

# Prevalence of Musculoskeletal Disorders in Dental Professionals of Andhra Pradesh, India

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## ABSTRACT

**Introduction:** Musculoskeletal problems have become a significant issue for the profession of dentistry and dental hygiene. The objective of the study was to find out the prevalence and distribution of musculoskeletal symptoms among dentists and interns in the state of Andhra Pradesh.

**Material and Methods:** This survey was conducted in dental colleges and private clinics in major cities of Andhra Pradesh. Total 135 subjects with inclusion criteria about the trouble the dentists faced during the last 12 months that prevented them from regular work, the dentists opinion regarding effect of physical activity on MSD, and a broad comparison between the years in profession, usage of any medication to alleviate pain, and the importance they give to regular physical activity.

**Results:** The prevalence of general musculoskeletal pain ranges between 64% and 93%. The most prevalent regions for pain in dentists have been shown to be the back (36.3-60.1%) and neck (19.8-85%), while the hand and wrist regions were the most prevalent regions for dental hygienists (60-69.5%).

**Conclusions:** Medical treatment and physiotherapy exercise play important role in management of musculoskeletal pain.

**Keywords:** Musculoskeletal Disorders (MDS), Neck, Lower Back, Pain, Physical Activity

## INTRODUCTION

A wide variety of deleterious work environmental factors are proved to affect the physical health of dentists or even aggravate their preexisting disorders. Studies have shown that dentists report more frequent and worse health problems particularly musculoskeletal pain. Dentists commonly experience musculoskeletal pain during the course of their careers. While the occasional backache or neck-ache is not a cause for alarm, if regular pain or discomfort is ignored, the cumulative physiological damage can lead to an injury or a career-ending disability.<sup>1,2</sup>

The objective of the study was to find out the prevalence and distribution of musculoskeletal symptoms among dentists and interns in the state of Andhra Pradesh. The problems faced by the dentists during the past 12 months have been stressed on along with the effect of physical activity on musculoskeletal problems faced by dentists. The importance and time allocated by the dentists and interns to regular physical activities like games and yoga therapy. The experience of any practitioner is of paramount importance in concluding these results, which was included in the study protocol.

## MATERIAL AND METHODS

450 questionnaires concerning analysis of musculoskeletal

symptoms in different parts of the body were given to dental professionals and interns in various dental colleges and private clinics Total 135 subjects are been studied in Visakhapatnam, Hyderabad, Vijayawada, Guntur, Khammam and Chirala cities. All dentists were explained about the study details. Informed verbal consent was sought from all dentists and personnel interview was conducted.

The questionnaire was formulated based on the Nordics' Musculoskeletal Questionnaire. It was divided into 2 parts. A questionnaire about musculoskeletal symptoms in different parts of the body during the last 12 months and their opinion regarding the physical activity has been taken. Years in profession, average work per day, any medication or medical treatment underwent as a part of treatment of MSDs, and their participation in any physical activities was inquired into. For the calculation confidential limit of 95% and allowable error of 10% was considered.

## STATISTICAL ANALYSIS

The data was analyzed using Epi Info 2002 software (Database and statistics software for public health professionals, July 2002). Statistical significance was said to be established when p value is < 0.05 at 95% confidence interval.

## RESULTS

Total 135 subjects are been studied and 63.7% of interns and 91.33% of dental practitioners responded by answering the questionnaire. Mean age of intern participants was 24.7 years and dental professionals being 35.7 years.

### Interns

Few questions were unanswered by the interns. These were not considered and left uncounted in the results of the study. Lower back, Upper back and neck are most common sites of pain reported by 36.6%, 35.9% and 35% interns respectively.

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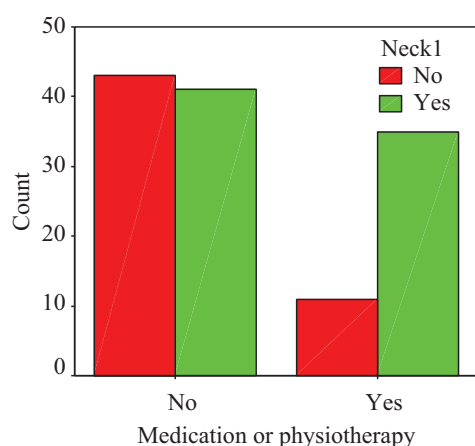
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| Relation between low back pain and age of dental practitioners |     |    |     |
|--|-----|----|-----|
| Age of practitioner in years                                   | Yes | No |     |
| 20-30 years  | 28  | 22 | 50  |
| 31-40 years  | 42  | 29 | 71  |
| 41-50 years  | 5   | 4  | 9   |
| >50 years  | 1   | 4  | 5   |
|  | 76  | 59 | 135 |
| P- Value= 0.0405   |     |    |     |
| Relation between neck pain and age of the dental practitioner  |     |    |     |
| 20-30 years  | 24  | 26 | 50  |
| 31-40 years  | 36  | 35 | 71  |
| 41-50 years  | 4   | 5  | 9   |
| >50 years  | 0   | 5  | 5   |
|  | 64  | 71 | 135 |
| P-Value=0.078  |     |    |     |

