in declining the rate of MSDs to a notable extent.

Key words: MSD, Dentists, Vadodara, Work experience, females

INTRODUCTION

In the past decades, musculoskeletal disorders (MSD) have become very familiar worldwide. [1] According to WHO, it is defined as any health problem of the locomotor apparatus including all forms of reversible, light, transitory disorder or irreversible, disabling injuries [2] of the nerves, tendons, muscles, bones, joints, ligaments, spinal disc, cartilage and blood

vessels. [3,4] They are related with repetitive and demanding working conditions which continue to represent one of the biggest problems in industrialized countries. [5] They are the common cause of work related disability in varied range of professions [6] and according to studies dentists typically report a higher incidence, more frequent and worse MSD defects than any other high risk medical professionals. [7,8]

Dental practitioners in dentistry training and practice environments are challenged with a number of occupational health barriers. They are prone to physical and psychological stressors which are aggravated more by the work environment. [9] A number of studies have found that the mechanisms leading to work-related musculoskeletal pain are multi - factorial. This pain can be attributed to numerous risk factors including prolonged awkward static postures (stooping, slouching, ducking); repetitive movements of neck & shoulder flexion/abduction; lack of upper extremity support; frequent & prolonged use of vibrating tools; inadequate work breaks; coping with patient's anxieties - mental stress; precision required with work; suboptimal lighting; poor positioning; genetic predisposition; physical conditioning; age; time pressure; high demand and poor social support. [5,10-12]

Although, findings regarding the psychosocial work environment of dentists have been inconclusive suggesting either a poor or a satisfactory psychosocial work environment; additionally the anatomical, physiological and physical characteristics of males and females are disparate so gender bias may become an instinct. Moreover, studies depicted that one of the most devastating physical factor is postures attained at work which requires more than 50 percent of the body's muscles to contract to hold the body motionless while resisting gravity. The static forces resulting from these postures have been shown to be much more taxing than dynamic (moving) forces thereby manifesting distinctly in MSD pains as the age and years of clinical work since the graduation increases and has significant association. [13-15]

The overall prevalence rate of MSDs in dentistry differs from 63-93 % worldwide [16] with as high as 92.4 % in Gujarat [5] and 100% in Mangalore, [17] India.

Several studies evaluating the prevalence rate of MSDs with affection of specific anatomical site their gender preference in India are found [5,7,13,18,19] but

no studies finding relationship between MSDs and work experience has been done. However, rising paucity of literature has been reported previously in India regarding association of increase in work experience with MSDs. Thus, the present study aims to investigate the co-relation between prevalence rate of MSDs with increase in work experience among the dentists of Vadodara city, Gujarat, India.

METHODOLOGY

This community based co-relational study was conducted from October 2018 to March 2019 for Dentists through convenient sampling method from different areas of Vadodara city. Out of 108 dentists, 84 dentists meeting the inclusion criteria after screening on the basis of age, work experience and the anatomical site for pain of MSDs were selected.

Subjects between the age of 24 – 50 years with regular clinical practice of min. 3 years, having complain of MSD pain in neck, upper-limb and back region and willing to participate were included whereas dentists with physical disabilities before joining the profession, who have had any orthopedic condition in recent past such as fracture were excluded from the study.

Written consent was taken prior to the commencement of the study from each subject thereby the purpose and procedure was explained further to them.

Each subject was given an assessment form consisting of questions regarding their demographic details, pain history, type of treatment received and Modified NMQ and was asked to fill-up by subjects themselves.

Modified NMQ was developed from a project funded by the Nordic Council of Ministers. The aim was to develop and test a standardised questionnaire methodology allowing comparison of low back, neck, shoulder and general complaints for use in epidemiological studies. The tool was not developed for clinical diagnosis [20] and can be used as a questionnaire or as a structured interview. It was used only to study the

prevalence of MSDs over 12 months as an outcome measure. [21] Kappa values for the reliability assessment ranged between 0.57 and 1.00 for the 27 dichotomous variables. The criterion validity kappa obtained for the agreement between participants clinical records and questionnaires was $k = 0.76$. [22]

Data were collected and analyzed for co-relation between work experience and prevalence rate of MSDs; further comparison was also done among genders to note any difference if present.

RESULT

Non-parametric tests for finding Co-relation between work experience with prevalence rate and comparison between gender for MSDs prevalence was done using SPSS 20 and graph were generated using Microsoft Excel 2013.

