# Risk Factors and Prevalence of Musculoskeletal Disorders among Jordanian Dentists

*Nicola H. Barghout,*[1] Rola Al-Habashneh,[2] Mahmoud K. AL-Omiri[3]*

**Abstract**

**Aims of the study:** To investigate the prevalence of Musculoskeletal Disorders (MSDs) symptoms (hand/wrist, neck, shoulder and back pain) among dentists and to identify the risk factors associated with these symptoms.

**Methods:** A random sample of 200 dentists (114 males (mean age 40.6 years) and 86 females (mean age 40.1 years) were personally interviewed using a structured questionnaire. The questionnaire assessed age, gender, presence of MSDs, daily working hours, years of experience, working position, participants' knowledge of correct working posture and employment of dental surgeon assistant. Data were processed and analyzed by Chi-square test. P value was set at $\leq 0.05$.

**Results:** The majority of participants were general practitioners (87.5%). 86% of the study sample suffered one or more of the MSDs (back pain (56%), neck pain (47%), shoulder pain (39%) and hand/wrist pain (26%)). Females reported more shoulder pain and less back pain than males (P=0.001). Neck, shoulder and back pain were significantly increased among older dentists and dentists with more years of professional experience ($P \leq 0.0001$). More than half of the participants were not aware of the correct working postures (62.5%), the more the awareness of healthy postures the less the hand/wrist, neck and back pain ($P \leq 0.05$). Hand/wrist pain was most prevalent among dentists who only worked while standing while least prevalent among dentists mixing between sitting and standing postures ($P \leq 0.0001$).

**Conclusions:** MSDs are common among Jordanian dentists. There seems to be a substantial need for further training and continuing education on occupational health among Jordanian dentists.

**Keywords:** Musculoskeletal Disorders, Occupational Health Problems, Ergonomics, Prophylaxis, Dentists, Jordan.

*(J Med J 2011; Vol. 45 (2):195- 204)*

| ***Received*** | ***Accepted*** |
|---|---|
| *November 8, 2010* | *February 24, 2011* |

1. **BDS, M.Dent.Sc. (Perio), M.Dent.Sc. (CDH), Department of Oral Surgery, Oral Medicine and Periodontology, Faculty of Dentistry, University of Jordan, Amman, Jordan.**
2. **BDS, MPH, MS, AB (Perio), Department of Preventive Dentistry, Faculty of Dentistry, Jordan University of Science and Technology, Irbid, Jordan.**
3. **BDS, PhD, FDS RCS (England), Jordanian Board, DCE (Ireland), Head of Department of Prosthodontics, Associate Professor and Consultant of Fixed & Removable Prosthodontics and Implants, Department of Prosthodontics, Faculty of Dentistry, University of Jordan, Amman, Jordan.**

**** Correspondence should be addressed to:***
**Nicola H. Barghout**
**P. O. Box: Amman 11942, Jordan.**
**E-mail: nicolabarghout1@hotmail.com**

**Introduction**

Dentistry is acknowledged as a hard and demanding profession. Dentists describe their profession as requiring more endurance and physical self-sacrifice.[1] The unique working conditions and wide range of harmful work environmental factors were found to affect the physical health of dentists or even worsen their preexisting health problems.[1-4] It is now established that dentists have more frequent and worse health problems than other high risk medical professionals.[1]

Musculoskeletal disorders are among the most significant work-related health problems currently reported.[5] They had become an important concern for dentistry related professionals as they are highly prevalent among dentists and affect their health, productivity and careers. Consequently, this might reflect on the populations and societies.

The mechanisms underlying work-related musculoskeletal problems are multifactorial. These include the absence of ergonomic orientation or lack of attention in its use (such as anatomical and physiological fatigue due to physical/muscular strain), physical conditioning, prolonged static postures, repetitive movements, poor positioning, incorrect working posture, genetic predisposition, mental stress, age, extended work hours, inadequate lighting and inappropriately designed work locations.[1,6-10]

Valachi et al. (2003) also found a positive association between the presence of pain and specific forced postures: torsion of the trunk, moving the shoulders towards the side, elevating the elbows, operating light too far away from the line of vision when working on the maxillary arch, working with the hands close to the patient's face and working for long periods of time.[11]

The relationship between the dental professional and the patient is physically and psychologically demanding. Time limits and unpredicted technical challenges add to the environment stress.

