



## Original Article

## Impact of Occupational Musculoskeletal Disorders on Dentists

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## ABSTRACT

Dentists are particularly vulnerable to ergonomically borne musculoskeletal diseases (MSDs), which decrease efficiency, productivity, and career longevity because to the exact and minute nature of their work. **Objective:** To determine different consequence of work related disorders among dentist of Lahore, Pakistan. **Methods:** In this cross-sectional survey 450 dentist of Lahore were approached and a structured proforma based survey was conducted using convenience sampling technique. In the study, dentists between the ages of 24 and 65 were included. Musculoskeletal Disorder has been presented in the form of frequency and percentage whereas age has been shown as mean and standard deviation. Chi square test has been applied to determine the association between musculoskeletal disorder and different study variables. P-value of 0.05 has been deemed significant. **Results:** In this study out of 450 dentists 236 (52.4%) were male and 214 (47.6%) were females. Mean age of the males were 37.08 ± 9.27 years and females were 33.43 ± 10.42 years. Among the subjects musculoskeletal disorders were reported by 393 (87.3%) dentist. Sick leave was availed by 278 (70.7%) whereas 373 (94.9%) seek medical treatment and 325 (82.7%) prevent daily activity. According to Dentist 388 (98.7%) believes that the disorder is caused by Dental Clinic i.e. Ergonomic issue. **Conclusions:** With two thirds of dentists taking sick time owing to musculoskeletal disorders, combined with the mental stress, it would appear that dentistry is not an easy profession. This would significantly limit the career of dentists.

## INTRODUCTION

Dental practice is a profession in which they are exposed to multiple risks including exposure to hazardous chemicals, infections, musculoskeletal disorders and stress related health issues. Among them Work-related musculoskeletal disorders are most common that also affects their general quality of life as well as clinical practice [1-3]. There are many contributing factors associated with musculoskeletal pain which includes longer clinical sessions, repetitive movement, ergonomic issues, higher BMI and history of trauma [4, 5]. Numerous unwelcome hazards for dental health care professionals result from

different working postures in dental job setting [2]. Dentists frequently operate in constrained spaces, and the majority of the time, their work is tedious and needs focus. In order to do their task, dentists may have to undergo discomfort, underscoring the high job demand associated with this occupation [3]. The higher prevalence of work-related Musculoskeletal disorders (MSDs) causes poorer productivity due to missed work deadlines, incapacity to carry out everyday tasks, and occasionally results in harm that ends a career [2, 3]. In different studies conducted in Pakistan back pain, neck pain and wrist/hand pain were

more frequent among dentist. Among Musculoskeletal pain in at least one body site ranges from 45 to 70% [6-8]. The number of patients treated daily, years in practice, working position, and breaks between patients were all found to be strongly correlated with back pain [9]. According to a recent study position while extracting tooth leads to musculoskeletal pain among 55.53% of the dentist [10]. It is evident in different study that the musculoskeletal disorder affects the physical and social wellbeing. These disorders also increase the trend of absenteeism and reduces the perform abilities of the dentist [11, 12]. The current study was conducted to determine different consequence of work related disorders among dentist of Lahore Pakistan.

## METHODS

In this cross-sectional survey 450 dentist of Lahore were approached and a structured proforma based survey was conducted using convenience sampling technique. The purpose of study was explained at the beginning of the proforma. Approval was granted by Ethical Review Board of Institute of Dentistry, CMH Lahore Medical College. After receiving ethical approval, survey monkey was used to design the structured questionnaire. In Pakistan, a study was done on dental professionals over the course of three months, from 15th June to 15th September, 2021. The research complied with STROBE recommendations for cross-sectional studies [13]. In the study, dentists between the ages of 24 and 65 were included. The study did not include dentists who had had their training abroad or who had any co-morbid disorders, such as malignancies or any bone illnesses, like muscular dystrophies or arthritis. The questions were all closed-ended. At the start of the questionnaire, the study's purpose was described. The questionnaire began with a definition of musculoskeletal pain and disorders to aid responders in understanding the term. Written consent was obtained. This questionnaire has been used in a number of previous studies, [2, 7] but five senior faculty members from different institutions have already confirmed the construct validity of the questionnaire. A pilot survey was completed by 20 dentists and dental students. It was discovered that the questionnaire has an internal reliability score of 0.865, or Cronbach's alpha value. SPSS version 23.0 was used to evaluate the questionnaire's responses. (Statistical package for social sciences, IBM, USA). Musculoskeletal Disorder has been presented in the form of frequency and percentage whereas age has been shown as mean and standard deviation. Chi square test has been applied to determine the association between musculoskeletal disorder and different study variables. P-values lower than 0.05 have been deemed significant

