Prevalence of Musculoskeletal Disorders among Dentists in Casablanca’s Dental Center

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ABSTRACT

Background : Musculoskeletal disorders are the most common occupational pathologies among dentists around the world but studies are quite limited. The present study was carried out to investigate the prevalence of MSDs among dentists in Casablanca, Morocco.

Methods : This was a cross-sectional descriptive study conducted among the medical staff (120 dentists) of Casablanca’s Dental Center, part of the Ibn Rochd University Hospital, Morocco over a period of 3 weeks from July 24, 2017 to August 11, 2017. The study was based on a self administered questionnaire which comprises two parts : the first part included physical characteristics, academic life, clinical practice, ergonomics and work methods ; and second part consists of the “Standardized Nordic Questionnaire” or Nordic style questionnaire.

Results : The prevalence of musculoskeletal disorders in our sample was 71.67%, predominately affecting the neck, the upper and the lower back.

Conclusion : Prevalence of MSDs was high among Moroccan dentists and the prevention of these disorders requires the adoption of a correct posture, good working habits, an ergonomic organization of the workspace, as well as the integration of regular physical activities in order for the dentist to maintain a good quality of life.

KEYWORDS: Musculoskeletal disorders, dentists, Occupational health.

INTRODUCTION

Musculoskeletal disorders (MSDs) are defined as a group of injuries that affect various regions of the musculoskeletal system, these areas include the muscles, tendons, skeleton, cartilage, joints, ligaments, nerves, and the vertebral column.[1]

These disorders occur after hyper-stress on these structures, most often by repetition of a pathogenic gesture. They are multifactorial, deferred, evolving over the years, and cover all kinds of conditions, from mild disorders and temporary to irreversible injuries and chronic states of incapacity. [2] They are manifestation of a mismatch between the biomechanical solicitations and the functional capacities of the individual.

MSDs are among the most common professional pathologies in the industrialized world. Dentists have a higher prevalence of MSDs compared with office workers due to the nature of dental work being in a restricted field, sitting for a prolonged time with an awkward body position, and using heavy forces in repetitive movements compounded by a lack of recovery breaks and exercises [3,4,5,6].

The literature reports that there is a close correlation between the psycho-social environment and the onset of
MSDs: stress directly influences the posture, movements and muscle tone of the practitioner, thus leading to these disorders. [7,8]

The objectives of this study were to assess the prevalence of musculoskeletal disorders among the dental professionals of Casablanca’s Dental Center, to identify associated factors and determine the different anatomical sites most affected by musculoskeletal disorders.

MATERIALS AND METHODS
We conducted a cross-sectional descriptive study within casablanca’s Dental Center, part of the Ibn Rochd University Hospital in Morocco over a period of 3 weeks from July 24, 2017 to August 11, 2017.

Participants and sample size:
A self-administered survey was prepared and distributed to the entire of dental professionals practicing at Ibn Rochd University Dental center of Casablanca (Morocco), namely 148 dentists including, 27 professors, 12 associate professors, 11 assistants professors, 32 dental specialists, 50 residents, and 16 interns. The exclusion criteria included practitioners who have had an accident or surgery on the musculoskeletal system and women who are pregnant or have given birth, during the two years preceding the study.

Data collection procedure: A questionnaire was developed in two parts: the first one relating to the variables: physical characteristics, physical activity practice, academic life (status, service, seniority), clinical practice, ergonomics and work methods.

The second part consists of the Standardized Nordic Questionnaire (SNQ) which is widely used by occupational physicians to screen for musculoskeletal disorders [9].

The data analysis: was done with the Epi Info Software under Windows. We used the Chi2 and Fisher test for the comparison of percentages and the Anova one-factor test for the comparison of averages. The statistical significance level (p) was set at 5%.

Ethical considerations: Dentists were informed of the survey’s objectives and their oral consent was obtained prior to the administration of the questionnaire. Anonymity and data confidentiality were maintained throughout the study.

RESULTS
Of the 148 moroccan dentists practicing in Casablanca’s Dental Center who received the questionnaire, 120 dentists responded and completed the survey (response rate of 81.08%). The average age was 33.79 years with a deviation of 4.9 years. The average age of women was 34.91 years.

The data analysis revealed that 87.5% of respondents have spent at least one break during the day. 80 (66.7%) reported working overtime and 95% took at least one break during the day.

The fatigue, which is one of the main factors correlating with musculoskeletal disorders, was very common among the practitioners surveyed. 88.4% of them reported experiencing some or a lot of physical or mental fatigue at work.