Physical factors (such as repetitive motion and posture), mental stress and pre-existing pain modify the manifestation, persistence and aggravation of pain.[9,12,13]

Dentists apply precise motor skills with concentrated hand-eye coordination to perform dental procedures in a dynamic setting. Dental professionals often adopt uncomfortable and asymmetric positions while maintaining the head forward and rotated to the side with the arms held out from the body. These positions, if held for prolonged periods each day, might overstress muscles and joints, particularly those of the neck, shoulder and back, causing musculoskeletal symtoms.[10,14-20]

Harmful physiological changes in the body can result from these factors and postures, including muscle ischemia, imbalances, and necrosis; reduced range of joint mobility; spinal disk herniation or degeneration; and nerve compression. Pain, injury or MSDs will then follow these changes.[11]

Dentists were found to have more prevalent radiological signs and symptoms of upper body pathologic conditions when compared to subjects working in different environments, such as office employees, farmers and pharmacists.[15,17,21,22]

Most of the MSD can be avoided or at least reduced with more attention to ergonomics.[10,20] Once risks are identified, control measures should be taken to decrease the probability of this disease being made manifest. Preventing chronic pain in dentistry may require a paradigm shift within the profession regarding clinical work habits, including proper use of ergonomic equipment, frequent short stretch breaks and regular strengthening exercise.[11]

The main risk factors involved must be identified in order to design adequate prevention strategies.[1,23] Dentists are normally included within the group of professionals at risk of suffering musculoskeletal disorders, due to prolonged awkward or forced postures at work and failure to adopt preventive measures.[1,23]

Prevention includes early identification of symptoms, analysis of the activity and work posture and, equipment evaluation such as position of the dental unit, hand instruments, operator and patient's chair as well as the lighting conditions.[24]

This study was conducted to investigate the occurrence of MSDs among Jordanian dentists, and to evaluate its pattern of distribution, with the aim of applying proper methods of treatment and prophylaxis. The collected data will, hopefully, be useful in epidemiological research and for planning continuing educational courses for dentists, which may help reduce and prevent any future occupational- related health problems.

## Materials and Methods

This cross sectional study was conducted during the year 2010, among dentists in Amman, the capital of Jordan. Two hundred dentists were recruited into this study and were randomly selected from 1921 dentists all of whom are licensed dentists working within the capital Amman and registered in the Jordan Dental Association up to February 2010. Each participant was provided with full explanation of the study and their informed consent was obtained before being recruited into the study.

### Study Sample Size and Selection

To determine the size of the study sample, the following equation was applied: $N = (Z^2 \times S^2) / D^2$. After the application of the equation, N was equal to 159.8, and to make the sample more representative of the study population; 200 dentists were selected.

The sample was selected according to the dentists' working locations on the basis of proportional representation of the working location in the study population (Table 1).

To determine the distance of sampling for each chosen category, the total population of each category was divided by the sample size required of the same category. According to the tables of random numbers, a beginning number was determined for each of the 5 categories according to the register of the Jordan Dental Association.

### Study Design

A preliminary questionnaire was designed after reviewing the literature of the study topic, which was presented to five arbitrators who were dentists from The Faculty of Dentistry and The University of Jordan. After considering their observations, two more questions were added and language corrections were made.

To examine its validity, the questionnaire was tested twice on the same non target sample of 20 students from The University of Jordan and The Faculty of Dentistry within a two week time interval. A large match in the answers between the two applications was found with Pearson correlation coefficient of 0.97 and 0.95 on the variables of height and weight, respectively, which indicates the presence of a high degree of reliability and stability of the questionnaire. The final version of the constructed questionnaire consisted of 17 questions, in the form of "Multiple choice and fill in the blank" style. Data collection was made through personal interviews with the randomly selected participants. The questionnaire was used to assess whether they experienced any of the musculoskeletal disorders, and reviewed/ questioned the following aspects: the working hours, years of experience, working position, their knowledge of the correct working posture and employment of dental surgery assistant. Additional information was also requested regarding age, gender, weight, height, field of dental practice, and number of daily working hours.