Table :1 Descriptive statistics

Age	Number of individuals	Mean	SD
Male	42	29.8	±3.08
Female	42	29.4	±3.06

Table : 1 shows the gender distribution with age group as 29.08 years ± 3.08 Mean \pm SD for Males and 29.4 years ± 3.06 Mean \pm SD for Females is reported among the total study population.

Table :2 Co-relation between work experience with prevalence rate of MSD

		Experience	MSD
Experience	Co-relation co - efficient	1.000	0.861
	Sig(2 tailed)/		0.001
	N	84	84
MSD	Co-relation co-efficient	0.861	1.000
	Sig (2 tailed)/	0.001	
	N	84	84

Table : 2 demonstrates the positive correlation; that with increase in number of years of work experience, there is significant increase in the prevalence rate of MSDs.

Table : 3 Comparison of Gender for MSDs

	MSD
Mann – Whitney /	0.001
Z	9.110
Asymp (2 tailed)	0.001

Table : 3 depicts that females are at higher risk of developing MSD defects than the males .

DISCUSSION

The present study reveals that years of work consequently increase the number of illnesses of the musculoskeletal system, thereby years of work experience has been significantly associated with increasing disorders of the musculoskeletal system.

Globally, the prevalence of occupational health-related problems is a concern among dental practitioners and MSD being one of the principal and most prevalent; which reasons back to the multi - factorial origin. A number of studies have found that occupational health related problems are on the increase, despite of new and innovative equipment being developed and used in dental practice. [23-25] As previous studies have shown that dentists experience common MSD symptoms with high prevalence rate, it is important to find its co-relation with the years of work experience among the dentists.

It is generally accepted that poor practice such as poor posture when working in a long time can be shown to cause cumulative effect of MS pain - chronic fatigue, discomfort, and pain, even if the soft tissues are not structurally altered developing the MSD symptoms. [9,14] Additionally, dentists with more work experience have spent more time with patients and eventually experience complicated pain. [26]

Similar study form China supports these finding where, *years of clinical work* correlated with the presence of MSDs among dental students. Those students with more than four years of clinical experience were more likely to develop MSDs, and those students with less than two years of clinical experience reported fewer symptoms which shows *clinical time* and *desk time* positively correlate with the occurrence of MSDs. [15]

Some other studies which reported that MSDs increases with increase in years

of work and were significantly associated with work experience at the unvarient level supporting the previous findings. [1,9,24,27-29]

In contrary, other studies showed that MSD pain was negatively correlated with experience years. [30,31] Some researches and scholars believed that dentists with a lot of experience learn to adapt their work posture and avoid MSDs, or that dentists with MSDs might leave dentistry as a profession. [32]

Furthermore, these review showed the consistency with the previous studies which encounters that females have significantly higher incidence rate and are more prone to develop MSDs defect when compare to their counterparts. [1,19,26,29]

This is accounted for by difference in their anatomical and physiological body built such as higher body weight, smaller height and differences in muscle strength & composition which makes females more prone for MSDs than males.

However, this finding contradict with many previous studies, which reported that there were no significant differences among male and female dentists [33,34] or male dentists showed a higher prevalence of MSD symptoms than females. [14]

Though, preventive measures should always be considered while handling the patients. In accordance to decrease the prevalence of MSDs in later years of work, the role of ergonomics, healthy work environment, prevention of injury, counseling, etc., needs to be emphasized during training of health professionals so that they can use their body force efficiently and effectively without putting an extra load on any specific part of the body. [35] To add to this, emphasizing more on females, they are likely to benefit from additional improvements of the work environment, targeted prevention and intervention aimed at reducing these risks. [29]

Prevalence and severity of various MSDs decreased by performing regular exercises among large group of dentists. [33] Exercise strengthens the muscles and increases the blood flow and oxygen and

nutrient supply to muscle cells and prevents MSDs. The efficacy of exercise therapy for pain relief has reported to be higher than some other methods. [36,37] Exercise stimulates the production of natural pain-inhibiting hormones, and by increasing the pain threshold it prevents or relieves pain. [36,38-40]

Nevertheless, there are limitations of the study too. Firstly, the smaller sample size and secondly as the data are collected by self-report questionnaires, memorial mistakes could hardly be avoided.

Therefore, more perspective research is needed on the musculoskeletal problems in dentists, with an emphasis on larger sample size and correlating other factors to generalize the results and conclusions, and thereby formulate some guidelines to prevent or minimize work-related MSDs in dentists in future.

