Original Article

Prevalence of musculoskeletal disorder among dental practitioners

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Abstract

Introduction: Literature reviews world over have shown a high prevalence of musculoskeletal disorders (MSDs) among dental practitioners. Prevalence of MSD among dental practitioners in India, particularly in Karnataka, is not well documented. **Aim:** To determine the prevalence and distribution of MSD among dental practitioners and its correlation with working ability in South Canara district of Karnataka, India. **Materials and Methods:** A self-administered questionnaire was used to assess the musculoskeletal symptoms among dental practitioners. The recorded data was analyzed using Chi-square test with Statistical Package for the Social Sciences (SPSS 17). $P < 0.05$ was considered statistically significant. **Results:** Forty-nine dental practitioners participated in the study, of which 93.87% had a prevalence of at least one musculoskeletal symptom over the past 12 months. Most common areas affected by MSD in order of magnitude were back (67.34%), neck (59.18%), hand (34.69%), shoulder (32.65%), wrist (30.61%), hip/thigh (20.40%), ankle (18.36%), and knee (16.32%). Also, 39.13% practitioners attributed MSDs to cause limitations at work. **Conclusions:** High prevalence of MSD exists among our dental practitioners affecting the daily practice of more than one-third of them. Further studies are needed to identify the specific risk factors for MSD so as to introduce effective remedial measures.

Key words: Dentist, musculoskeletal disorder, muscular pain

INTRODUCTION

Musculoskeletal disorders (MSDs) have become increasingly common worldwide during the past decades. Work-related MSDs are of serious concern to many organizations, including industry, insurance, and healthcare.[1] MSDs including pain, weakness, and paresthesia are reported to be associated with a wide range of occupations.[2,3] These problems are caused by repetitive, awkward, or stressful motions.[4] Among the healthcare professionals, dentists are at high risk for developing profession-related disorders such as MSDs.[5] In dentists, common MSD are overstrained and awkward back postures for back pain, repetitiveness for neck and shoulder disorders, and psychosocial stressors for back, neck, and shoulder complaints.[6] Dental practice is characterized by high visual demands, which result in adoption of fixed postures.[7] 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 for MSDs among dental professionals. Occasional pains from irregular stances or positions are to be expected, while they are performing static work. However, when the pain becomes a regular occurrence, cumulative damage could arise, leading to debilitating injuries.

The possible pathophysiological mechanism of occupational stress on the neck and shoulders has been reviewed by Hagberg.[8] Several studies have indicated that back, neck, and shoulder pain are a major problem among dentists. Six studies, in particular, polled respondents over a period of 1-5 years and found that over half of the participating dentists experienced musculoskeletal pain: Shugars

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Quick Response Code:

Website: www.msd.ancientscienceoflife.org

DOI: 10.4103/0000-1112.111951

et al., (1987) reported 60%, under antz *et al.*, (1990) cited 72%, Auguston and Morken (1996) reported 81%, Finsen *et al.*, (1997) reported 65%, and Chowanadisai *et al.*, (2000) reported 78%.

Prevalence of MSD has not been well documented in India.[9] Despite these facts, there are not many investigations done so far to find the prevalence of MSDs among practising dentist in India. This study was conducted in South Canara district of Karnataka with the aim to find out the prevalence of MSDs among dentists and its correlation with interference at work.

MATERIALS AND METHODS

A cross-sectional study was carried out on dentists who worked in private and/or public dental offices. Subjects in overall good general health were selected randomly from different cities of South Canara district.

Questionnaire and data collection

Questionnaire consisted of two sections in each part of which crucial points on MSDs were drawn. The first part was a self-administered questionnaire about the respondents' demographic information including age, sex, years in dental profession, average working hours per day, and field of dental practice.

In the second part, musculoskeletal complaints were recognized by the Nordic Musculoskeletal Questionnaire suitable for application in work places and for a large number of workers very quickly and cheaply. This questionnaire included nine body areas including neck, shoulders, back, elbows, wrist/hands, thighs, knees, and ankles. Musculoskeletal complaints were defined as pain perceived in the last 12 months experienced as ache and discomfort and its interference with work. Data obtained was analysed by Chi-square test using the Statistical Package for the Social Sciences (SPSS 17).

RESULTS

Survey forms having questionnaires [Table 1] were distributed to 60 dental practitioners, of which 49 responded and were analysed. Among the 49 dentists, 25 (51.02%) were males and 24 (48.97%) female, with a mean age of 36.43 years. Majority (63.26%) were general dental practitioner, with the remainder were specialists [Figures 1 and 2].

Most of the dentists (93.87%) reported having at least one MSD symptom in the past 12 months. More than half (58.33%) of the female practitioners reported having only one to two MSD symptoms with lesser number of females reporting three or more MSD symptoms as compared to male practitioners. However, only 39.13% dentist attributed MSDs to limitation at work, of which 31.81% were female and nearly half (45.83%) were male. The most prevalent MSD during the past 12 months reported were back (67.34%) and neck (59.18%),

Table 1: Questionnaire used in the study

Name:			Age:	
Gender:			Address:	
Height/weight (BMI):			Phone:	
Years in dental profession:			E-mail:	
Average working hours per day:			Field of dental practice:	
Have you at any time during the last 12 months had symptoms (pain and/or discomfort)			**At any time during the last 12 months had pain and/or discomfort that interfered with work**	
Neck	Yes	No	Yes	No
Back	Yes	No	Yes	No
Shoulder	Yes	No	Yes	No
Elbow	Yes	No	Yes	No
Wrist	Yes	No	Yes	No
Hand	Yes	No	Yes	No
Hip/thigh	Yes	No	Yes	No
Knee	Yes	No	Yes	No
Ankle/foot	Yes	No	Yes	No

BMI: Body mass index

followed by hand (34.69%), shoulder (32.65%), wrist (30.61%), hip/thigh (20.40%), ankle (18.36%), and knee (16.32%), respectively [Figure 3]. The number of years of practice plays an important role in the occurrence of MSDs, although both younger and older dentists reported the same symptoms. Our findings suggest that pain in the hip, feet, shoulders, and elbows is reported significantly more often after 15 years of practice. However, there was no gender predilection for specific body site affected by MSD.

