

# Occupational Health of Indian Dental Professionals... Are We Really Targeting? Narrative Review

Tejashree D\* and Ajit D

School of Physiotherapy, D.Y.Patil University, Nerul, Navi Mumbai, India

## Review Article

Received: 10/03/2017

Accepted: 10/05/2017

Published: 15/05/2017

### \*For Correspondence

Tejashree Dabholkar, Associate Professor,  
School of Physiotherapy, D.Y.Patil  
University, Nerul, Navi Mumbai-400706,  
India, Tel: 9167047445.

**E-mail:** tejashreedabholkar81@gmail.  
com

**Keywords:** Dentist, Ergonomics,  
Musculoskeletal disorders, Occupational  
health

## ABSTRACT

**Background:** Increasing awareness of oral health had seen greater surge in population visiting dental specialists in India. Dental profession has wide scope and lots of demand handling such population. This puts lots of demands on dental professionals and their health itself. Job demands itself needs them to work with fine skills and expertise. Plethora of research is available from across the globe. In India this research area is still blooming.

**Objectives:** To appraise the literature related to current evidence in the field of occupational health of dental professionals.

**Methodology:** Full text articles targeting various aspects of occupational health of dental professionals were searched. Use of Boolean operator "and" along with terms like ergonomics, dental profession and prevalence and musculoskeletal disorders (MSD) were done to search relevant articles. Articles involved were randomized controlled trials, systematic reviews, Literature reviews. In addition, the reviewers manually checked for any articles in peer reviewed journals.

**Results:** Studies reveal high prevalence of musculoskeletal disorders (MSD) of upper quadrant, neck and back. Ergonomic considerations for dental professionals are suggested but implementation of these remains a question. Precarious literature review is available relating to studies highlighting interventions and evaluation and assessment pertaining to causative factors.

**Conclusion:** Various studies raise an alarm against increased prevalence of musculoskeletal disorders. Need of ergonomic interventions is stressed in literature. But lot of research related to posture analysis, muscle work, cumulative trauma disorders are lacking.

## INTRODUCTION

In India, dental profession is emerging as one of the top most profession. Changing trends in technology, dental practice, instruments, and expert dental professionals has made Indian dental practices more popular worldwide. Increase demand on these professionals makes them vulnerable for various cumulative trauma syndromes and MSD. Several studies are probing occupational health of dental professionals across the globe. Indian research and literature have shifted its attention to this since last few years. This study predominantly targets literature and studies put forward by Indian researchers. An Insight into which could help in raising important issues for better occupational health of dental professionals.

## METHODOLOGY

**Searches and Selection:** Peer reviewed articles that predominantly focused on prevalence, ergonomics; interventions related to dental profession were included in this review. Articles were restricted for last five years i.e., year 2011. The articles were identified via a search of PubMed, Cochrane library and Google Scholar. Articles like review reports and primary research were included. Reference lists from identified articles and additional citations of interest located manually were also searched. Research available in India is been categorized in to three categories for review purpose.

1. Articles related to prevalence of musculoskeletal disorders in dentists.
2. Articles related to intervention and assessment.
3. Review articles suggesting ergonomic interventions.

Articles selected in study were mainly case control trials, review articles, meta-analysis, and cross-sectional studies (**Tables 1 and 2**).

