

Musculoskeletal Disorders among Dentists in Bulgaria: Nature and Conducive Factors

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Abstract: *Musculoskeletal disorders (MSD) are a common problem among dentists in Bulgaria. Both socio-demographic and occupational factors play their role in MSD manifestations. The results reported are based on a survey of 700 dentists in Bulgaria. They evidence that the percentage of females with MDS compared to males is higher. The longer the dental practice is, the higher the share of dentists experiencing such pains.*

Keywords: musculoskeletal disorders, dentists, length of service, weekly and daily workload

1. Introduction

Musculoskeletal disorders are defined as: *Damage of muscles, tendons, peripheral nerves or vascular system, not a result of acute, momentary events (14, 15)*. These damages are thought to be occupational hazards and their most common objective symptom is pain. The work environment and style significantly conditions their origin. In fact these are just some of the causes that result in this multi-factor disease. The most frequent musculoskeletal disorders in dental medicine are due to the long hours of static postures, typical for the work process.

The large-scale rate of musculoskeletal disorders indicates health status worsening, often due to the impact of the following factors: labor intensification; unrelieved performance full of repetitive actions, resulting in overstrain of certain parts of or the entire body; non-compliance to the ergonomic requirements in setting the work place; poor work scheduling, lack of possibilities to take adequate work break, non ergonomic work posture; occupational stressors and lacking tools to cope with them successfully.

Musculoskeletal disorders of dental specialists are subject of a large number of studies, focused on pain, experienced by the practitioners. In a study, held back in 1946 F.E Biller (3) established that 65% of the dentists suffered back pain.

A large number of studies reveal that musculoskeletal disorders are multi-factored (4, 5, 9, 11, and 12). Pain is associated with risk factors such as continued static pose, repetitive movements, lack of optimal light, poor patient positioning, genetic predisposition, physic stress, physical status, and age.

The aim of this study is to establish the dependence of the MSD-provoked pain on some conducive factors: gender, age, length of service, weekly and daily workload, as well as the predominant type of occupational activity.

The study objectives cover:

1. Socio-demographic characteristics of the study sample – distribution by gender, length of service, weekly and daily workload of the dentists in Bulgaria.
2. Establishing the dependency between the listed factors and the presence of pain, due to MSD.

2. Study Material and Methods

The source information needed for the purposes of the study was gathered based on a survey, conducted by distributing and collecting filled in questionnaires in the period October 2012-April 2013. We developed the survey questionnaire specifically for this study. The survey was conducted with the support of BDU and the regional bodies in Sofia, Pleven, Shoumen, Varna, and Vratza. A total of 1300 questionnaires were prepared and disseminated, of which we got back 700 (return rate – 53.84%). They comprised of 27 close questions (answers fixed) on paper, each having a unique entry code.

The age groups covered by the study are almost equally presented, except for the 66+ age group: 25-35 age group – 163 participants (23,35%), 36-45 - 171 individuals (24,50%), the 46-55 age group is the most numerous - 196 individuals (28,08%), 56-65 age group - 139 (19.91%), and the least presented age group of 66+ - only 29 (4,15%) i.e. all age groups were included. The relative share of dentists having over 20-years length of service is distinctly high (54.33%). It suggests more representative data on the impact of dental-specific factors, causing MSD. The major share of dentists, participating in the study, is as follows: general practitioners (58.03%), followed by the group, practicing mostly conservative dental care (12.49%) and prosthetic dental medicine (10.29%). Comparatively lower is the share of those practicing specific narrow specialties such as: oral surgery (7.40%), pediatric dental medicine (6.47%), periodontology (3.12%) and the least share is that of orthodontology (2.20%).

3. Results

Interdependence of MSD-caused pain and gender

A very large percent of the surveyed dentists - 564 (81.85%) report presence of pain they associate with the nature of the occupation. The study results reported statistically significant differences in the prevalence of MSD-type of pain depending on the subjects' gender.

The share of women, complaining of pain is significantly higher (87.16%) compared to men (72.24%) (Table 1).

