



Musculoskeletal System Disorders among Dentists

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Abstract

Objectives: This study aimed to examine the frequency of musculoskeletal system disorders among dentists.

Materials and Methods: Total of 145 dentists actively practicing dentistry in Diyarbakir or neighboring provinces were given a questionnaire on their musculoskeletal system symptoms and working habits.

Results: Findings showed that upper back pain (25.5%) or upper and lower back pain combined with neck pain (25.5%) were the most common type of complaints. However, gender, working position or help of an assistant did not have any significant effect on the frequency of symptoms.

Conclusion: Within the limitations of this study, we suggest that dentists are suffering from a significant degree of musculoskeletal system disorders. To prevent occupational musculoskeletal complaints, dentists should minimize static muscular activity and increase variation in their working posture.

Keywords: Dentistry; Musculoskeletal diseases; Occupational disease

Introduction

Meticulous work requiring both mental and physical effort is essential in dentistry. One of the challenging aspects of working within the mouth is the difficulty in providing a satisfactory view. Physical and psychological causes including incorrect working postures to obtain an unobstructed view, repeated and/or effortful movements, exposure to vibration, time pressure, reflection of patient anxiety, and concerns of malpractice all contribute to the increased incidence of musculoskeletal problems [1,2].

Previous studies from various countries examining the occupational health issues for dentists reported significantly higher rates of musculoskeletal problems in this profession [3-6]. Al Wazzan et al. [7] reported problems related to the back in 79% of dentists, with 34% of dentists experiencing job loss due to this problem. Back pain between cervical and lumbar vertebral levels has been reported as the most frequent musculoskeletal disorder. In general, the shape of the vertebral column, aging, muscular weakness, sitting pattern, exercising, and technique for weight lifting have been known to play role in the development of musculoskeletal disorders. This study aimed to investigate the frequency of musculoskeletal complaints among dentists registered to the Diyarbakir Chamber of Dentists and actively practicing dentistry.

Materials and Methods

This study was conducted with 145 dentists (age range: 23-61 years; 103 male, 42 female) actively practicing dentistry in Diyarbakir or neighboring provinces who were registered to the Diyarbakir Chamber of Dentists at the time of last chamber elections. At least one year of active work was required to be eligible for this questionnaire study. A questionnaire including questions on the musculoskeletal problems of the dentists was prepared and completed through face-to-face interview. The first part of the questionnaire was for the collection of personal data (age, gender, etc.). The second part included specific questions on neck and back pain and the final part questioned the working positions of the subjects. The whole questionnaire consisted of multiple-choice questions. After the completion of the questionnaire, responses were discussed with the

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Table 1: Data on demographics, working position, exercising frequency and impact of neck/back pain on practice.

Characteristic	All subjects(n=145)	Males(n=103)	Females(n=42)
Age, y (mean ± SD)			
Duration of practice, y (mean± SD)			
Working position			
Sitting position	24 (16.6%)	20 (19.4%)	4 (9.5%)
Standing position	44 (30.3%)	36 (35.0%)	8 (19.0%)
Both sitting and standing position	77 (53.1%)	47 (45.65)	30 (71.4%)
Interruption of patient treatment due to neck/back pain			
Never	109 (75.2%)	82 (79.6%)	27 (64.3%)
Rarely	23 (15.8%)	14 (13.6%)	9 (21.4%)
Occasionally	13 (9.0%)	7 (6.8%)	6 (14.3%)
Exercising frequency			
Never	26 (17.9%)	15 (14.6%)	11 (26.2%)
Rarely	58 (40.0%)	42 (40.8%)	16 (38.1%)
Occasionally	53 (36.6%)	38 (36.9%)	15 (35.7%)
Frequently	8 (5.5%)	8 (7.7%)	0 (0%)

Unless otherwise stated, data are presented as n (%).

subjects. Data were analyzed using “SPSS for 6.0 Windows” software package. Chi-square test was used for the comparison of categorical variables and continuous variables were compared using student t test for independent samples. A p value <0.05 was considered significant.

Results

Demographical and occupational data

The mean age and mean duration of occupational experience was 35.0 ± 9.0 years and 10.7 ± 8.2 years, respectively. Females were significantly younger than males (29.6 ± 5.3 years vs. 37.2 ± 9.3 years, $p < 0.001$). Likewise, mean duration of occupational experience was shorter among females (6.9 ± 5.4 years vs. 12.3 ± 8.7 years, $p < 0.001$). Most subjects were rarely (40.0%) or occasionally (36.6%) exercising. Less than half of the subjects (43.4%) reported 8 to 10 hours of active daily work. Table 1 provides data on demographics, working position, exercising frequency and impact of neck/back pain on practice.

Frequency and impact of musculoskeletal complaints

Musculoskeletal pain was quite common among dentists with a prevalence of 88.3% and 17.2% of dentists had sought medical help for musculoskeletal complaints. Among the categories of upper back, neck, shoulder, hand and wrist, upper and lower back pain with neck pain, and head and facial pain, upper back pain (25.5%) and upper and lower back pain combined with neck pain were the most frequent (Figure 1). Males and females had similar rates of musculoskeletal complaints. On the other hand, 75.2% of the subjects had never experienced musculoskeletal symptoms necessitating the interruption of the patient treatment.

