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The relationship between physical load and musculoskeletal complaints among Brazilian dentists

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ABSTRACT

The aim of the present study was to assess the relationship between physical load and musculoskeletal complaints in dentistry and to analyze the prevalence and severity of such complaints in nine anatomical regions using a cross-sectional study of 387 dentists from Natal, Brazil. The highest prevalence of complaints was related to the lower back (58.4%) and the lowest prevalence was found in the elbow (10.3%). In general, symptoms were classified as mild because they did not cause absence due to illness. Pain complaints were associated with the following characteristics: awkward posture at work; prolonged standing or sitting; strenuous position of the upper limbs; excessive tightening of the hands during clinical treatment; and the use of vibrating tools. The results of the present study suggest a high prevalence of musculoskeletal complaints in dentists that are significantly associated with variables related to their physical workload.

1. Introduction

Musculoskeletal disorders are among the most important issues of occupational health. The occurrence of these disorders has mainly been investigated through pain complaints. This is especially true among dentists, where the high prevalence of pain in different anatomical regions of the body has been associated with their occupational activity (Hayes et al., 2009). Among the different anatomical regions affected, studies have noted that the lower back, neck, and shoulders exhibit a high prevalence of pain (Leggat et al., 2007; Morse et al., 2010; Lin et al., 2012). The literature has recognized that these complaints, which occur during the practice of dentistry, have considerably contributed to morbidity, while reducing productivity and possibly leading to premature retirement (Crawford et al., 2005; Leggat et al., 2007). Among the most common practices performed by dental professionals, the use of vibratory tools, excessive repetition of movements and the static maintenance of inadequate posture for long periods of time are notable (Morse et al., 2010). These situations involve a high demand for physical strength in this occupational activity.

Within this context, Rolander and Bellner (2001) investigated the high physical work demands and the elevated workload of a group of dentists. The authors observed a high prevalence of musculoskeletal complaints, especially in the neck and shoulders. However, the intensity of pain perception in these regions was low, and there was only a weak correlation between pain and physical workload.

Alexopoulos et al. (2004) found a strong association between neck and shoulder pain and the physical workload of professional dentists. Therefore, based on the disagreements among previous studies, associations between physical overload and musculoskeletal symptoms among dentists have not been clearly defined. Further studies are required to elucidate this question.

Jonker et al. (2009) and Åkesson and Balogh, (2012) attempted to establish objective measurements to quantify the physical workload of dentists. They used electromyography and inclinometry to assess the activity of specific muscles during dental appointments. Despite the fact that these methods helped to observe the elevated tension to which these professionals are submitted, an association between physical load and musculoskeletal symptoms was not clearly demonstrated.

In addition, there are no studies to date that have been conducted with Brazilian dentists in an attempt to confirm the

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association between musculoskeletal symptoms and the physical load of dental work. In one of the most recent studies involving Brazilian dentists, Alexandre et al. (2011) reported that these professionals exhibit an elevated risk of acquiring musculoskeletal disorders, in comparison with other professions, although the same authors did not investigate whether their occupational physical load was associated with this result.

For these reasons, the aim of the present study was to confirm the association between physical load in dentistry and musculoskeletal complaints in dentists working in the city of Natal (Brazil) and to analyze the prevalence and severity of such complaints in nine anatomical regions.

2. Subjects and methods

A cross-sectional study was performed with 387 dentists practicing in the city of Natal, State of Rio Grande do Norte (RN), Brazil. The sampling process involved a formal invitation to dentists that were active in the city, with voluntary participation.

According to Medronho et al. (2009), the following elements must be considered when calculating sample size in this type of study: finite population size (1957 dentists registered at the Regional Council of Dentistry of Rio Grande do Norte and active in the municipality of Natal in 2012); lowest estimated prevalence of the outcome (58%) reported in the literature (Santos Filho and Barreto, 2001); tolerable error (5%); and confidence interval (95%). According to these criteria, the random and representative sample size for the present study would be 314 dentists. However, due to the quantity and availability of dental professionals in Natal/RN (387 professionals), this sampling size was not realistic. Furthermore, 47 of these professionals met at least one of the exclusion criteria, which included the following: currently on leave of absence; exercising clinical activity for less than one year; exhibiting some disease of the musculoskeletal system or connective tissue that was diagnosed before the initiation of professional clinical practice.

