

## Original Research

### Determination of work- related musculoskeletal disorders among dentists

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#### ABSTRACT:

**Background:** Occupational hazards are common in various populations. Musculoskeletal disorders (MSDs) are a significant occupational health hazard that affect members of various occupations. The present study was conducted to assess work related musculoskeletal disorders among dentists. **Materials & Methods:** 210 dental surgeons of both genders were enrolled. Frequency of pain, stiffness and intensity of pain was recorded through a questionnaire. **Results:** Out of 210, males were 110 and females were 100. Most of the dentists had always pain observed in elbow in 40%, shoulder in 35%, neck in 70%, back in 65%, knee in 20%, hip in 80% and ankle in 55%. Intensity of pain was severe in most of the subjects. Stiffness was present sometimes in most of the dentists. **Conclusion:** Most of the dental surgeons had musculoskeletal disorder and most of had pain in neck, back, hip and shoulder.

**Key words:** Pain, stiffness, Musculoskeletal disorders

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#### INTRODUCTION

Occupational hazards are common in various populations. Musculoskeletal disorders (MSDs) are a significant occupational health hazard that affect members of various occupations. MSDs are defined as a group of disorders that affect various regions of the musculoskeletal system.<sup>1</sup> These areas include the nerves, tendons, muscles, joints and supporting structures such as intervertebral discs. Patients with MSDs may exhibit any of the following symptoms/complaints: pain, paresthesia, stiffness, swelling, redness and/or weakness.<sup>2</sup>

Dentists are among the workers who are more often susceptible to MSDs; their work includes risk factors that may lead to many pathologies such as tendinitis, synovitis, tenosynovitis, and bursitis. Occupational diseases have not only physical, psychological, and social consequences, but also economic and security impacts when they reach a level of severity that directly affects work capacity, causing absences and early retirement.<sup>3</sup>

Work in dentistry is characterized by some body postures with different degrees of distortion. There are many types of factors responsible for MSD: occupational factors, medical factors (physical disorders, genetic predisposition, and age) and life style factors. Usually two or more factors trigger MSD.<sup>4</sup> Occupational factors include prolonged static postures, repetitive movements, inadequate lighting, the excessive exertion of the small muscles, and the instrument tight grip, raised arms, static exertion of the muscles on long term, fine-tuned actions and vibration.<sup>5</sup> According to WHO there are over 59 million workers on healthcare facilities who are exposed to a wide range of occupational hazards in result the incidence of work-related injuries and diseases is high in this group.<sup>5</sup> These diseases lead to physical, emotional, economical and social consequences on healthcare workers and their families. Studies show that wide variety of workplace hazards such as infections, eye injuries, vibration, percutaneous exposure incidents, exposure to radiation, dental materials, noise, psychological

conditions and musculoskeletal disorders exists in dental practice.<sup>6</sup> The present study was conducted to assess work related musculoskeletal disorders among dentists.

**MATERIALS & METHODS**

The present study comprised of 210 dental surgeons of both genders. All gave their written consent to participate in the study.

Demographic data of all dental practitioners were recorded. A questionnaire was prepared such as age, gender, field of dental practice, years in profession, average working hours per day, average workdays per week, average patients treated per day, height and weight. Frequency of pain, stiffness and intensity of pain was also recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