Sixty-one percent of dentists reported that they have an assistant while working; however, there was no statistical relation between getting help from an assistant and the frequency of musculoskeletal complaints. Majority of the dentists reported that they use both sitting and standing position when working (53.1%), whereas 16.6% and 30.3% were working in either sitting or standing position alone, respectively. A detailed distribution of the individual categories of complaints by working position is given in Figure 2. Male dentists however, have a tendency to use either position (i.e. sitting or standing alone) whereas females tended to use both positions during their

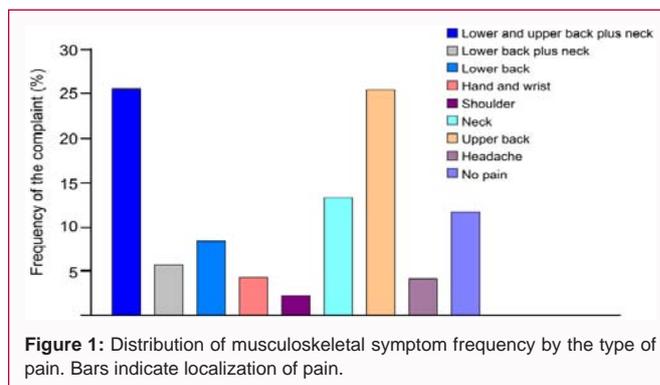


Figure 1: Distribution of musculoskeletal symptom frequency by the type of pain. Bars indicate localization of pain.

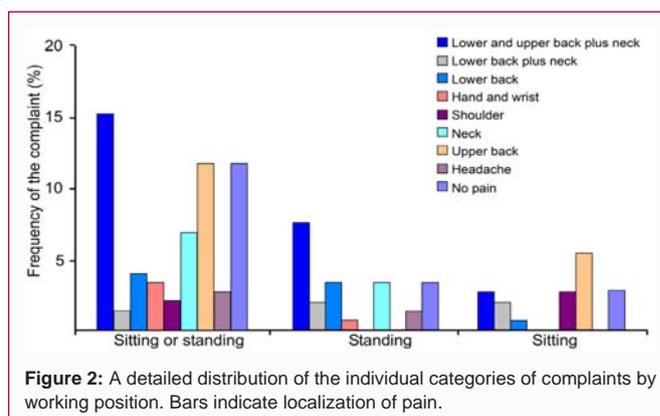


Figure 2: A detailed distribution of the individual categories of complaints by working position. Bars indicate localization of pain.

practice. Nevertheless, working position did not have any significant effect on the frequency of musculoskeletal complaints.

Discussion

Most studies investigating occupational diseases among dentists have used questionnaire forms sent and collected by surface mail. In this study however, questionnaire forms were completed via face-to-face interviews with dentists.

This study found that musculoskeletal complaints are common among dentists. Within the last year, 88.3% of all dentists had

experienced musculoskeletal pain. According to the findings of Kerosuo et al. [5] 70% of dentists experience musculoskeletal pain during their practice and the corresponding figure was 78% in the study by Chowanadisai et al. [4]. Lehto et al. [3] reported a 42% rate of activity-restricting musculoskeletal pain during the last year among dentists. According to most investigators, musculoskeletal complaints are common in the general population but they are even more common among dentists [8-10]. Continuous working in the same position is characteristic for dentists, commonly resulting in musculoskeletal complaints [11,12]. In this study, no significant difference was found between male and female dentists with regard to the frequency of musculoskeletal pain ($p>0.05$). Chowanadisai et al. [4] did not also find any significant difference between the two sexes with corresponding rates of 77% and 61% among female and male dentists, respectively. On the other hand, Kerosuo et al. [5] found significantly higher rate of musculoskeletal complaints among female dentists.

For the purpose of this study, musculoskeletal pain was categorized as involving upper back, neck, shoulder, hand and wrist, lower back, lower back plus neck, back and neck, and facial pain plus headache. Based on this classification, lower back pain (25.5%) and lower and upper back with neck pain (25.5%) were most frequent among dentists. Chowanadisai et al. [4], Lehto et al. [3], and Marshall et al. [6] found that back pain was the most common complaint among dentists, whereas shoulder pain was the most common complaint according to the results of Kerosuo et al. [5]. This study examined a possible relation between working position and musculoskeletal pain but failed to find a statistically significant difference with regard to the frequency of musculoskeletal pain among dentists that have adopted different working positions. However, Lehto et al. [3] and Marshall et al. [6] found that most of the dentists experiencing musculoskeletal pain were working in sitting position. In a study on neck and low back pain among dentists, incorrect sitting positions and stress were identified as important factors as the prolonged duration of work in the mouth to achieve a successful treatment, in the development of these complaints. According to many studies, inappropriate movements like extreme bending, continuous tilting of the neck, extreme stretching the body, continuous raising of the working arm all result in malposition of vertebral column. Akesson et al. [13] conducted a study on 268 dentists and found high rates of neck and shoulder symptoms during a period of 12 months, both in males and females. Authors suggested that bending to provide an unobstructed view, efforts to accomplish a careful work, and prolonged work using an unsupported arm were the most possible causes of these symptoms. When the results of studies on musculoskeletal problems are examined, there is a similarity between current and earlier studies. The frequency of musculoskeletal problems have not decreased during the last 15 years, despite better ergonomic features of dental appliances, adoption of 4-hand technique in sitting position involving the coordinated work of the dentist and assistant, and more exercising. According to Bassett, incorrect postures and extreme muscular stretching account for this lack of improvement over the years [14]. Training on correct positions and techniques eliminating muscular stretch during dental education would prevent these problems in the

future. Szymańska [12] suggested that 4-hand method should be used to minimize musculoskeletal problems since it reduces the working time and allows for the relaxation of back, lower back, and lower extremity muscles.

Conclusions

Pathological conditions involving musculoskeletal system are important occupational problems for dentists. Training, investigations on new technologies and treatment modalities aimed at the prevention and management of these pathological conditions are of utmost importance in terms of professional success, quality, and their maintenance. In order to prevent risk factors for occupational musculoskeletal problems, dentists should minimize static muscular activity and increase variation in their working posture.

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