DISCUSSION

This study examined the prevalence and distribution of self-reported MSD among a cross-section of dentists in South Canara district. The dentists were asked to note the occurrence of pain and discomfort over the past 12 months. The 12-month period prevalence of back pain among dentists in South Canara district was 67.34%, which is more than that reported in many other countries such as Denmark (50%),[10] Israel (55%),[11] and the United States (53%).[12] Although, it was similar to an Australian study from New South Wales (NSW; 64%).[13] The 12-month period prevalence of neck-related pain among dentists in South Canara district (59.18%) was lower than that reported by dentists in many other countries, such as Denmark (65%)[10]and Saudi Arabia (65%),[14] but higher than a survey of Israeli dentists (38.3%).[11] Akesson *et al.*,[15] assumed that the work posture plays an important role as a risk factor for the development of work-related disorders. A high frequency of MSDs among dentists was confirmed in numerous subsequent studies.[16-18] As it is commonly known, maintaining poor posture for long periods of time can result in chronic muscular fatigue, discomfort or pain, even if the soft tissues are not structurally altered. More significantly, prolonged exposure to high static muscle and joint load may lead the soft tissues to adaptively change, and, with time, it may lead to pathological effects and permanent disability.[17,19,20] Finsen *et al.*,[10] presumed that an increased variation in work postures may reduce the risk of overloaded spine and lower and upper limbs. Newell and Kumar[16] confirmed that, in recent years, attention and awareness of MSDs in the dental profession has noticeably increased due to rise in the number of reported MSDs.

Karwaski *et al.*,[21] reported that the symptoms are a product of many risk factors including prolonged

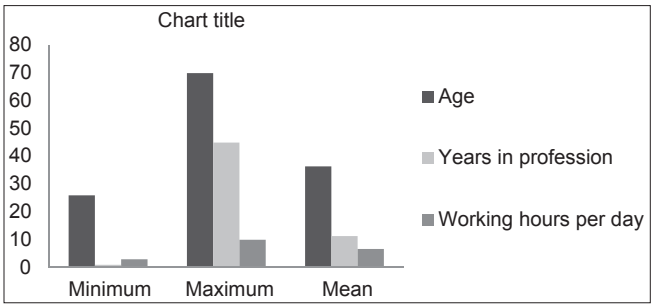

Figure 1: Participants by age, years in profession and working hours

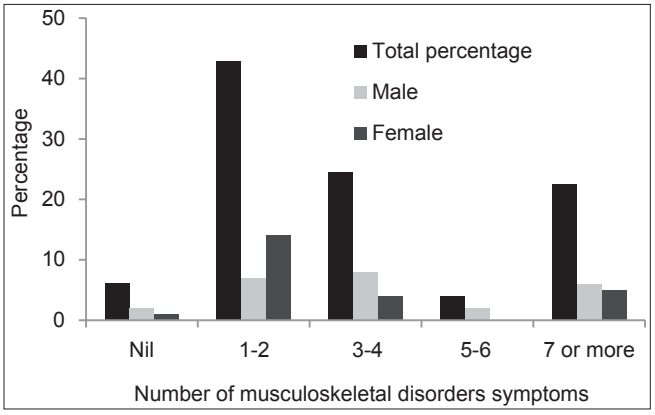

Figure 2: Number of musculoskeletal disorders symptoms

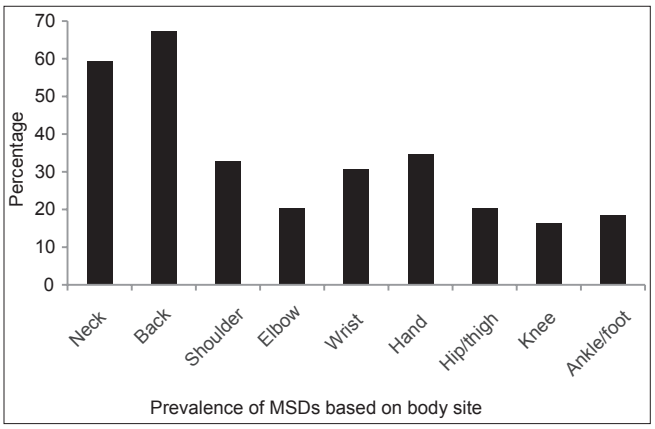

Figure 3: Prevalence of MSDs based on body site

static postures, repetitive movements, and poor positioning. Ratzen,[11] on the other hand, linked musculoskeletal pain occurrence in the dentists to the frequent assumption of static postures, which usually requires >50% 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 tasking than dynamic forces. Repeated prolonged static postures are thought to initiate a series of events that could account for pain, injuries, or career-ending problems seen in MSDs.

CONCLUSION

A thorough understanding of the underlying physiological mechanisms, leading to MSD problems is necessary to develop and implement a comprehensive approach to minimize the risks of a work-related injury. The prevention and reduction of MSDs among dentists should include their education in dental ergonomics and awareness regarding the importance of work-related risk factors.

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How to cite this article: Dayakar MM, Gupta S, Philip G, Pai P. Prevalence of musculoskeletal disorder among dental practitioners. ASL Muscuskel Dis 2013;1:22-5.

Source of Support: Nil, **Conflict of Interest:** None declared.