Table 1: Gender Dependent Pain Prevalence

Presence of pain caused by MSD Gender	Yes	No	Total
	n %	n %	n %
Males	177 (72,24%)	68 (27,66%)	245 (100%)
Females	387 (87,16%)	57 (12,84%)	444 (100%)

N=689 p<0,05

Interdependence of MSD-caused pain and length of service

Pain presence is observed in respondents of all groups of varying length of service (Fig.1). Out of 687 respondents, 564 (82.09%) experience pain due to MSD, while 123 (17.1%) don't have such complaints. Among the subjects with length of service up to 10 years the relative share of those with pain is the smallest compared to the remaining 3 groups, yet the level is also high – 71.6%. The longer the length of service, the higher the share of work-related MSD complaints gets, reaching an extremely high percent of 91.01% for those with over 31 years length of service. There is statistically significant dependence of the incidence of musculoskeletal type of pain for the groups of various length of service as dentists.

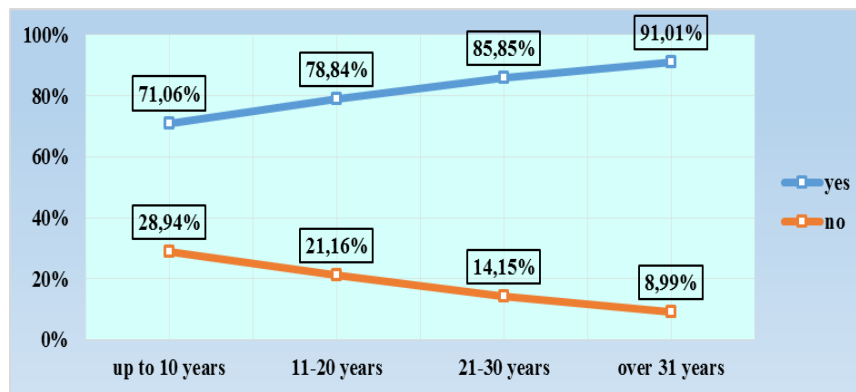


Figure 1: Chart illustration on dependence between MSD-caused pain and length of service

Hence we may conclude that musculoskeletal disorders in dentists accumulate with the increase of the years of service.

Weekly workload and dependence between MSD-caused pain and weekly workload

Studying the dentists' work week duration in days we found out that almost 2/3 (534) of all surveyed (76.50%) work up to 5 days a week, 133 (19.05%) – more than 5 days and only 31 (4.45%) work less than 3 days weekly (Fig.2).

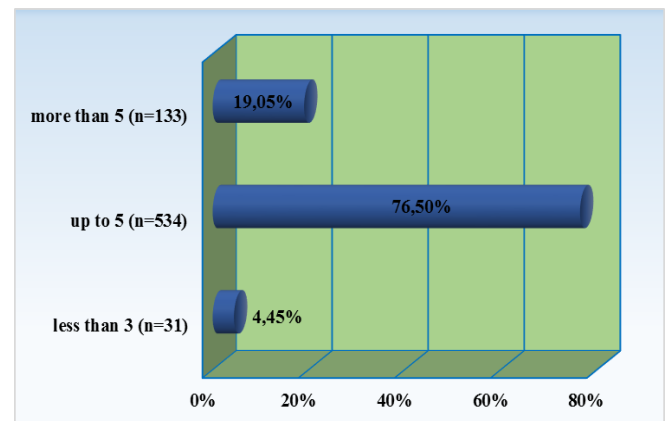


Figure 2: Average weekly workload in days

We traced the relationship between dentists' work week duration in days and the presence of MSD type of pain, which they associate with their occupational activity (Table 2).

Table 2: Dependence between work week duration and presence of pain

Weekly workload (in days)	Presence of MSD-caused pain		
	Yes n %	No n %	Total n %
Up to 3 days	24 (77,41%)	7 (22,59%)	31 (100%)
Up to 5 days	444 (83,93%)	85 (16,07%)	529 (100%)
Over 5 days	100 (75,18%)	33 (24,82%)	133 (100%)

N=693 p<0,05

It is clear that the most common work schedule is up to 5 days a week, respectively these are the dentists, generating the highest level of pain - 83,93%, followed by those working up to 3 days (77,41%) and more than 5 days (75,18%). It's striking that irrespective of the type of weekly workload, the total share of dentists experiencing pain (81,97%) is at least four times the share of those without pain (18,03%).