### Statistical Analysis

Data were anonymously coded and Statistical Package for Social Sciences software (SPSS, version 11.5, Chicago, IL, USA) was used for data processing and analysis. Characteristics of subject's variables were described using frequency distribution for categorical variables, mean and standard deviation for continuous variables. Chi square test was used to assess the

association between categorical variables. P-value of ≤ 0.05 was considered statistically significant.

***Table (1): Sample size according to the working location of dentists.***

| *Location Categories* | *Population Size (n=1921)* | *Percentage from the total population size* | *Sample Size* (n=200)* |
|---|---|---|---|
| ***Private Clinic*** | *1379* | *71.8* | *143* |
| ***Royal Medical Services*** | *101* | *5.3* | *11* |
| ***Public Hospital*** | *155* | *8.1* | *16* |
| ***University Hospital*** | *49* | *2.5* | *5* |
| ***Private Dental Center*** | *237* | *12.3* | *25* |
| ***Total*** | *1921* | *100.0* | *200* |

**** Calculated by multiplying the percentage by 200.***

## Results

The study sample consisted of 200 dentists, 57% were males (mean age 40.6 years) and 43% were females (mean age 40.1 years). General dental practitioners constituted the majority of the sample (87.5%) with the remainder being specialists (12.5%). Twenty and half percent of the study sample were 35-39 years old while 9.5% of them were 55 years old or above.

Half of the study sample were smokers and the other half were non-smokers, but when smoking habit was stratified by gender, it was noticed that most of the smokers were males (75.4% of males and 16.3% of females).

Regarding daily working hours, the highest proportion of dentists (87%) worked for 5-8 hours per day, whereas the lowest percentage of dentists (2.5%) worked for less than 5 hours a day. Also, 31.5% of the dentists had 20 years of professional experience and above, 38% had 10-19 years of professional experience, and 30.5% of the dentists had less than 10 years of experience. Furthermore, the majority of dentists (90%) employed a dental surgeon assistant.

When the working postures of dentists were investigated, almost half of the dentists practiced dentistry sitting most of the time (52.5%), whereas 42.5% practiced dentistry while sitting all the time, and only 5% practiced dentistry while standing only.

With regard to dentists' awareness of healthy working postures, 62.5% of the study sample was not aware of healthy working postures, while only 37.5% of the participants were aware of such postures. The main sources of dentists' knowledge about the healthy working postures were university education (33%), books and literature (27%), the internet (7.5%), and conference meetings (2%).

The study results showed that (86%) of the study sample suffer from at least one or more of the musculoskeletal symptoms. The most prevalent complaints were reported in the back (56%), neck (47%), shoulder (39%), and hand/wrist (26%). 42% sought medical attention and has been diagnosed by a physician. Also, 16 dentists (8%) experienced hearing problems and 21 dentists suffered from stress.

Table (2) presents the distribution of the MSDs among the study population by age. The highest percentage of dentists with neck pain was in the age group of 55 years and more (73.7%). Also, the highest percentage of those with shoulder pain was 55 years of age or older (73.7%). As for back pain, a high rise in the prevalence was noticed in the age group 50-54 years (95.5 %).

A statistically significant relationship between age and neck pain, shoulder pain and back pain was identified (P ≤ 0.0001) (Table 2). The prevalence of these disorders increased with advancement of age. Chi square test results did not show a relationship between age and hand/wrist pain (P≥0.05) (Table 2).

Table (3) shows the MSDs distribution according gender. Higher prevalence of shoulder pain was reported among females (52.3%), while higher prevalence of back pain was reported among males (65.8%).

A statistical significance was demonstrated between gender, shoulder and back pain, but not between gender and neck and hand/wrist pain (Table 3). Females reported more shoulder pain and less back pain than males (P=0.001).

No significant relationships were found between MSDs and each of height, weight, smoking, working hours and employment of surgery assistant (P > 0.05).

The prevalence of MSDs significantly increased with the increase of years of experience (P ≤ 0.05). Neck, shoulder and back pain were more among dentists with more years of professional experience (P≤0.0001) (Table 4). However, no significant relationship was found between years of experience and hand/wrist pain (P > 0.05).

Furthermore, a significant relationship was found between working postures while practicing dentistry and hand/wrist pain (P≤0.0001). Hand/wrist pain was most prevalent among dentists who only worked while standing while least prevalent among dentists mixing between sitting and standing posture. Test results did not show a significant relationship between working postures and neck, shoulder and back pain (P > 0.05) (Table 5).