CONCLUSION

Present study shows that there is a positive co-relation between Work experience and prevalence rate of MSDs also statistically difference was observed when comparison was done among genders. Therefore, along with the conventional method of treatment, awareness of Physiotherapy role in MSDs, ergonomic advices and precautionary activities can be included while emphasizing more on females, their risk factors, early interventions can be made.

REFERENCES

1. Alexopoulos E. C., Stathi I., Charizani F, et al. Prevalence of musculoskeletal disorders in dentists. BMC musculoskeletal disorders. 2004;5:1
2. Tayyaba Saleem, Syeda Nida Zainab, et al. Prevalence of causative factors for musculoskeletal disorder and their awareness among dental surgeons. Pakista Oral & Denatl Jouranl Vol 35, No. 2(jine 2015).
3. Shaik A. R., Rao S. B., Husain A. et al. Work-related musculoskeletal disorders among dental surgeons: A pilot study. Contemp. Clin. Dent. 2011;2:308-312.

4. Hayes M , Taylor JA , Smith D. Predictors of work-related musculoskeletal disorders among dental hygienists. *Int J Dent Hygiene* 2012;6(4):265–9.
5. Chetna Batham, Sandul Yasobant. *Indian Journal of Dental Research – 2016, Vol 27, issue 3.* 236 – 241.
6. Faisal Alyahya, Khalid Algarzaie, et al. awareness of ergonomics & work related musculoskeletal disorders among dental professionals & students in Riyadh, Saudi Arabia. *J. Phys. Ther. Sci.* 30 ; 770 – 776, 2018.
7. Rambabu T, Suneetha K. Prevalence of Work Related Musculoskeletal Disorders Among Physicians, Surgeons and Dentists : A Comparative Study. *Annals of Medical and Health Sciences Research | Jul-Aug 2014 | Vol 4 | Issue 4,* 578 – 582.
8. Shaik N, et al. Occupational hazards in modern dentistry. *International Journal of Experimental Dental Science,* 2013; 2(1): 33-40.
9. Puriene A, Janulyte V, Musteikyte M, et al. General health of dentists. *Literature review. Stomatologija* 2007; 9(1): 10-20.
10. Suneetha Koneru., Rambabu Tanikonda. Role of yoga and physical activity in work – related musculoskeletal disorders among dentists. *J Int Soc Prevent Communit Dent* 2015;5:199-204
11. Natasa P., Petrović, Vanja, Marković, Dejan, et al. / Assessment of risk and protective factors for MS pain. *Work* 57 (2017) 573 – 593.
12. Martin MM, Ahearn, et al. An introduction to ergonomics: risk factors, MSDs, approaches and interventions. A report of the ergonomics and disability support advisory committee to council on dental practice, Chicago , 2012.
13. Sayli Paldhikar, Samprada Bhatkar, Snehal Ghodey. Incidence And Study of Occupational Factors Associated With Low Back Pain In Dentists In Pune Region India. *IOSR Journal of Dental and Medical Sciences (JDMS) Volume 3, Issue 2 (Nov.-Dec. 2012), PP 08-12*
14. Somsiri Decharat, Piriyalux Phethuayluk, Supandee Maneelok. Prevalence of Musculoskeletal Symptoms among Dental Health Workers, Southern Thailand. *Advances in Preventive Medicine, Volume 2016, Article ID 5494821, 6 pages.*
15. Jianru YI, Xiangxiang Hu, Boxi Yan, et al. High and specialty-related musculoskeletal disorders afflict dental professionals even since early training years. *J. Appl. Oral Sci.* vol.21 no.4 Bauru July/Aug. 2013, 376 – 382.
16. Sultana N, Mian M A H, Rubby M G, et al. Musculoskeletal Disorders in Dentists: A Systematic Review. *Update Dental College Journal Vol. 7 No. 2 | October 2017,* 38 – 42.
17. Vijaya K. Kumar, Senthil P Kumar, Mohan R Baliga. Prevalence of work – related musculoskeletal complaints among the dentists in India : A national cross – sectional survey.
18. Haritha Pottipalli Sathyanarayana, Sudhakar Subramanian, Abhay Pandey. Work Related Musculoskeletal Disorders among dentists in Chennai- A Questionnaire Survey. *International Journal of Current Research and Review Vol. 04 issue 11 June 2012,* 38 - 41.
19. Farah Riyazuddin Munshi, Edrish Saifee Contractor, Muzammil Munshi Prevalence of musculoskeletal disorders and psychosocial aspects among dentists - A survey. *International Archives of Integrated Medicine,* 2016; 3(8): 185-192.
20. Kuorinka I, Jonsson B, Kilbom A, et al. Standardized Nordic questionnaires for the analysis of musculoskeletal symptoms ,*Appl Ergon,* 1987,vol.18 (pg.233-237).
21. Joanne O.Crawford. The Nordic Musculoskeletal Questionnaire. *Occupational Medicine,Vol.57,4,June 2007,*pg.300-301.
22. Elise P Legault et al. assessment of musculoskeletal symptoms & their impacts in the adolescent population; adaptation & validation of a questionnaire. *BMC Pediatrics* 2014 14:173.
23. de Carvalho M. V., Soriano E. P., de Franca Caldas A. Jr, Campello R. I., de Miranda H. F., Cavalcanti F. I. Work-related musculoskeletal disorders among Brazilian dental students. *J. Dent. Educ.* 2009;73:624-630.
24. Barlean L, D_nil_I, S_veanu I, Balco_C. Occupational health problems among dentists in Moldavian Region of Romania. *Revista medico-chirurgicala a Societatii de Medici si Naturalisti din Iasi* 2013; 117(3): 784-788.

