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Original Article

Prevalence of and risk factors for low back pain among dentists

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Abstract. [Purpose] The purpose of this study was to determine the prevalence, symptoms of, and risk factors for low back pain among dentists as well as to discover the possible correlation of these factors with working posture and how to reduce their prevalence. [Subjects and Methods] The study was conducted among 60 dentists (28 male and 32 female) with a mean age of 25.7 years. Dentists were evaluated with the self-administered Nordic musculoskeletal evaluation chart, postural discomfort chart, and a self-prepared questionnaire. [Results] The data showed a 70% incidence of back pain among dentists, with low back pain predominating in 47.6% of cases. Most of the subjects (90.5%) had a mild-to-moderate level of severity, and only 9.5% had a severe level of low back pain. The majority of the dentists (57%) treated 1–3 patients per day. Only a few dentists (17%) exercised during their rest period even though 57% of them reported taking a break during their working hours. Although 63% of the dentists were aware of the advantages of assistive tools, only 40% of them used any kind of assistive devices. [Conclusion] Dental professionals demonstrate a high prevalence of low back pain.
Key words: Dentists, Back, Risk

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INTRODUCTION

Job-related musculoskeletal disorders (MSDs) usually happen over a period of time, resulting from repeated workload exposures. The neck, low back, and upper limbs are commonly vulnerable to MSDs[1)]. Dentists are at high risk for neck and back pain. Awkward working postures, repetitive work, and prolonged standing can result in damage to muscles, joints, bones, ligaments, tendons, nerves, and blood vessels, which can then lead to pain, fatigue, and various MSDs. The type of pain varies, ranging from a stiff feeling to definite pain. Low back pain (LBP) is the most frequent complaint, and almost all dentists worldwide have experienced this during their careers[2–4)].

Dental professionals spend most of their work days in static, awkward positions. To prevent errors, they need to assume and maintain steady hands and awkward postures. Awkward and strained postures might cause backache, and repetitive activities and psychosocial stressors might lead to shoulder and neck pain. Altered positions assumed while performing dental work are known to lead to occasional pain in dentists[5)].

Various preventive measures can be taken, such as stretching before work, taking a break in the middle of the day, performing procedures with good body posture, and reducing repetitive motion. However, many other factors may still be associated with LBP. The literature suggests other associated factors are age of the dentist, number of patients treated per day, and type of cases handled[6, 7)].

Work-related MSDs of the low back, in any occupation, are found to be a frequent cause of loss of work. The objectives of this study were to investigate the risk factors, prevalence, and association of physical load and general health status with the onset of LBP. Additionally, we aimed to determine the individual characteristics of workers, such as age, sex, experience, and physical condition etc., with the goal of correcting unhealthy postures, preventing prolonged repetitive movements and intense work schedules, etc. To establish preventative measures for back pain, the causes need to be investigated.

SUBJECTS AND METHODS

A total of 60 dentists (32 females [53.3%] and 28 males [46.7%]) completed an anonymous questionnaire focused on LBP. This study was approved by the Scientific Research Ethical Committee, Faculty of Applied Medical Sciences.

The questionnaire was divided into 3 parts. The first

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Table 1. Distribution of gender

Gender	Number	%
Male	28	46.7%
Female	32	53.3%
Total	60	100%

Table 2. Distribution of the incidence of low back pain

Incidence of low back pain	Number	%
Yes	42	70%
No	18	30%
Total	60	100%

Table 3. Distribution of site of injury

Site of injury	Number	%
Cervical	6	14.13%
Upper back	4	9.5%
Lower back	20	47.6%
More than 1 site	12	28.6%
Total	42	100%

Table 4. Distribution of severity of injury

Severity of injury	Number	%
Severe	4	9.5%
Moderate	18	42.9%
Mild	20	47.6%
Total	42	100%

Table 5. Distribution of years of work

Years of work	Number	%
(1−4)	18	30%
(5−9)	22	36.7%
(+10)	20	33.3%
Total	60	100%

Table 6. Distribution of number of patients per day

No. of patients per day	Number	%
(1−3)	34	56.7%
(4−6)	12	20%
(+ 7)	14	23.3%
Total	60	100%

part included demographic questions regarding age, sex, work duration, and acquired specialization. Part two dealt with working conditions (working posture, working with or without an assistant) and organization of the dentist's work (number of breaks and their purpose), whereas the third part concerned MSDs and prophylactic physical activities (type, effectiveness). MSDs were evaluated with the help of a postural stress questionnaire, titled the Nordic Musculoskeletal Questionnaire. Data collection was performed using a self-questionnaire with items related to socio-demographic characteristics, time in profession, activities performed, work conditions, and work organization. Patients were also asked to fill out a postural discomfort chart to identify the region where they felt the most pain or discomfort. All subjects were given instructions on how to fill out the questionnaire, and an informed consent was obtained from each participant. The questionnaire included subjective information regarding job history, personal characteristics, work physical risk factors, health status in general, and the occurrence of various musculoskeletal complaints. The completed questionnaire was collected on the third day, and the data were used for the statistical analysis.

RESULTS

Sixty subjects, including postgraduate students and staff of the dental college, with an average age of 25.7 years, participated in the study. Descriptive data are presented in (Tables 1–10).