## RESULTS

**Table 1.** Summary of articles assessing prevalence of MSD in dentists.

Author	Results of prevalence studies
Sumit M and Prakash P <sup>[1]</sup>	77 randomly selected dentists were interviewed. Prevalence of pain was 63.6 percent. Back was the commonest site for pain.
Muralidharan <sup>[2]</sup>	Seventy-three dental practitioners participated in the study of which seventy-eight percent had a prevalence of at least one MSD symptom over the past twelve months. Most common areas affected by MSD in order of magnitude were neck (52%), low back (41%), shoulders (29%) and wrist (26%).
Madaan V and Chaudhari A <sup>[3]</sup>	Total of 81% prevalence of musculoskeletal pain among the Dental students. 81% were unaware of the correct posture for dental clinical procedures. Maximum pain was observed in the hand (92%) followed by wrist (85%) and lower back (72%).
Dayakar MM <sup>[4]</sup>	93.87percent had prevalence of at least one musculoskeletal symptom in past 12 months. Most prevalent areas according to magnitude of involvement were back, neck, hand, shoulder and wrist.
Ananya S <sup>[5]</sup>	The results showed that 37% suffered from neck pain, 52% shoulder pain, 29% and 38% had pain in the upper back and lower back respectively, 21% had pain in the hand and 37% had pain in the wrist.
Kaul R <sup>[6]</sup>	A questionnaire survey was carried out among 150 randomly chosen dental practitioners in Bengaluru. MSD and mental health related issues were found to have a prevalence of 82% and 75.3% in this study.
Vishakha S <sup>[7]</sup>	Greatest prevalence of neck pain was seen when years of practicing dentistry exceeded ten years of practice, working more than 50 hours a week (more than 8 hours a day in a 6 day week) and taking 2 or less than 2 breaks a day.
Siddharth MS <sup>[8]</sup>	Incidence of neck and back pain among dentists is higher than general population. This may be attributed to extreme postures that may be attained during the clinical work and which may be extreme in pediatric dentists.
Shankar R <sup>[9]</sup>	54.84% (n=136) reported at least one episode of backache, 51.61% (n=128) reported neck pain, 19.35% (n=48) reported pain in the shoulder and 32.25% (n=80) reported pain in the wrist and/or hand in the previous 12 months.
Dabholkar T <sup>[10]</sup>	Commonly affected area among male subjects was the neck in institutional practitioners and the lower back in private practitioners. In females, the neck was the maximum area of pain followed by the wrist and hand in institutional as well as private practitioners. This study revealed that almost all the participants reported musculoskeletal pain.

**Table 2.** Summary of articles related to intervention and assessment.

Author	Results	Intervention	Tool of Assessment
Karibasappa GN <sup>[11]</sup>	Masters in dental sciences (MDS) graduates had better knowledge, attitude than Bachelor of dental sciences (BDS) Graduates towards dental ergonomics.  Increase in knowledge and attitude didn't result in the desired behavior.	Nil	Questionnaire related to knowledge, attitude and behavior related to ergonomic practices
Bhagwat S <sup>[12]</sup>	The questionnaire for the study included a series of questions, when coupled with the rapid entire body assessment (REBA) scale, a relation was observed between the severity of the pain experienced by the dentists and their REBA score.	Nil	Ergonomic risk using REBA.
Dabholkar TA <sup>[13]</sup>	BMI has shown strong association with CTS in institutionalized as well as private dental practitioners irrespective of gender. Wrist ratio has found association with CTS in mainly institutionalized male and private female practitioners.	Nil	Assessment of carpal tunnel syndrome using carpal tunnel syndrome questionnaire(CTSQ),special tests like Phalen test, hand anthropometry
Gupta D <sup>[14]</sup>	The biomechanical exposure analyzed (rapid upper limb assessment, occupational repetitive action) showed strong association with various cumulative trauma disorders  Assessed by (neck disability index, disabilities of arm, shoulder, hand, and carpal tunnel syndrome questionnaire).	Nil	RULA, neck disability index, disabilities of arm, shoulder, hand, and carpal tunnel syndrome questionnaire

Gandhi P <sup>[15]</sup>	Complementary and alternative medicine represents a group of diverse medical and health care systems, practices, and products that are not considered to be part of conventional medicine. CAM Therapeutics have improved quality of life and have given a new meaning to it, especially to dentists who suffer from MSD.	Complementary and alternative medicine(CAM)	NIL
Tejashree D <sup>[16]</sup>	32% back pain and 35% neck pain incidence was noted. The biomechanical exposure analyzed using REBA showed significant correlation with OBPDQ. This study suggests that, there was definite association with spinal disability with work related exposures in the study.	NIL	Neck disability index (NDI) and Oswestry Low Back Pain Disability Questionnaire (OBPDQ).  Ergonomic risk using REBA