Table 1: Personal characteristics and working experience of dentists.

| Variables | N  | %   |
|-----------|----|-----|
| Gender    |    |     |
| Male      | 21 | (17.5) |
| Female    | 99 | (82.5) |
| Age:      |    |     |
| [23-35]   | 79 | (65.8) |
| [35-50]   | 31 | (25.9) |
| >50       | 10 | (8.3)  |
| Get a diagnosis of MSD |        |
| Yes       | 71 | (59.2) |
| No        | 49 | (40.8) |
| Disease risk factor for MSDs |        |
| Yes       | 6  | (5) |
| No        | 114 | (95) |
| Accident history |        |
| Yes       | 23 | (19.2) |
| No        | 97 | (80.8) |
| Hormonal pathologies |        |
| Yes       | 54 | (45) |
| No        | 66 | (55) |
| Sport     |    |     |
| Oui       | 55 | (46.2) |
| Non       | 64 | (53.8) |
| Speciality |        |
| Prosthodontics | 32 | (26.7) |
| Orthodontics | 14 | (11.7) |
| Periodontics | 15 | (12.5) |
| Restorative and endodontic dentistry | 16 | (13.3) |
| Pediatric dentistry | 22 | (18.4) |
| Surgery   | 18 | (15) |
| General practitioner | 3 | (2.5) |
| Status    |    |     |
| Interne   | 14 | (11.7) |
| Resident  | 46 | (38.3) |
| Spécialiste | 24 | (20) |
| Assistant Professor | 9 | (7.5) |
| Associate Professor | 9 | (7.5) |
| Professor of higher education | 18 | (15) |

Variables related to ergonomics and work methods
In this study sample, 21(17.5%) of practitioners reported not paying attention to their posture, and only 10 (8.33%) reported being careful with their work positions. As well 50 (41.7%) of them are working mainly when seated, 11 (9.2%) choose to work standing and 59 (49.1%) alternated the two positions. (Table 2).

Results of the Standardized Nordic Questionnaire (SNQ):
The results of the Standardized Nordic Questionnaire showed that 86 practitioners in our sample had musculoskeletal disorders with a prevalence of 71.67%. The anatomical areas most affected by pain and discomfort were the neck, upper and lower back. (Figure 1, 2 and 3).

The Nordic style Questionnaire is considered positive when at least one upper limb symptom is noted in the previous year or week [10]. The result of crossing the positive SNQ and the different variables is shown in (Table 3 and 4).
Table 2: Characteristics related to daily clinical practice and population ergonomics.

| Variables                        | N   | %   |
|----------------------------------|-----|-----|
| **Overtime Hours**               |     |     |
| No                               | 40  | (33.3) |
| Mildly                           | 41  | (34.2) |
| Enough                           | 25  | (20.8) |
| Much                             | 14  | (11.7) |
| **Breaks during the day**        |     |     |
| Yes                              | 114 | (95) |
| No                               | 6   | (5)  |
| **Physically tiring work**       |     |     |
| Mildly                           | 14  | (11.7) |
| Enough                           | 42  | (35) |
| Much                             | 64  | (53.3) |
| **Mentally tiring work**         |     |     |
| Mildly                           | 14  | (11.7) |
| Enough                           | 47  | (39.2) |
| Much                             | 59  | (49.1) |
| **Attention to posture**         |     |     |
| Never                            | 21  | (17.5) |
| Moderately                       | 68  | (56.7) |
| Enough                           | 21  | (17.5) |
| Always                           | 10  | (8.3) |

Muscle power
- Low: 9 (7.5)
- Medium: 76 (63.3)
- Excessive: 35 (29.2)

Posture at work
- Sitting: 50 (42)
- Standing: 10 (8.4)
- Both: 59 (49.6)

Repetitive gestures
- Yes: 115 (95.8)
- No: 5 (4.2)

Lighting
- Sufficient: 57 (47.5)
- Insufficient: 63 (52.5)

Use of optical aid
- Yes: 34 (28.3)
- No: 86 (71.7)

Suitable equipment
- Not at all: 17 (14.2)
- Mildly: 52 (43.3)
- Enough: 46 (38.3)
- Much: 5 (4.2)

Figure 1: Pain or discomfort felt during the last 7 days and 12 months depending on anatomical zones.