**Table-1:** Relation between neck pain, Lower back pain and age of dental practitioners

| Years of profession    | Back Pain present |    |       |
|------------------------|-------------------|----|-------|
|                        | Yes               | No | Total |
| 1-9 years              | 59                | 34 | 93    |
| 10-15 years            | 9                 | 12 | 21    |
| 16-20 years            | 6                 | 2  | 8     |
| >26 years              | 4                 | 9  | 13    |
|                        | 78                | 57 | 135   |
| P- vlaue= 0.045        |                   |    |       |
| Neck pain Pain present | Back Pain present |    |       |
|                        | Yes               | No | Total |
| 1-9 years              | 61                | 36 | 97    |
| 10-15 years            | 11                | 13 | 24    |
| 16-20 years            | 4                 | 2  | 6     |
| >26 years              | 3                 | 5  | 8     |
|                        | 79                | 56 | 135   |
| P- value= 0.033        |                   |    |       |

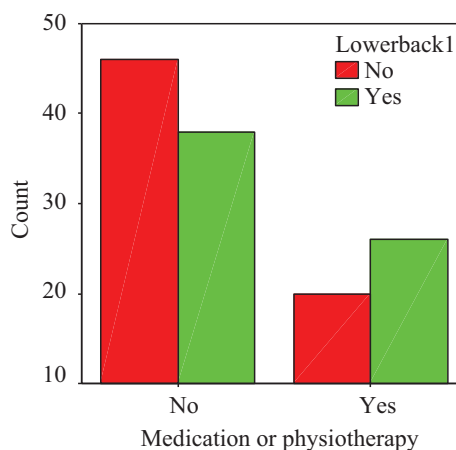
**Table-2:** Relation between back and neck pain to years in profession of dental practitioners



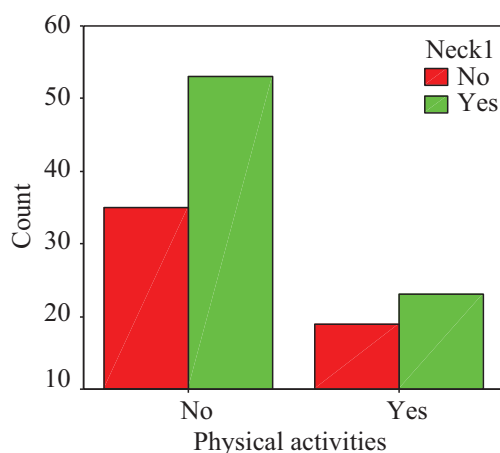
**Figure-1:** Dentist is under any treatment for lower back pain, and if the same are suffering from lower back pain at present

Occurrence of pain at these sites was reported by many studies in the past.

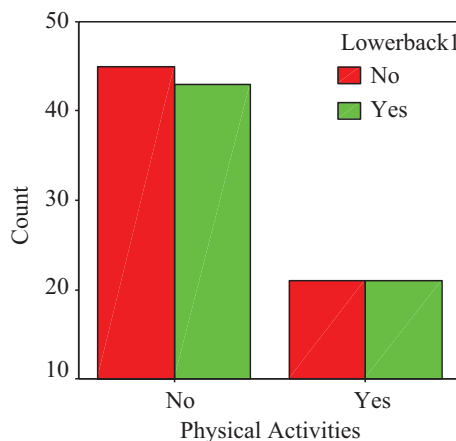
Interns were restricted from doing their regular work had neck and back pain of 20.1% and 12% respectively. More



**Figure-2:** Dentist is under any treatment for lower back pain, and if the same are suffering from lower back pain at present



**Figure-3:** Dentist participates in any regular physical activities, and if the same are suffering from neck pain at present



**Figure-4:** Dentist participates in any regular physical activities, and if the same are suffering from lower back pain at present

alarming fact regarding the care taken by the young dentists is that only 12.2% participate in regular physical activity or any exercise.

#### Dental Practitioners

In contradiction to those results from interns Neck, Lower back, and Upper back are most common sites of pain reported by 55.5%, 46% and 30.2% dentists respectively. 27.1% and 22% of the dentists were restricted from their regular

practice due to neck pain and lower back pain respectively. Only 31.8% of the dentists follow regular physical activities most commonly being yoga, walking and badminton. Demographic details does not show any significance. Both neck pain back pain are significant in relation to age of practice. Dentist is under physiotherapy treatment or medicate for neck pain, and if the same are suffering from neck pain at present are in significance of P- value=0.002. Dentist is under physiotherapy treatment or medication for lower back pain and if the same are suffering from neck pain at present are in significance of P- value=0.01. Dentist participates in any regular physical activities have significant improvement from neck pain. Dentist participates in any regular physical activities have significant improvement from back pain.