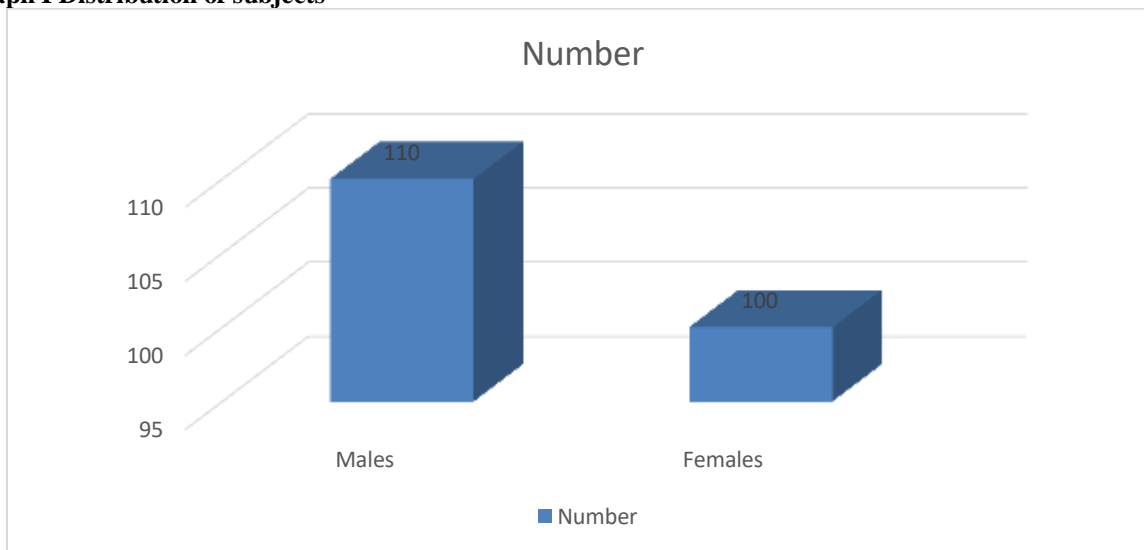
**RESULTS**

**Table I Distribution of subjects**

Total- 210		
Gender	Males	Females
Number	110	100

Table I shows that out of 210, males were 110 and females were 100.

**Graph I Distribution of subjects**

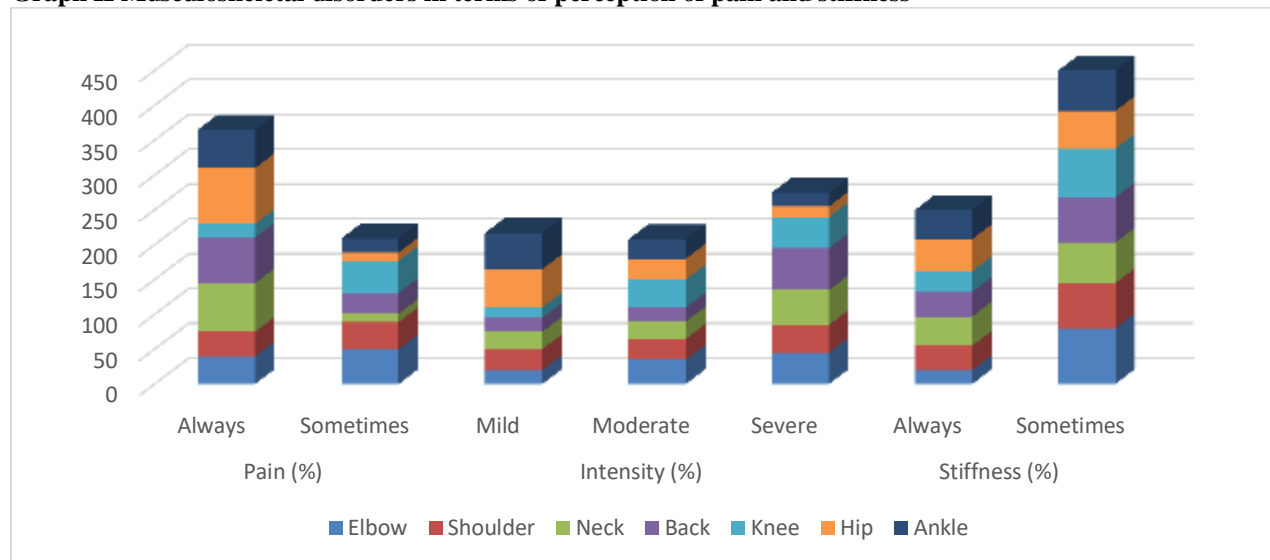


**Table II Musculoskeletal disorders in terms of perception of pain and stiffness**

Location	Pain (%)		Intensity (%)			Stiffness (%)	
	Always	Sometimes	Mild	Moderate	Severe	Always	Sometimes
Elbow	40	50	20	35	45	20	80
Shoulder	35	39	30	30	40	35	65
Neck	70	12	25	25	50	42	58
Back	65	30	20	20	60	35	65
Knee	20	46	15	40	45	30	70
Hip	80	12	55	30	15	46	54
Ankle	55	20	52	28	20	42	58