Figure 2: Average intensity of pain felt when filling out the questionnaire by anatomical region.
### Table 3: Physical characteristics and working experience of practitioners with a positive SNQ

| Variables               | N  | %    | P     |
|-------------------------|----|------|-------|
| Gender                  |    |      |       |
| Male (21)               | 12 | (57.1)| 0.104 |
| Female (99)             | 74 | (74.7)|       |
| Diseases risk factor MSDs|    |      |       |
| Yes (6)                 | 5  | (83.3)| 0.674 |
| No (114)                | 81 | (71.1)|       |
| Accident history        |    |      |       |
| Yes (23)                | 18 | (78.3)| 0.435 |
| No (97)                 | 68 | (70.1)|       |
| Seniority               |    |      |       |
| [1 - 10]                | 60 | (73.2)|       |
| [10 - 20]               | 13 | (61.9)| 0.535 |
| [20 - 30]               | 10 | (76.9)|       |
| Sport                   |    |      |       |
| Yes (55)                | 36 | (65.5)| 0.124 |
| No (64)                 | 50 | (78.1)|       |
| Speciality              |    |      |       |
| Prosthodontics (32)     | 22 | (68.75)|      |
| Orthodontics (14)       | 11 | (78.6)|       |
| Periodontics (15)       | 10 | (66.7)| 0.204 |
| Restorative dentistry (16) | 12 | (75) |       |
| Pediatric dentistry (22) | 20 | (90.9)|       |
| Surgery (18)            | 9  | (50) |       |
| General practitioner (3) | 2  | (66.6)|       |
| Status                  |    |      |       |
| Interne (14)            | 10 | (71.4)|       |
| Resident (46)           | 33 | (71.7)|       |
| Specialist (24)         | 20 | (83.3)| 0.414 |
| Assistant Professor (9) | 6  | (66.7)|       |
| Associate Professor (9) | 4  | (44.4)|       |
| Professor of higher education (18) | 13 | (72.2) |       |

### Table 4: Ergonomics and daily practice of practitioners with a positive SNQ

| ErgoVariables            | N  | %    | P     |
|--------------------------|----|------|-------|
| Attention to posture     |    |      |       |
| Yes (99)                 | 70 | (70.7)| 0.613 |
| No (21)                  | 16 | (76.2)|       |
| Repetitive gestures      |    |      |       |
| Yes (115)                | 83 | (72.2)| 0.621 |
| No (5)                   | 3  | (60) |       |
| Mentally tiring work     |    |      |       |
| A little (14)            | 8  | (9.3) |       |
| Enough (47)              | 35 | (40.7)| 0.432 |
| Much (59)                | 43 | (50) |       |
| Physically tiring work   |    |      |       |
| A little (14)            | 6  | (7)  |       |
| Enough (42)              | 27 | (31.4)| 0.05* |
| Much (64)                | 53 | (61.6)|       |

**DISCUSSION**

In this study, a self-administered survey was distributed to dentists practicing in governmental dental sector to investigate the prevalence of MSDs, determine the different anatomical sites most affected by musculoskeletal disorders and identify associated factors. We assessed musculoskeletal symptoms by Standardized Nordic Questionnaire, which is an internationally accepted screening instrument for assessing MSDs [11]. This study is the first on the subject with Moroccan dentists.

Our results showed a higher prevalence of musculoskeletal disorders 71.67% among dentists, this is similar to previously published surveys conducted by El Meisha et al. [4], Al-Ali et al.[12], and Feng et al.[13] (70%, 68%, and 88% respectively). Dentistry is a profession with high risk of developing MSDs. They are the most common cause (29.3%) of early retirement among dentists [11].

Female dentists in our sample were more prone to MSDs than male dentists. This is in agreement with the literature [14,9,15,16] where the difference in prevalence between the two genders was statistically significant [17,18,19]. Some studies attributed this gender difference to low muscle tone and strength, hormonal changes, and a higher incidence of osteoporosis among females [20,21]; and some others explained the difference by the fact that female practitioners would tend to make greater physical effort for similar performance [22].

In the present survey, we noted that the prevalence of musculoskeletal disorders tended to decrease for the most experienced practitioners (Assistant Professors and
Indeed, all the authors have actively participated in the redaction, the revision of the manuscript and provided approval for this final revised version.

AUTHORS’ CONTRIBUTIONS

The participation of each author corresponds to the criteria of authorship and contributorship emphasized in the Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly work in Medical Journals of the International Committee of Medical Journal Editors.
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COMPETING INTERESTS

The authors declare no competing interests.
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