## RESULTS

In this study out of 450 dentists 236(52.4%) were males and 214(47.6%) were females. Mean age of the male was  $37.08 \pm 9.27$  years and female was  $33.43 \pm 10.42$  years. Among the subjects musculoskeletal disorders were reported by 393 (87.3%) dentist and among all factors, number of years practicing were showing more significant results (Table 1).

| Study variables                                     | Category                   | Frequency   |
|---|----------------------------|-------------|
| Intensity of Pain                                   | No Pain                    | 5 (1.3%)    |
|   | Mild Pain                  | 124 (31.6%) |
|   | Moderate Pain              | 122 (31.0%) |
|   | Severe Pain                | 142 (36.1%) |
| Frequency of Pain                                   | Never                      | 5 (1.3%)    |
|   | Rarely Occur               | 179 (45.5%) |
|   | Occasionally occurs        | 97 (24.7%)  |
|   | Often occur                | 96 (24.4%)  |
|   | Always occur               | 16 (4.1%)   |
| Factors of Musculoskeletal Disorders                | Work posture               | 96 (24.4%)  |
|   | Type of dental procedure   | 5 (1.3%)    |
|   | Number of practice hours   | 54 (13.7%)  |
|   | Number of years practicing | 208 (52.9%) |
|   | Overall health             | 30 (7.6%)   |
| MSDs few hours last 12months                        | Yes                        | 283 (72.0%) |
| MSDs daily minimal presence 1month for last12months | Yes                        | 106 (27.0%) |

**Table 1:** Frequency distribution of different sign and symptoms among dentist with musculoskeletal disorder.

Among 393 Dentist with musculoskeletal disorder Sick leave was availed by 278(70.7%) whereas 373 (94.9%) Seek Medical Treatment and 325 (82.7%) Prevent daily activity. According to Dentist 388 (98.7%) believes that the disorder is caused by Dental Clinic i.e. Ergonomic issue. Mean age of the dentist with musculoskeletal disorder were  $36.82 \pm 9.82$  years whereas without any disorder dentist's age was  $25.16 \pm 1.80$  and P-value was also considered as significant. (Table 2).

| Study variables | Category   | MSD         |           | P-value |
|-----------------|--|-------------|-----------|---------|
|                 |  | Yes         | No        |         |
| Gender          | Male   | 216 (91.5%) | 20(8.5%)  | 0.005*  |
|                 | Female   | 177 (82.7%) | 37(17.3%) |         |
| Designation     | House officers/PG                                      | 30 (53.6%)  | 26(46.4%) | <0.001* |
|                 | Demonstrator/Lecturer/Registrar                        | 47(100.0%)  | 0(0%)     |         |
|                 | Senior Lecturer/Senior Registrar                       | 106(100.0%) | 0(0%)     |         |
|                 | Senior Faculty (Assist Prof., Assoc. Prof., Professor) | 164(100.0%) | 0(0%)     |         |
|                 | Private Practitioner                                   | 46(59.7%)   | 31(40.3%) |         |
| Working Hours   | 11-20 hours  | 40(88.9%)   | 5(11.1%)  | 0.040*  |
|                 | 21-30 hours  | 115(83.9%)  | 22(16.1%) |         |
|                 | 31-40 hours  | 192(86.5%)  | 30(13.5%) |         |
|                 | >41 hours  | 46(100.0%)  | 0(0.0%)   |         |