Finally, significant relationships were identified (P ≤ 0.05) between awareness of healthy working postures to practice dentistry and each of hand/wrist, neck and back pain (Table 6). The more the awareness of healthy postures, the less the hand/wrist, neck and back pain. However, no significant relationship was found between awareness of healthy working postures and shoulder pain.

***Table (2): Relationship between type of musculoskeletal disorder and age.***

| ***Age/years*** | | ***Hand/wrist pain*** | | ***Neck pain*** | | ***Shoulder pain*** | | ***Back pain*** | |
|---|---|---|---|---|---|---|---|---|---|
| | | ***F*** | ***%*** | ***F*** | ***%*** | ***F*** | ***%*** | ***F*** | ***%*** |
| ***Less than 30*** | *Yes* | *10* | *38.5* | *1* | *3.8* | *1* | *3.8* | *5* | *19.2* |
| | *No* | *16* | *61.5* | *25* | *96.2* | *25* | *96.2* | *21* | *80.8* |
| ***30-34*** | *Yes* | *9* | *25.0* | *14* | *38.9* | *10* | *27.8* | *8* | *22.2* |
| | *No* | *27* | *75.0* | *22* | *61.1* | *26* | *72.2* | *28* | *77.8* |
| ***35-39*** | *Yes* | *6* | *14.6* | *23* | *56.1* | *15* | *36.6* | *25* | *61.0* |
| | *No* | *35* | *85.4* | *18* | *43.9* | *26* | *63.4* | *16* | *39.0* |
| ***40-44*** | *Yes* | *10* | *28.6* | *19* | *54.3* | *20* | *57.1* | *21* | *60.0* |
| | *No* | *25* | *71.4* | *16* | *45.7* | *15* | *42.9* | *14* | *40.0* |
| ***45-49*** | *Yes* | *6* | *28.6* | *9* | *42.9* | *13* | *61.9* | *15* | *71.4* |
| | *No* | *15* | *71.4* | *12* | *57.1* | *8* | *38.1* | *6* | *28.6* |
| ***50-54*** | *Yes* | *6* | *27.3* | *14* | *63.6* | *6* | *27.3* | *21* | *95.5* |
| | *No* | *16* | *72.7* | *8* | *36.4* | *16* | *72.7* | *1* | *4.5* |
| ***55 and more*** | *Yes* | *5* | *26.3* | *14* | *73.7* | *14* | *73.7* | *17* | *89.5* |
| | *No* | *14* | *72.7* | *5* | *26.3* | *5* | *26.3* | *2* | *10.5* |
| ***$\chi^2$*** | | ***5.082*** | | ***30.516*** | | ***35.683*** | | ***56.142*** | |
| ***P-Value*** | | ***0.533*** | | ***0.000*** | | ***0.000*** | | ***0.000*** | |

**** F: stands for frequency.***

***Table (3): Relationship between type of musculoskeletal disorder and gender.***

| Gender | | Hand/wrist pain | | Neck pain | | Shoulder pain | | Back pain | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | | F | % | F |
| Male | Yes | 30 | 26.3 | 59 | 51.8 | 34 | 29.8 | 75 | 65.8 |
| | No | 84 | 73.3 | 55 | 48.2 | 80 | 70.2 | 39 | 34.2 |
| Female | Yes | 22 | 25.6 | 35 | 40.7 | 45 | 52.3 | 37 | 43.0 |
| | No | 64 | 74.4 | 51 | 59.3 | 41 | 47.7 | 49 | 57.0 |
| $\chi^2$ | | 0.014 | | 2.406 | | 10.385 | | 10.311 | |
| P-Value | | 0.520 | | 0.079 | | 0.001 | | 0.001 | |

***Table (4): Relationship between type of musculoskeletal disorder and years of experience.***

| Experience/ years | Answer | Hand/wrist pain | | Neck pain | | Shoulder pain | | Back pain | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | F | % |
| Less than 10 years | Yes | 17 | 27.9 | 14 | 23.0 | 11 | 18.0 | 12 | 19.7 |
| | No | 44 | 72.1 | 47 | 77.0 | 50 | 82.0 | 49 | 80.3 |
| 10-19 Years | Yes | 19 | 25.0 | 39 | 51.3 | 34 | 44.7 | 45 | 59.2 |
| | No | 57 | 75.0 | 37 | 48.7 | 42 | 55.3 | 31 | 40.8 |
| 20 and more Years | Yes | 16 | 25.4 | 41 | 65.1 | 34 | 54.0 | 55 | 87.3 |
| | No | 47 | 74.6 | 22 | 34.9 | 29 | 46.0 | 8 | 12.7 |
| $\chi^2$ | | 0.162 | | 22.998 | | 18.154 | | 58.041 | |
| P-Value | | 0.922 | | 0.000 | | 0.000 | | 0.000 | |