Table II, graph II shows that most of the dentists had always pain observed in elbow in 40%, shoulder in 35%, neck in 70%, back in 65%, knee in 20%, hip in 80% and ankle in 55%. Intensity of pain was severe in most of the subjects. Stiffness was present sometimes in most of the dentists.

**Graph II Musculoskeletal disorders in terms of perception of pain and stiffness**



## DISCUSSION

MSDs may be caused by an interplay of specific risk factors acting during work related activities, such as: repetitive motions, awkward or static postures, forceful movements, and exposure to vibration and/or mechanical stress. When these factors exist simultaneously, the risk of developing MSD increases significantly.<sup>7</sup> Although some musculoskeletal injuries occur at one specific moment, many more result from repeated strength demands coupled with lack of significant rest periods. Upon exceeding the tissue tolerance of an individual, these injuries further impair the body's ability to heal itself from the long-term adverse effects of work-related activities.<sup>8</sup> Dentists are at risk of developing MSDs. The use of vibratory tools, excessive repetitive movements, maintaining a static position while performing extremely precise procedures in a small workspace, and/or maintaining an inadequate posture for long periods of time are some of the postulated reasons for the possible risk of developing MSD.<sup>9</sup>

Work-related musculoskeletal disorders (WMSDs) are conditions in which the work environment and performance of work contribute significantly to the condition; and/or the condition is made worse or persists longer due to work conditions. These areas are especially susceptible to the development of trigger points, which are groups of muscle fibers that are in a constant state of contraction inside a tight band of muscle.<sup>10</sup> The present study was conducted to assess work related musculoskeletal disorders among dentists. In present study, out of 210, males were 110 and females were 100. Aljnakh et al<sup>11</sup> in their cross-sectional, questionnaire study among 80 licensed dentists used a self-administered questionnaire, based on the Nordic Musculoskeletal Questionnaire (NMQ)

was sent to participants after translation to Arabic. The questionnaire was delivered by mail with a prepaid return envelope. Sixty-eight questionnaires (85%) were returned. The prevalence of MSDs among respondents was 77.9% (n=53) with the most commonly affected areas the lower back (73.5%) (39/53) followed by the neck (66%) (35/53) and the shoulders (43.3%) (23/53). Twenty-four (45.2%) of 53 respondents had experienced MSDs in the neck and lower back at the same time throughout the past twelve months. Nearly 85% (45/53) of respondents were found to have MSDs affecting two or more sites.

We found that most of the dentists had always pain observed in elbow in 40%, shoulder in 35%, neck in 70%, back in 65%, knee in 20%, hip in 80% and ankle in 55%. Intensity of pain was severe in most of the subjects. Stiffness was present sometimes in most of the dentists. Shaik et al<sup>12</sup> identified the musculoskeletal disorders in terms of perception of pain and stiffness experienced by the dental surgeons due to the rigors of dental work, to determine the prevailing working environment with particular reference to dental work station in relation to musculoskeletal disorders. The study showed that 6.6% dental surgeons always experienced shoulder pain, while 83.3% dental surgeons sometimes experienced back pain and 70% sometimes experienced neck pain. Majority of the dental surgeons (73.3%) experienced stiffness in the back and 23.3% experienced severe pain in their neck. It was observed that the number of patients attended per day by the dental surgeons had a significant association ( $P = 0.024$ ) with the pain they experienced in their hip/thigh region. The frequency of pain experienced by the dental surgeons in the hip/thigh and knee joints also showed a significant association with the height of the dental surgeons.