25. Osazuwa Peters N, Azodo CC, Obuekwe ON. Occupational health issues of oral health care workers in Edo State, Nigeria. *International Dental Journal* 2012; 62(3): 117-121.
26. Soares JFF, Sundin O, et al. age and musculoskeletal pain. *Int J Behave Med* 2003;10:181-90.
27. Al Wazzan KA, et al. back & neck problems among dentists and dental auxiliaries. *J Contemp Dent Pract*, 2001, 2; 17-30.
28. Ratzon NZ, et al. musculoskeletal symptoms among dentists in relation to work posture. *Work* 2000;15:153-8.
29. Petra Lindfors, Ulrica von Thiele, Ulf Lundberg. Work characteristics and upper extremity disorders in female dental health workers. *J Occup Health* 2006;48:192-7.
30. Leggat PA, Smith DR. musculoskeletal disorders self-reported by dentists in Queensland, Australia. *Aus Dent J* 2006; 51:324-7.
31. Finsen L, Cristensen H, et al. Musculoskeletal disorders among dentists and variation in dental work. *Appl Ergon* 1998;29:119-25.
32. Leggat PA, Kedjarune U, et al. Occupational health problems in modern dentistry: a review. *Ind Health* 2007;45:611-21.
33. Yasobant S, Rajkumar P. Health of the healthcare professionals: A risk assessment study on work-related musculoskeletal disorders in a tertiary hospital, Chennai, India. *Int J Med. Public Health*. 2015;5:189-95.
34. Rabia Sannam Khan, Fatima Ahmad, Muhammad Sabih Merchant. Prevalence of work related musculoskeletal disorders (MSD) among dentists. *International Journal of Contemporary Medical Research* 2017;4(5):1208-1211.
35. Ahmad Alghadir, Hamayun Zafar, et al. work related musculoskeletal disorders among dental professionals in Saudi Arabia. *J. phys. Ther. Sci* .27:1107-1112,2015.
36. Pooja Sharma, Vineet Golchha. Awareness among Indian dentist regarding the role of Physical activity in prevention of work related musculoskeletal disorders. *Indian J Dent Res*, 2011;22:381-4.
37. Ferreira ML, Ferreira PH, Latimer J, Herbert RD, Hodges PW, Jennings MD, et al. Comparison of general exercise, motor control exercise and spinal manipulative therapy for chronic low back pain: A randomized trial. *Pain*. 2007 Sept; 131(1-2):31-7.
38. Rasmussen-Barr E, Nilsson-Wikmar L, Arvidsson I. Stabilizing training compared with manual treatment in sub-acute and chronic low-back pain. *Manual Ther*. 2003 Nov;2008(4):233-41.
39. Hayden JA, Van Tulder MW, Tomlinson G. Systematic review: strategies for using exercise therapy to improve outcomes in chronic low back pain. *Ann Inter Med*. 2005 May; 142(9):776-85.
40. Soukup MG, Lönn J, Glomsröd B, Bö K, Larsen S. Exercises and education as secondary prevention for recurrent low back pain. *Physiotherapy Res Inter*. 2001 May; 6(1):27-39.

How to cite this article: Medhavi HJ, Devangi SD, Lalli MS et.al. Correlation between work experience and musculoskeletal disorders among the dentists of Vadodara, Gujarat, India. *International Journal of Research and Review*. 2019; 6(12):27-32.