***Table (5): Relationship between type of musculoskeletal disorder and working postures.***

| Experience/ years | Answer | Hand/wrist pain | | Neck pain | | Shoulder pain | | Back pain | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | F | % |
| Standing only | Yes | 6 | 60.0 | 5 | 50.0 | 5 | 50.0 | 5 | 50.0 |
| | No | 4 | 40.0 | 5 | 50.0 | 5 | 50.0 | 5 | 50.0 |
| Sitting only | Yes | 31 | 36.5 | 37 | 43.5 | 31 | 36.5 | 47 | 55.3 |
| | No | 54 | 63.5 | 48 | 56.5 | 54 | 63.5 | 38 | 44.7 |
| Sitting most of the time | Yes | 15 | 14.3 | 52 | 49.5 | 43 | 41.0 | 60 | 57.1 |
| | No | 90 | 85.7 | 53 | 50.5 | 62 | 59.0 | 45 | 42.9 |
| $\chi^2$ | | 18.341 | | 0.716 | | 0.880 | | 0.219 | |
| P-Value | | 0.000 | | 0.699 | | 0.644 | | 0.896 | |

***Table (6): Relationship between type of musculoskeletal disorder and awareness of healthy working posture to practice dentistry.***

| Awareness of healthy working postures | Answer | Hand/wrist pain | | Neck pain | | Shoulder pain | | Back pain | |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | F | % |
| Yes | Yes | 26 | 34.7 | 26 | 34.7 | 27 | 36.0 | 27 | 36.0 |
| | No | 49 | 65.3 | 49 | 65.3 | 48 | 64.0 | 48 | 64.0 |
| No | Yes | 26 | 20.8 | 68 | 45.4 | 52 | 41.6 | 85 | 68.0 |
| | No | 99 | 79.2 | 57 | 45.6 | 73 | 58.4 | 40 | 32.0 |
| $\chi^2$ | | 4.685 | | 7.328 | | 0.615 | | 19.481 | |
| P-Value | | 0.024 | | 0.005 | | 0.263 | | 0.000 | |

**Discussion**

The literature contains studies regarding Musculoskeletal Disorders (MSDs) complaints among dentists in the Western and some Middle East countries. [25-28] However, literature on the current subject is scare in Jordan and still extremely limited in the Middle East and the Arab countries; despite MSDs role as one of the major causes of work related morbidity.

Previous studies showed that females had more MSDs than males.[29-31] This could be due to lesser muscle tone and a higher incidence of osteoporosis among women.[32]

In this study, females were found to report more shoulder pain and less back pain than males. This result partially coincides with previous studies but disagree with previous studies regarding back pain.[33,34] Although the reason is unclear, this association is not specific to dentistry.

The results of this study showed that neck, back and shoulder pain were significantly associated with age. Similarly, longer professional experience was associated with more neck, back and shoulder pain. The dentist's age is closely related to the professional experience they had, however, in this study both factors were analyzed as independent factors to avoid any effect of each variable on the other. This coincides with the methods of Cagnie et al. (2007).[35]

Previous studies showed controversy regarding the relationship between age and MSDs. Some find that older subjects were affected more [28,35,36] while others showed that it had no such effect [9]. Furthermore, some found that younger dentists were more involved by MSDs since affected dentists retire earlier (the healthy worker effect).[14,31]

In this study, no relationship of statistical significance was identified between daily working hours and the prevalence of the investigated MSDs. This could be explained by the finding that the majority of dentists in this study (87%) work between 5-8 hours per day.

The findings of this study correspond with other studies in regards to the relationship between working positions and MSDs.[25-36] Dentists who practice in a "standing only" position had a significantly higher hand/wrist pain. Interestingly, hand/wrist pain was higher among those who were aware of correct working positions. Therefore, it is important to alternate between sitting and standing positions while delivering care to patients.