## DISCUSSION

Paucity of literature available probing in health issues of dental professionals of India were observed in this study. Maximum studies obtained were related to assessment of prevalence whereas studies targeting intervention or body function assessment were sparse. Dental profession is changing in terms of technology, techniques, and instruments. Standing dentistry is moving towards seated dentistry. These changes could have shifted Prevalence pattern of musculoskeletal disorders (MSD) in dental professionals. In a study by, 65% of dentists surveyed experienced and complained of back pain. A study conducted fifty-four years later showed that 81% of dentists surveyed experienced and complained of neck, shoulder, wrist and back pain. In our literature search we were not able to comment on this pattern of prevalence as compared to old literature as very less previous literature before is available. There were very few Indian studies related to health of dental professionals before 2011. Recently in last five years health issues of dentists were given much priority. All the articles related to prevalence are targeting various states of India. Though work demand vary in these areas, some of the body areas were found to be commonly affected. Almost all the studies indicated Lower back, neck, shoulder and upper quadrant to be a common area of involvement. Study done by<sup>[5]</sup> had documented prevalence in various specialties of dental profession. Irrespective of specialty neck, upper back, lower back, hand was found to be most prevalent area. Review article by Saxena P et al.<sup>[17]</sup> and study by Biswas R et al.<sup>[18]</sup> discussed how Prevalence of Upper Extremity Musculoskeletal Disorder (UEMSD) is common in dental professionals. Study done by<sup>[9]</sup> had analyzed practice patterns and their influence on prevalence of musculoskeletal disorders. In this study pain related to various dental procedures were documented. Endodontic, scaling, molar extractions and impactions, restorative and conservative procedures were documented as most painful dental procedures. Study done by Madaan V and Chaudhari A<sup>[3]</sup> analyzed prevalence of musculoskeletal disorders in students which suggested a high prevalence (81%) of musculoskeletal pain among dental students and clearly indicates a concern for the future occupational health of this group. Review articles available in India all have discussed various issues including practice techniques, use of devices like magnifier in order to reduce strain on areas like back and neck<sup>[11,16]</sup>. Based on a nonsystematic literature review<sup>[19]</sup> gave multiple specific recommendations for dental professionals. Physiotherapeutic principles were applied to this population. Very few Indian studies have quoted significance of physiotherapeutic interventions for dental professionals. Personal characteristics of professionals like demographic, psychosocial and anthropometric factors does affect work performance. Only one study<sup>[13]</sup> has correlated of anthropometry with incidence of carpal tunnel syndrome of hand in dental surgeons. In this study some of the anthropometric measures like body mass index and wrist ration have shown correlation with incidence of carpal tunnel syndrome. Ergonomic objective measures like Rapid Entire Body Assessment (REBA), Rapid Upper Limb Assessment (RULA) were used for postural assessment and to analyze biomechanical risk factors in studies done by Biswas R et al.<sup>[18]</sup>. These studies have put Indian dental professionals in to medium to high risk categories irrespective of work setup or gender. Mental health were considered as important parameter for development of MSD. In India where awareness of oral health is very less, it is a tiring job for dentists to cope up with patient demands and maintenance of technical expertise .This becomes additional burden on dentists. Study done by Kaul R et al.<sup>[6]</sup> D 7 have highlighted these features of dental professionals. Studies related to intervention in dental profession are scanty. Study done by Gupta D et al.<sup>[14]</sup> has suggested that Complementary and alternative medicine(CAM) have improved quality of life and have given a new meaning to it, to dentists who suffer from MSD. Review articles have suggested certain upper quadrant stretches and aerobic exercises for dentists, in order to stay fit. Survey done by Kumar DK et al.<sup>[20]</sup> utility of yoga as an alternative therapy for occupational hazards among dental practitioners have suggested that medical professionals are not well aware of the health benefits of yoga to treat these occupational hazards. Hence awareness should be created among dental practitioners about benefits of yoga, through continuing dental education programs to effectively manage these occupational hazards. Study done by Ramamoorthy A et al.<sup>[21]</sup> Insights into Ergonomics among Dental Professionals of a Dental Institute and Private Practitioners in Hubli-Dharwar Twin Cities, India have stated that Participants had considerable awareness and behaviour toward ergonomics in dental practice. The high attitude score indicates stronger acceptance of ergonomics principles and guidelines during routine dental procedures. In spite of wide variety of literature available on Indian dentists, evaluation based studies are very few. Study presented in International Conference on Humanizing Work and Work Environment 2015 Mumbai by<sup>[22]</sup> have assessed effect of fatigue on forearm muscle work and hand function. This study stated as fatigue sets in, hand dexterity gets affected. This could affect dental performance. Hence frequent rest breaks are suggested. Study presented by Dabholkar T et al.<sup>[23]</sup> and Dabholkar T et al.<sup>[24]</sup> in 2015 in same International Conference on Humanizing Work and Work Environment 2015 have analyzed forearm muscle work in various dental procedures like scaling and drilling. This study

suggested that Repetitive dental tasks can increase muscle work. Small extrinsic muscles of hand like Flexor digitorum profundus (FDP) and Flexor digitorum superficialis (FDS) show excessive muscle work while performing fine dental procedures. Wrist stabilizers like Extensor Carpi Radialis Longus (ECRL) and Flexor Carpi Ulnaris (FCU) showed increased muscle activity. There are no other Indian studies related to such assessments. In India where dental profession has seen extensive rise in terms of technology, application, world class facilities, very less attention is given to professional health and relevant research probing this aspect. This has raised an alarm related to occupational health of dental practitioners. Hence this article conclude that research interest is now probing towards health of Indian dental professionals. But even though prevalence is being studied extensively and review about MSD are available, intervention and assessment related studies are scanty. Identification of determinants of occupational injuries and exploration of etiology could give more insight in to preventive aspects.