Shams-Hosseini et al<sup>13</sup> in their study on MSDs found that the prevalence was between 0.5% and 70%. The prevalence of pain in different regions includes; neck pain (0.7- 0.15), back pain (0.08 - 0.55), wrist pain (0.005-0.48), shoulder pain (0.08-0.5), knee pain (0.03-0.25) and elbow pain (0.01- 0.2). The gender has no influence on the prevalence. Compare the results with other similar studies shows that the prevalence of MSD is an important issue in other area too. According to the systematic review of MSDs among dental professionals, in overall terms, the prevalence of lower extremity musculoskeletal pain is often less than 20%, which is considerably lower than the prevalence of upper extremity pain. Accordingly, the prevalence of MSDs related to areas of the lower extremity such as hips/thighs, knees and ankle/feet in this study was found to be in the range of 9.4% to 13.2%.<sup>14</sup> The shortcoming of the study is small sample size.

### CONCLUSION

Authors found that most of the dental surgeons had musculoskeletal disorder and most of had pain in neck, back, hip and shoulder.

### REFERENCES

1. Botha P, Chikte U, Esterhuizen T. Self-reported musculoskeletal pain among dentists in South Africa: A 12-month prevalence study. *SADJ*. 2014; 69(5):208-13.
2. Lindfors P, von Thiele U, Lundberg U. Work characteristics and upper extremity disorders in female dental health workers. *J Occup Health*. 2006; 48:192-197.
3. Anghel M, Argesanu V, Talpos-Niculescu C, Lungeanu D. Musculoskeletal disorders (MSDs)-consequences of prolonged static postures. *Journal of Experimental Medical & Surgical Research*. 2007; 4:167-72.
4. Barghout NH, Al-Habashneh R, Al-Omiri MK. Risk factors and prevalence of musculoskeletal disorders among Jordanian dentists. *Jordan Med J*. 2011; 45(2):195-204.
5. Bains SK, Bhatia A, Singh HP, Yadav M. Temporomandibular disorders: Behavioural assessment ASL- Musculoskeletal Dis 2013; 1(1): 26-29.
6. Lalumandier J, McPhee S, Parrott CM, Vendemia. Musculoskeletal pain: Prevalence, prevention, and differences among dental office personnel. *Gen Dent*. 2001; 49(2):160-6.
7. Lake J. Musculoskeletal dysfunction associated with the practice of dentistry – proposed mechanisms and management: literature review. *Univ Tor Dent J*. 1995; 9:7-11.
8. Morse TF, Michalak-Turcotte C, Atwood-Sanders M, Warren N, Peterson DR, Bruneau H et al. A pilot study of hand and arm musculoskeletal disorders in dental hygiene students. *J Dent Hyg*. 2003; 77:173-9.
9. Lake J. Musculoskeletal dysfunction associated with the practice of dentistry – proposed mechanisms and management: literature review. *Univ Tor Dent J*. 1995; 9:7-11.
10. Morse TF, Michalak-Turcotte C, Atwood-Sanders M, Warren N, Peterson DR, Bruneau H et al. A pilot study of hand and arm musculoskeletal disorders in dental hygiene students. *J Dent Hyg*. 2003; 77:173-9.
11. Aljanakh M, Shaikh S, Siddiqui AA, Al-Mansour M, Hassan SS. Prevalence of musculoskeletal disorders among dentists in the Ha'il Region of Saudi Arabia. *Annals of Saudi medicine*. 2015 Nov;35(6):456-61.
12. Shaik AR, Rao SB, Husain A, D'sa J. Work-related musculoskeletal disorders among dental surgeons: A pilot study. *Contemporary clinical dentistry*. 2011 Oct;2(4):308.
13. Shams-Hosseini NS, Vahdati T, Mohammadzadeh Z, Yeganeh A, Davoodi S. Prevalence of musculoskeletal disorders among dentists in Iran: A systematic review. *Materia socio-medica*. 2017 Dec;29(4):257.
14. Hayes MJ, Smith DR, Taylor JA. Musculoskeletal disorders and symptom severity among Australian dental hygienists. *BMC Research Notes*. 2013; 6(1):250.