Occupational health programs are not being carried out in a satisfactory manner nor is the adequate training of these activities being promoted in most countries. Some suggested that MSDs could be minimized through prevention, ergonomic strategies and specific therapeutic programs.[24]

Important advances in the field of ergonomics in dentistry have been made in recent years. These advances have focused on furnishing and the working environment, though preventive measures related to the dental professional have not been adopted. The main risk factors involved must be identified in order to design adequate prevention strategies.[1,23] Dentists are normally included within the group of professionals at risk of suffering MSDs, due to prolonged awkward or forced postures at work and failure to adopt preventive measures.[1]

Almost all published studies on MSDs 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 this study, are useful for identifying the prevalence of a disorder, determining the clinical features of patients, and for designing possible preventive strategies.

This study investigated the prevalence and distribution of self-reported MSD among a cross-section of Jordanian dentists. To the best of our knowledge, there is scarce information about the epidemiology of MSD in our region. The investigation showed that the prevalence of MSDs was high (86%); this corresponds with

other studies from different parts of the world. [25-27] More than half of the participants were not aware of the correct working postures and this might explain why the prevalence of MSDs is very high among the study population.

The study showed that dentists worked under conditions which generally produced MSDs. This might explain the significant increase in the prevalence of musculoskeletal symptoms with the advancement of age and the increase in number of years in practice.

This study was self-reported; the musculoskeletal symptoms were not confirmed by a physical examination, hence, there could be some misreporting of the symptoms. Also, this study did not explore the frequency and intensity of pain; therefore, we are not able to comment on the severity of the symptoms reported. However, it was noticed that almost half of the dentists (42 %) sought medical attention; this was found to be higher compared to studies conducted in Australia and Saudi Arabia (37%). [26, 37] This reflects that MSDs constitute a major concern which disturbs the dentist's daily practice.
There seems to be a substantial need for further training and continuing education on occupational health among Jordanian dentists; due to the high percentage of absence of awareness of the correct working positions. This corresponds with earlier studies [27] and suggests that ergonomics should be covered in the educational system to, hopefully prevent, and decrease risks to dental practitioners.

Further research may have to concentrate on specific risk factors related to MSDs, i.e. repetitive movements, stress, psycho-social factors and physical load. A health economic analysis of the impact of MSDs on dentistry may be useful to be considered in the future.

## Conclusions

Within the limitation of the present research, it can be concluded that the prevalence of musculoskeletal symptoms among Jordanian dentists is high; which interferes with the dentists' daily practice. Study results suggest that age, gender, number of years in practice, awareness of the healthy working position and the position of dentists while treating patients were all factors which showed a significant relationship with all or part of the studied MSDs.

## References


1. Szymańska J. Disorders of the musculoskeletal system among dentists from the aspect of ergonomics and prophylaxis. Ann Agric Environ Med. 2002; 9:169-73.
2. Myers HL, Myers LB. 'It's difficult being a dentist': stress and health in the general dental practitioner. Br Dent J 2004; 197: 89-93.
3. Puriene A, Janulyte V, Musteikyte M, Bendinskaite R. General health of dentists. Literature review. Baltic Dental and Maxillofacial J 2007; 9:10-20.
4. Hjalmers K, Soderfeldt B, Axtelius B. Psychosomatic symptoms among female unpromoted general practice dentists. Swed Dent J 2003; 27:35-41.
5. Kakosy T, Németh L. Musculoskeletal disorders caused by hand-arm vibration. Global Occup Health Network 2003; 4(winter):3-6.
6. Oliveira JT. LE R-RSI-repetitivestraininjury: aques-LER-repetitive strain injury: a questionable and harmful concept. Arq Neuropsiquiatr 1999; 57(1):126- 131.
7. Rundcrantz BL, Johnsson B, Moritz U, Roxendal G. Occupational cervico-brachial disorders among dentists: psychosocial work environment, personal harmony and life-satisfaction. Scand J Soc Med 1991; 19(3):174-180.
8. Westgaard RH. Effects of physical and mental stressors on muscle pain. Scand J Work Environ Health 1999; 25(supplement 4):19-24.
9. Lehto TU, Helenius HY, Alaranta HT. Musculoskeletal symptoms of dentists assessed by a multidisciplinary approach. Community Dent Oral Epidemiol 1991; 19:38-44.
10. Laderas S, Felsenfeld AL. Ergonomics and the dental office: an overview and consideration of regulatory influences. J Calif Dent Assoc 2002; 30.
11. Valachi B, Valachi K. Mechanisms leading to musculoskeletal disorders in dentistry. J Am Dent Assoc 2003; 134; 1344-1350.
12. Stockstill JW, Harn SD, Strickland D, Hruska R. Prevalence of upper extremity neuropathy in a clinical dentist population. JADA 1993; 124:67-72.