## DISCUSSION

Almost all published studies on musculoskeletal problems in dentistry have an observational design. Despite their limitations (difficulty in identifying risk factors and questionable utility for diseases of low incidence and short duration), studies using questionnaires, as in our case, are useful for identifying the prevalence of a disorder, determining the clinical features of patients, and for designing possible preventive strategies.<sup>2</sup>

Our study found that most professionals referred some kind of musculoskeletal pain in the last 12 months, in coincidence with the information found in the literature.<sup>1</sup> The role of age is even more controversial. While there are studies that claim that the frequency of pain remains stable with age,<sup>3,7</sup> others believe that musculoskeletal discomfort is maximum around the sixth decade of life.<sup>5</sup> A third group of authors believe that discomfort is greater in young professionals. In our study, we found young professionals to have a higher incidence of neck pain. This could be due to incorrect working positions, since older dentists use more indirect vision and usually avoid neck overload<sup>8</sup> (Table-1 and 2).

Ignorance of pain in early stage and continuous exposure to aggravating factor ultimately convert mild and moderate pain in to sever disabling pain. Regular exercise was found to be effective in preventing and relieving dental work related pain<sup>3</sup> (Figure-1, 2,3,4).

The dentists are at high risk of neck and back problems due to the limited work area and impaired vision associated with the oral cavity. These working restrictions frequently cause a clinician to assume stressful body positions to achieve good access and visibility inside the oral cavity.<sup>1</sup> Furthermore, dental procedures are usually long and require much more concentration during work. Neck pain and back pain are the most common and troublesome of complaints.<sup>5</sup> Some investigations have shown that the prevalence and location of pain and other symptoms may be influenced by posture and work habits, as well as other demographic factors. Several dental procedures require the dentist to assume and maintain positions that may have potential disadvantages for their musculoskeletal system. Their work with patients is often performed with their arms abducted and unsupported and the cervical spine flexed forward and rotated lead to high

prevalence of pain in back, neck and shoulder region.

The physical load among dentists seems to put them at risk for the occurrence of musculoskeletal disorders. Muscular imbalance, neuromuscular inhibition, and pain and dysfunction may frequently be observed among oral health care providers. Repeated unnatural, deviated or inadequate working postures, forceful hand movements, inadequate equipment or workplace designs and inappropriate work patterns are likely to be the particular risk factors. However, MSDs are not an avoidable part of the oral health care providers' professional lives. The high frequency of musculoskeletal disorders probably reflects the specific work load in dentistry, with high demands on vision and precision and fine manipulative hand movements and work with unsupported, elevated arms. The three possible routes to neck-shoulder muscular pain are mechanical failure, local ischemia and energy metabolism disturbance. The high frequency of symptoms from the neck, shoulders, and upper extremities of the dentists was probably related to their difficult work positions with cervical flexion and rotation, abducted arms, and repetitive precision-demanding handgrips.

Certain factors help the participants to relieve their pain which includes correct posture (46.9%), pause for few minutes (32.7%), muscle relaxing exercise (24.5%), analgesic drugs (10.2%), and complete rest for a day (4.1%), etc. Similar to this study, a study in Glasgow also found that improving or correcting posture can definitely help to relieve the pain.<sup>4</sup>

According to some studies, improvement in the ergonomics of the dental equipment has not served to reduce the incidence of musculoskeletal disorders.<sup>10</sup> The etiology of musculoskeletal disease is multifactorial, with the involvement of biomechanical, individual and psychosocial factors related to work. Consequently, the preventive strategy must be multifactorial and not only focused on ergonomics. Any useful study on musculoskeletal disorders among dentists should include an analysis of preventive strategies. These strategies in turn should focus on the following areas: ergonomics, breaks at work, general health and physical exercise.<sup>9</sup>

The use of indirect vision and correct patient positioning in the dental chair to avoid awkward or forced neck postures are also important. Proper lighting and the use of systems such as magnifiers and microscopes also help reduce fatigue and increase productivity.<sup>10</sup>

The Applied Occupational and Environmental Hygiene guidelines recommend at least 6 minutes of rest every hour for professionals who perform repetitive movements.<sup>9</sup> The three types of breaks which are recommended for dentists would be the following:

- Frequent stops and shaking exercises (relaxing of the arms, shaking and dropping them for periods of 15 seconds).
- Breaks between successive patients (dentists should perform movements opposite to those done during work, for 2-3 minutes).
- Breaks to allow recovery (periods of 10-15 minutes)

every 2-3 hours).

## CONCLUSION

A comprehensive approach to address the problem of Musculoskeletal disorders(MSD) in dentistry represents a paradigm shift in how operators work. New educational models that incorporate a multifactorial approach can be developed to help dental operators manage and prevent MSDs effectively.

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