2.1. Self – administered questionnaire

A self-administered questionnaire that contained initial information on the importance of the work was distributed to the survey subjects. The first part of the questionnaire contained items related to the severity of musculoskeletal complaints in nine anatomical regions using the validated Brazilian version of the Nordic Musculoskeletal Questionnaire (Pinheiro et al., 2002). Fig. 1 displays the nine anatomical regions assessed.

Complaints were scored using the following five-point scale: 0 = No complaints; 1 = Complaints in the 12 preceding months or seven preceding days; 2 = Complaints in the 12 preceding months and seven preceding days; 3 = Complaints in the 12 preceding months or seven preceding days, with leave of absence; 4 = Complaints in the 12 preceding months and seven preceding days with leave of absence. The collected data were categorized as follows for each anatomical region: 0 = No pain; 1–4 = Presence of pain. The severity of complaints could be classified based on the presence of pain. A score of 1 or 2 corresponded to mild complaints, whereas scores of 3 or 4 indicated severe complaints.

With respect to physical workload, five questions about inadequate working posture were addressed. These questions were structured as follows: 1. Does your work regularly involve uncomfortable positions, such as a flexed or twisted torso? 2. Do you spend long periods of time standing or sitting? 3. Do you hold your upper limbs in a strenuous position, such as raising your arms for a long time? 4. Does your work involve excessive pressing force with your hands? 5. Do you use vibratory tools? In accordance with Alexopoulos et al. (2004), a four-point scale was used for the questions related to physical workload. This scale was composed of the following answers: “seldom or never,” “sometimes,” “often,” and “always.” The answers “often” and “always” were classified as having high exposure, whereas “seldom or never” and “sometimes” were classified as having low exposure.

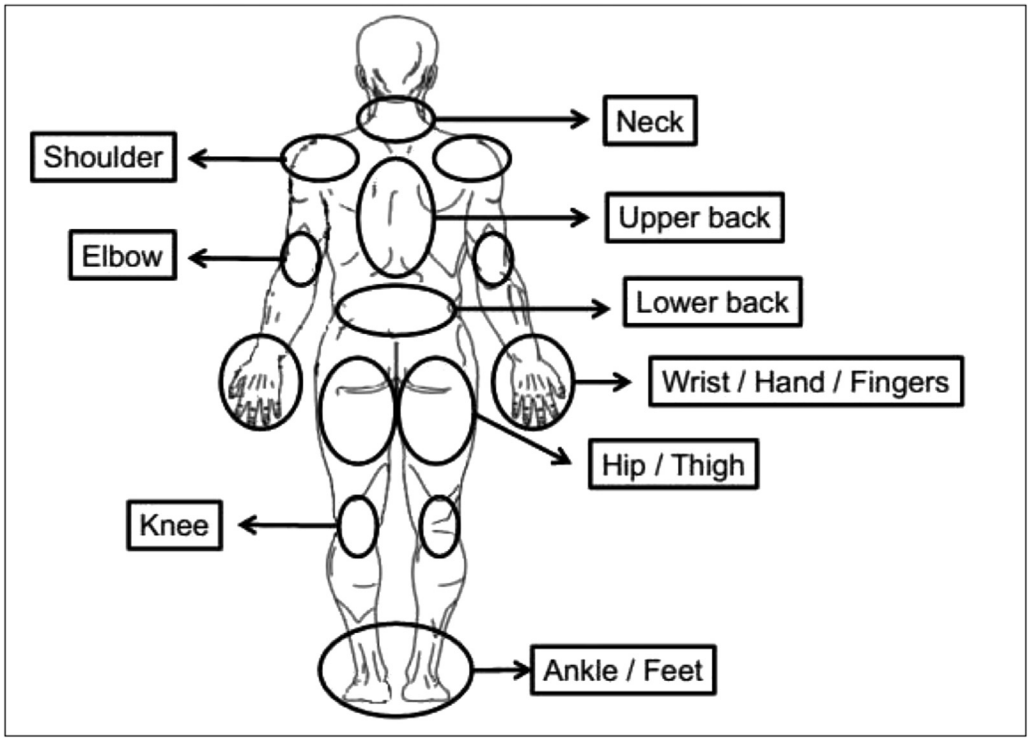

Fig. 1. Anatomical regions assessed in a sample of dentists from the city of Natal in the state of Rio Grande do Norte, Brazil.