13. Augustson TE, Morken T. Musculoskeletal problems among dental health personnel: a survey of the public dental health services in Holland. Tidsskr Nor Laegeforen 1996; 116(23):2776-2780.
14. Rundcrantz BL, Johnsson B, Moritz U. Cervical pain and discomfort among dentists. Epidemiological, clinical and therapeutic aspects. Part 1. A survey of pain and discomfort. Swed Dent J 1990; 14(2):71-80.
15. Rundcrantz BL, Johnsson B, Moritz U. Occupational cervico-brachial disorders among dentists. Analysis of ergonomics and locomotor functions. Swed Dent J 1991; 15(5):105-115.
16. Marshall ED, Duncombe LM, Robinson RQ, Kilbreath SL. Musculoskeletal symptoms in New South Wales dentists. Austr Dent J 1997; 42:240-246.
17. Kerosuo E, Kerosuo H, Kanerva L. Self-reported health complaints among general dental practitioners, orthodontists, and office employees. Acta Odontol Scand 2000; 58(5):207-212.
18. Rucker LM, Sunell S. Ergonomic risk factors associated with clinical dentistry. J Calif Dent Assoc 2002; 30(2):139-148.
19. Chang BJ. Ergonomic benefits of surgical telescope systems: selection guidelines. J Calif Dent Assoc 2002; 30(2):161-169.
20. Yoser AJ, Mito RS. Injury prevention for the practice of dentistry. J Calif Dent Assoc 2002; 30(2):170-176.
21. Powell M, Eccles JD. The health and work of two professional groups: dentists and pharmacists. Dent Pract Dent Rec 1970; 20(11):373-378.
22. Katevuo K, Aitasaio K. Skeletal changes in dentists and farmers in Finland. Community Dent Oral Epidemiol 1985; 13(1):23-25.
23. Lalumandier JA, McPhee SD, Parrot CB, Vendemia M. Musculoskeletal pain: prevalence, prevention, and differences among dental office personnel. Gen Dent. 2001; 49:160-166.
24. Sartorio F, Franchignoni F, Ferriero G, Vercelli S, Odescalchi L, Augusti D. Work-related musculoskeletal disorders in dentistry professionals. 2. Prevention, ergonomic strategies and therapeutic programs. G Ital Med Lav Ergon. 2005; 27:442-448.
25. Alexopoulos EC, Stathi IC, Charizani F. Prevalence of musculoskeletal disorders in dentists. BMC Musculoskelet Disord. 2004; 5:16.
26. Leggat PA, Smith DR. Musculoskeletal disorders self-reported by dentists in Queensland, Australia. Aust Dent J 2006; 51: 324-327.
27. Li T, LO E, Wong A, Mok W, Leung J. Self-reported occupational-related health problems in Hong Kong dentists. Hong Kong Dental Journal 2006; 3: 33-44.
28. Pargali N, Jowkar N. Prevalence of musculoskeletal pain among dentists in Shiraz, Southern Iran. Int J occ environ med 2010; 1:69-74.
29. 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.
30. Diaz-Caballero AJ, Gómez-Palencia IP, Díaz-Cárdenas S. Ergonomicfactors that cause the presence of pain muscle in students of dentistry. Med Oral Patol Oral Cir Bucal. 2010; 15(6):e906-911.
31. Harutunian K, Gargallo-Albiol J, Figueiredo R, Gay-Escoda C. Ergonomics and musculoskeletal pain among postgraduate students and faculty members of the School of Dentistry of the University of Barcelona (Spain). A cross-sectional study. Med Oral Patol Oral Cir Bucal. 2010. [Epub ahead of print].
32. Lehto TU, Rönnemaa TE, Aalto TV, Helenius HY. Roentgenological arthrosis of the hand in dentists with reference to manual function. Community Dent Oral Epidemiol. 1990; 18:37-41.
33. Rundcrantz BL, Johnsson B, Moritz U. Pain and discomfort in the musculoskeletal system among dentists. A prospective study. Swed Dent J 1991; 15: 219-228.
34. Shrestha BP, Singh GK, Niraula SR. Work related complaints among dentists. Journal of the Nepal Medical Association 2008; 47:77-81.
35. Cagnie B, Danneels L, Van Tiggelen D, De Loose V, Cambier D. Individual and work related risk factors for neck pain among office workers: a cross sectional study. Eur Spine J. 2007; 16: 679-686.
36. Ratzon NZ, Yaros T, Mizlik A, Kanner T. Musculoskeletal symptoms among dentists in relation to work posture. Work. 2000; 15:53-58.
37. Al Wazzan KA, Almas K, Al Shethri SE, AL-Qahtani MQ. Back & neck problems among dentists and dental auxiliaries. J Contemp Dent Practice 2001; 2: 17-30.