Among the total of 60 subjects, 28 were male and 32 were female dentists. The incidence of LBP among them was 70%. Among the sites of injury, LBP predominated at 47.6%. A severity of injury analysis showed that most subjects (90.5%) had a mild to moderate level of severity and only 9.5% had severe LBP. Number of years of work in the same field data showed that an almost equal amount of subjects were distributed across the range of 1 to more than 10 years of experience, indicating that the incidence of back pain did not correlate with years of experience, and any dentists who are not maintaining normal posture are vulnerable to develop back pain. Most of the dentists (57%) were treating 1–3 patients per day, which demonstrates that the number of patients treated and number of hours worked per day did not correlate with the incidence of back pain. Few dentists (17%) exercised during their rest period even though 57% took breaks during their work. Although 63% of the dentists were aware of the advantage of using assistive tools, only 40% were using any kind of assistive devices.

DISCUSSION

The current study of 60 dentists was conducted to determine the prevalence of and risk factors for LBP. Among the 60 subjects, 70% complained of mild to moderately intense LBP. These results indicate that the prevalence of back pain is very high among dentists. This finding could be due to the altered working posture required for dentists to reach the oral cavity and is supported by earlier studies that demonstrated that dentists are highly predisposed to LBP[8].

In the current study, when complaints of pain were analyzed by region of the body, 47.6% of subjects complained

Table 7. Distribution of having a rest period

Rest period	Number	%
Yes	34	56.7%
No	26	43.3%
Total	60	100%

Table 8. Distribution of exercising during the rest period

Exercise	Number	%
Yes	10	16.7%
No	50	83.3%
Total	60	100%

Table 9. Distribution of use of assistive tools

Assistive tools	Number	%
Yes	24	40%
No	36	60%
Total	60	100%

Table 10. Distribution of awareness of assistive tools to reduce back pain

Decrease back pain	Number	%
Yes	38	63.3%
No	22	36.3%
Total	60	100%

of LBP. This finding contradicts the results of a previous study that found that dentists suffer from neck pain rather than back pain due to their unhealthy positions.

A study by concluded that 57% of the dentists surveyed suffered from LBP. They also found that LBP was most frequent in the age group of 30 to 40 years. A possible cause for work-related LBP among dentists could be the imbalance in muscles between the lower back and abdominal muscles that occurs in the sitting posture of the dental profession. Repeated leaning towards the patient may lead to strain and overexertion in the lower back extensor muscles while at the same time, the deep abdominal muscles of stabilization become weaker. Studies show that if the transverse abdominis muscle is strong, the level of back pain will decrease[9].

In the current study, 90.5% of subjects complained of mild to moderately intense LBP, and only 9.5% complained of severe LBP. We assume that this could be the reason why most dentists do not seek consultation with an orthopedic surgeon or physical therapist for their back problems[10].

When the data were analyzed for the number of years of work in the same field, an almost equal number of subjects were distributed across the range of 1 to more than 10 years of experience. This suggests that the incidence of back pain does not correlate with years of experience and that any dentists who are not maintaining a normal working posture are vulnerable to develop back pain. The appearance of musculoskeletal symptoms among dental professionals is quite common. It has been suggested that ergonomics should be covered in the dental educational curriculum to reduce the risk of injury to dental practitioners[11].

Most of the dentists (57%) in our study were treating 1–3 patients per day, which indicates that the incidence of back pain does not correlate with the number of patients treated or number of hours worked per day. Only a few dentists (17%) exercised during their rest time even though 57% of them took breaks during their working period. This is a major concern in regard to the high incidence of "work-related musculoskeletal disorders" WMSDs among dentists[12]. It is the role of an ergonomist or physical therapist to teach an appropriate set of relaxation and stretching exercises to dentists in order to avoid or reduce the occurrence of WMSDs among dentists[13]. In our study, pain was most commonly reported in the shoulder, neck, and back. Physical workload is an important factor in MSDs. The impact of MSDs on the work and life of dentists demonstrates the need for increased knowledge of MSDs and the initiation of preventive strategies[14].

The current study also revealed that even though 63% of the subjects were aware of the advantage of using assistive tools, only 40% were using any kind of assistive devices. This issue also needs to be addressed by ergonomists or physical therapists. By promoting awareness of the value of using available assistive devices, the rate of musculoskeletal disorders could be reduced. In dental professionals, the risk of developing WMSDs could be reduced through a combination of prevention, ergonomic guidance, and specialized therapeutic interventions[15]. Prevention of WMSDs consists of early symptom identification, analysis of working posture and activity, and evaluation of equipment (such as dental instruments, position of the dental unit, patient and operator chairs, and lighting). When WMSDs occur, physical therapy treatments are recommended. In previous studies found that Pain was significantly prevalent among the group who worked in direct vision, without an assistant, in a standing position, or who did not following a fitness regimen[16, 17].

Dentists are able to recognize and identify their own postures and equipment usage patterns that lead to high risks for musculoskeletal pain, especially LBP. Such recognition is the first critical step to neutralize non-ergonomic behavior and reduce risks to dental practitioners[18]. The present data indicate that prophylactic and therapeutic measures should be encouraged to prevent cervical and back pain in this affected occupational group[19–21]. The results of the present study support previous findings that improvements in functional parameters and increase in work productivity occurred in dentists who received physical therapy[22, 23]. However, the prevalence of WMSDs among dental professionals is high[24–26].

This study concludes that dental professionals have a high prevalence of LBP, and the symptoms of LBP increased with the number of years in practice. To minimize the risk of WMSDs among dentists, work postures need to be improved. The physical therapist's role is vital, and the practice

of relaxation and stretching exercises during breaks in the dentists' work schedules is mandatory.

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