Statistically significant dependence is present between the dentists' work week duration in days and the presence of MSD type of pain.

Daily workload and dependence between MSD-caused pain and daily workload

Likewise the weekly workload, the daily workload was also studied. The results indicated that 75.79% worked a full work day, while 15.47% exceeded 8 hours a day. Only 8.74% have a half-day work schedule, i.e. less than 4 hours daily (Fig.3).

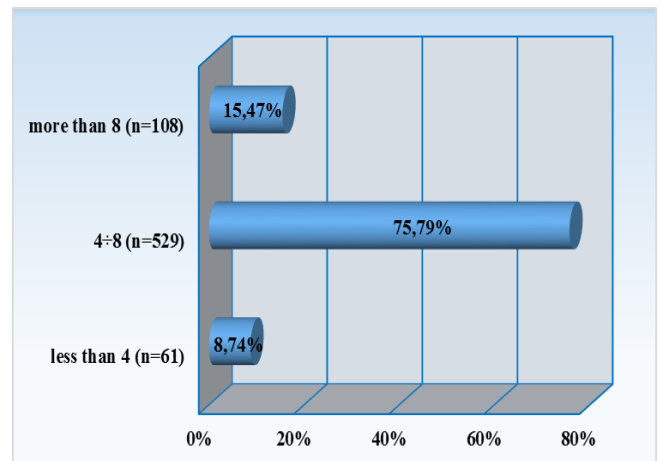


Figure 3: Average work day duration in hours

We also explored the relationship between the work day duration (in hours) and the presence of MSD-caused pain (Table 3).

Table 3: Dependence between workday duration in hours and presence of pain, dentists associate with their work activity

Daily workload in hours	Presence of MSD-provoked pain		
	Yes n %	No N %	Total n %
Less than 4	47 (78,33%)	13 (21,67%)	60(100%)
4-8	433 (82,31%)	93 (17,69%)	526 (100%)
over 8	89 (82,40%)	19 (17,60%)	108 (100%)

N=694 p>0,05

Similar to the weekly workload, the highest relative share is among those working over 8 hours (82.40%), followed by the group working 4 to 8 hours (82.31%) and less than 4 hours (78.33%). It is evident from this table that irrespective of the daily workload type, the share of those with pain due to MSD (81.98%) is times higher the share of those having no complaints (18.01%). However, there is no statistically significant dependence between these two parameters. It is likely the significant factors to lie more in the dental procedures' workload for the work time stated and/or the very type of the procedures.

4. Discussion

Data from publications we could access indicate that according to some studies there is no significant difference in MSD morbidity between younger and older colleagues (9, 11). Other studies report however that young dentists suffer more serious MSD impact than their older colleagues. Most authors explain it by the circumstance that the older get used to the long hours of inappropriate working position and feel it as physiological for them therefore they don't practically complain (1, 2, 7, 12). According to A. Kierklo et al. (6), back, lumbar and arm pain disorders are significantly more common in dentists with longer length of service.

Our study results indicate that with the increase of the years of service the share of work-related musculoskeletal disorders also increases, going to a very high level of 91.01% in the eldest colleagues with over 31 years length of service.

As to dental-related gender MSD morbidity our results are similar to officially published data, indicating that women are significantly more affected than men (1 2, 8, 9, 12, 13).

Our study reveals that most frequently MSD are present in dentists with the most typical weekly workload (up to 5 days – 83.93%) and at daily workload over 8 hours (82.40%). Generally in all the three weekly and daily workload schedules the share of dentists, experiencing pain is very high (over 77%).

5. Conclusions

- 1) Women suffer from musculoskeletal disorders significantly more than men do. With the increase in length of service the share of dentists with occupational activity-associated pain also increases.
- 2) Dentists in Bulgaria generally work up to 5 days a week 4 to 8 hours daily. Despite their weekly or daily workload, the relative share of those, stricken by MSD-originating pain exceeds 82%.

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