# عوامل الخطر وانتشار الاضطرابات العضلية الهيكلية بين أطباء الأسنان الأردنيين

**نقولا برغوث،[1] رولا الحباشنة، [2] محمود العميري[1]**

**1– كلية طب الأسنان، الجامعة الأردنية، عمان، الأردن؛ 2– كلية طب الأسنان، جامعة العلوم والتكنولوجيا، اربد، الأردن**

**الملخص**

**أهداف الدراسة:** التحقيق في مدى انتشار الاضطرابات العضلية الهيكلية وأعراضها (اليد/الرسغ، الرقبة، الكتف، وآلام الظهر)، بين أطباء الأسنان والتعرف على عوامل الخطر المرتبطة بهذه الأعراض.

**طرق البحث:** اشتملت الدراسة على عينة عشوائية من 200 طبيب أسنان منهم: 114 ذكور متوسط العمر 40.6 سنه، و86 إناث متوسط العمر 40.1. وتم تعبئة الأستبانة بطريق المقابلة الشخصية وشملت العمر، الجنس، وجود اضطرابات عضلية هيكلية، ساعات العمل اليومية، سنوات الخبرة، وضعية ممارسة المهنة، معرفة الأطباء بوضعيات العمل الصحية، وإذا ما كانوا يوظفون مساعدة سنية أم لا. تمت معالجة البيانات وتحليلها باستخدام اختبار مربع كاي وحددت قيمته ب $P \leq 0.05$.

**النتائج:** كانت غالبية المشاركين من أطباء الأسنان العامين (87.5%). ووجد أن 86% من عينة الدراسة يعانون من واحدة أو أكثر من الاضطرابات العضلية الهيكلية (آلام الظهر 56%، آلام الرقبة 47%، آلام الكتف 39% وآلام اليد/الرسغ 26%). وكانت آلام الكتف أكثر وآلام الظهر أقل عند الإناث منها عند الذكور ($P = 0.001$). وكان هنالك زيادة ملحوظة في آلام الرقبة، الكتف وآلام الظهر بين أطباء الأسنان كبار السن وذوي سنوات الخبرة المهنية الطويلة ($P \leq 0.0001$). وكان أكثر من نصف المشاركين على عدم دراية بوضعيات ممارسة المهنة الصحيحة (62.5%)، وكلما زاد الوعي بالوضعيات الصحية قلت آلام اليد/الرسغ، الرقبة وآلام الظهر ($P \leq 0.05$). وكانت آلام اليد/الرسغ الأكثر انتشارا بين أطباء الأسنان الذين يمارسون المهنة وقوفا وأقلها انتشارا لدى الذين يجمعون بين ممارسة المهنة وقوفاً وجلوساً ($P \leq 0.0001$).

**الاستنتاج:** إن الاضطرابات العضلية الهيكلية شائعة بين أطباء الأسنان الأردنيين، ويبدو أن هناك حاجة كبيرة لمزيد من التدريب والتعليم المستمر في مجال الصحة المهنية بين أطباء الأسنان الأردنيين.

**الكلمات الدالة:** الاضطرابات العضلية الهيكلية، مشاكل الصحة المهنية، بيئة العمل، الوقاية، أطباء الأسنان، الأردن.