## REFERENCES

1. Sumit M and Prakash P. A study on occupational pain among dentists of surat city. *National J of Community Medicine*. 2011;2:116-118.
2. Muralidharan, et al. Musculoskeletal disorders among dental practitioners: does it affect practice? *Epidemiology Research International*. 2013;1:1-6.
3. Madaan V and Chaudhari A. Prevalence and risk factor associated with musculoskeletal pain among students of mgm dental College: A cross sectional survey. *J of Contemporary Dentistry*. 2012;2:22-27.
4. Dayakar MM, et al. Prevalence of musculoskeletal disorder among dental practitioners. *ASL Musculoskel Dis*. 2013;1:22-25.
5. Ananya S, et al. Prevalence of musculoskeletal disorders among dental surgeons in different specialties. *International J of Scientific Research*. 2014;3:279-280.
6. Kaul R, et al. Musculoskeletal disorders and mental health related issues as occupational hazards among dental practitioners in the city of bengaluru: a randomized cross-sectional study. *International journal of medical and dental sciences*. 2015;4:589-598.
7. Vishakha S, et al. Neck pain amongst dentists in mumbai: An exploratory study. *J Res Adv Dent*. 2015;4:43-46.
8. Siddharth MS, et al. Prevalence of neck and back pain among pediatric dentists. *NUJHS*. 2015;5:45-47.
9. Shankar R et al. Practice patterns and their influence on prevalence of musculoskeletal disorders among Indian dentists. *Int J Res Med Sci*. 2015;3:3459-3464.
10. Dabholkar T, et al. Prevalence of musculoskeletal disorders in dental surgeons of Mumbai. *J Health Res Rev*. 2015;2:50-53.
11. Karibasappa GN, et al. Dentists' knowledge, attitude and behavior towards the dental ergonomics. *IOSR J of Dent and Med Sci*. 2014;13:86-89.
12. Bhagwat S, et al. Prevalence of musculoskeletal disorders among indian dentists: a pilot survey with assessment by rapid entire body assessment. *World J Dent*. 2015;6:39-44.
13. Dabholkar TA, et al. Correlation of biomechanical exposure with cumulative trauma disorders of upper extremity in dental surgeons. *J Dent Allied Sci*. 2015;4:13-18.
14. Gupta D, et al. Musculoskeletal pain management among dentists: an alternative approach. *Holistic nursing practice*. 2015;29:385-390.
15. Gandhi P, et al. Correlation of REBA with spinal disability in dental surgeons. *Proceedings of the international conference on humanizing work & work Environment*. 2015.
16. Tejashree D, et.al. Correlation of anthropometry with incidence of carpal tunnel syndrome of hand in dental surgeons. *Int J Health Sci Res*. 2015;5:356-360.
17. Saxena P, et al. Work-related musculoskeletal pain among dentists in madhya pradesh, india: prevalence, associated risk factors, and preventive measures. *Asia Pac J Public Health*. 2013;26:304-309
18. Biswas R, et al. Musculoskeletal disorders and ergonomic risk factors in dental practice. *Indian Journal of Dent Sci*. 2012;4:70-74.
19. Valachi B and Valachi K. Preventing musculoskeletal disorders in clinical dentistry: strategies to address the mechanisms leading to musculoskeletal disorders. *J Am Dent Assoc*. 2003;134:1604-1612.
20. Kumar DK, et al. Exercise prescriptions to prevent musculoskeletal disorders in dentists. *J Clin Diagn Res*. 2014;8:13-16.
21. Ramamoorthy A, et al. Survey on utility of yoga as an alternative therapy for occupational hazards among dental practioners. *Journal of natural science, biology, and medicine*. 2015;6:149.
22. Kalghatgi S, et al. Insights into ergonomics among dental professionals of a dental institute and private practitioners in hubli-dharwad twin cities, India. *Safety and health at work*. 2014;5:181-185.

23. Dabholkar T, et al. Effect of fatigue on hand function in dental professionals. Proceedings of the International Conference on Humanizing Work & Work Environment. 2015.
24. Dabholkar T, et al. Assessment of forearm muscle work in various dental activities. Proceedings of the International Conference on Humanizing Work & Work Environment. 2015.