**Table 2:** Comparison of musculoskeletal disorder according to

demographic factors

\*Significant Association using Chi square test

## DISCUSSION

In the previous 12 months, around 70% of the participating dentists reported one or more occurrences of musculoskeletal illnesses. Lower back discomfort was the most common complaint (65%), then neck pain (53.3%), and wrist/hand pain (37.5%). The average number of hours worked per week and musculoskeletal diseases were found to be positively ( $P < 0.05$ ) [7] and in the current study, lower back pain was also most common complaint (60%), then neck pain (55%). The biomechanics of sitting working postures and physiological damage or pain were the subject of some studies. While some studies looked at the negative consequences of working in one position for extended periods of time, other studies revealed that repetitive unidirectional twisting of the trunk can cause low back pain. Additional research has shown the importance of operators being aware of how to correctly adjust ergonomic equipment and the roles that flexibility and core strength may play in maintaining balanced musculoskeletal health [11, 12, 14] but the current study focused on various factors responsible for musculoskeletal disorders and current study suggested that musculoskeletal disorders are very common among dentists. 89% of the students exhibited low to moderate postural awareness, according to the evaluation of their postural awareness. According to the correlation between postural awareness and the prevalence of MSDs, 40% of students who have good awareness, 49% of students who have moderate awareness, and 75% of students with low awareness have MSDs. The findings, which were statistically significant (0.002127, or 0.005), indicated that a greater awareness of correct working postures reduces the risk of MSDs. Postural awareness scores for the students revealed that 21% had low awareness, 67% had moderate awareness, and 11% had good awareness. The analysis of the data revealed that MSD prevalence was considerably higher among students with low-to-average postural awareness. The consensus is to alternate between long, challenging cases and short, straightforward cases when scheduling patients, and to use a surgical magnification device as needed. It ought to permit a relaxed posture while preserving a clear perspective of the job at hand. Make the necessary lifestyle adjustments for a successful dental practice [14, 15]. From our research it is apparent that although there is room for improvement, the theoretical information on ergonomic neutral positions taught throughout dentistry undergraduate training can be deemed borderline adequate. The lack of emphasis on ergonomics during clinical training, however, is responsible for the result that

having sufficient knowledge about ergonomic behaviors does not guarantee the adoption of ergonomically safe practices at the chairside. With a p-value of 0.67 and a Pearson's coefficient of +0.299, the results show that there is no relationship between knowledge and practices [15-17]. Qualitative findings show that having theoretical understanding may not always convert into practical practice. When acquiring new clinical skills, students focus more on getting the dental procedures right than they do on maintaining good posture. Additionally, they fail to notice when their seniors, who ought to serve as role models, do not use proper ergonomic procedures. In conclusion, dental students are only briefly introduced to ergonomics during pre-clinical training and receive minimal more instruction during their clinical rotations. For both pre-clinical and clinical rotations, focus on ergonomic work postures and behaviors needs to be raised during undergraduate training. It is essential that interns and junior teaching faculty regularly attend refresher awareness courses [16, 18-20]. In the current study, before entering the dentistry profession, the majority of the dentists in the current study were questioned about their physical condition and any severe musculoskeletal issues. Campaigns could be launched to spread awareness with the help of physiotherapists, chiropractors, and dental curriculum, emphasising how to work in an ergonomic manner, which would involve taking frequent breaks, avoiding stiff postures for extended periods of time, using magnification to prevent bending the neck, concentrating on strengthening the body's muscles through weight training and exercise, and occasionally using nerve flosses to prevent nerve irritation. CPD programmes can also be made available to lessen the physical demands of the job.

## CONCLUSIONS

It can be concluded that in the present study many dentists reported musculoskeletal disorders and had an impact on their career and daily routine life. With two thirds of dentists taking sick time owing to musculoskeletal disorders, combined with the mental stress, it would appear that dentistry is not an easy profession. This would significantly limit the career of dentists. Work ergonomics must be emphasized in the curriculum at the university level, and CPD courses on how to improve workplace ergonomics must be offered.

## Conflicts of Interest

The authors declare no conflict of interest

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