

Postural awareness among dental students in Jizan, Saudi Arabia

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Abstract

Objective: The study was conducted to assess the postural awareness of dental students in Jizan, Saudi Arabia. **Materials and Methods:** Close-ended, self-administered questionnaires were used for data collection in the survey. The questionnaire was prepared by observing the positions of students working in the clinics and the common mistakes they make with regard to their postures. The questionnaires were distributed among the dental students who were present and reported to work in the clinics. Levels of postural awareness and the relationship between postural awareness and the degree of musculoskeletal disorder (MSD) among the students was evaluated. This study was carried out in the College of Dental Sciences and Hospital, Jizan. **Statistical Analysis:** The level of knowledge of postural awareness was evaluated and correlated with the presence or absence of the MSDs. Categorical variables were compared using Chi-square test. *P* values of less than 0.05 were considered statistically significant. **Results:** A total of 162 dental students from the age group of 20–25 years were included in the survey, of which 134 dentists responded (83%). When their postural awareness was evaluated, results showed that 89% of the students had poor-to-medium levels of postural awareness. The relation between postural awareness and prevalence of MSDs indicated that 75% of the students with poor awareness, 49% of the students with average awareness, and 40% of the students with good awareness have MSDs. The results were statistically significant (0.002127, which is <0.005) stating that better awareness about proper postures while working helps to minimize the risk of MSDs. **Conclusion:** Evaluation of levels of postural awareness showed that 21% of the students had poor postural awareness, 67% had average awareness, and 11% had good postural awareness. The analysis of results showed that those students with low-to-average postural awareness had significantly greater prevalence of MSDs.

Key words: Cervico-acromial pains, dental students, ergonomics, musculoskeletal disorders, posture

INTRODUCTION

Dental professionals commonly experience musculoskeletal pain during the course of their careers that may even cause a career-ending disability.^[1] Dentists often assume static positions that are uncomfortable and asymmetric.^[2] Historically, researchers have established that back pain is one of the most common problems among dental personnel.^[3]

Prolonged shoulder flexion and upper arm abduction as well as high static muscle activity levels during common dental tasks were considered major factors leading to neck and shoulder discomfort.^[4] Neck discopathy results in cervical pains or cervico-acromial pains, which are particularly common among dental practitioners.^[5,6] Movements such as craning, excessive bending and twisting of neck, bending forward from the

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waist, elevation of the shoulders, and general bending and twisting of neck and back are the common postural faults in dentists [Figure 1].

Some symptoms of musculoskeletal disorders (MSDs) are as follows^[7-9]: Excessive fatigue in the shoulders and neck; tingling, burning, or other pain in arms; weak grip; cramping of hands; numbness in fingers and hands; clumsiness and dropping of objects; and hypersensitivity in hands and fingers. Median nerve and cubital nerve defects are seen in a number of dentists due to defective ergonomics.

Some signs of MSDs are as follows: Decreased range of motion, loss of normal sensation, decreased grip strength, loss of normal movement, loss of co-ordination, etc.

MATERIALS AND METHODS

The survey with close-ended, self-administered questionnaires that focused on various positions while working was used as the data collection method. The questionnaire was prepared by us keeping in mind the various faulty positions of students working in the dental clinics and was aimed at drawing their attention to their strained positions that can potentially cause MSDs.

The questions were designed such that they evaluated the level of postural awareness by eliciting the details

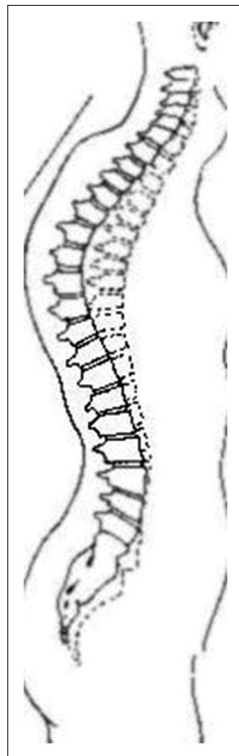


Figure 1: Spine curvature

of the body posture of the dentist, the manner of working (without rest or with short breaks), and the presence or absence of MSDs. Using the convenience sampling, the questionnaires were distributed to all the 162 male and female dental students present and working in the student clinics of the College of Dental Sciences Hospital, Jizan. All the students were aged between 20 years and 25 years. Among the 162 students, 134 (83%) responded.

Statistical analysis

The resultant data were subjected to statistical analysis. The level of knowledge of postural awareness was assessed and correlated with the presence or absence of MSDs. The categorical variables were compared using Chi-square test. *P* values of less than 0.05 were considered statistically significant.

RESULTS

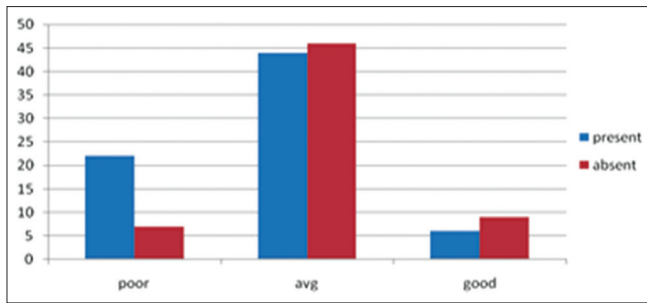
A total of 162 dental students were given the questionnaire but only 134 responded and participated in the study giving a response rate of 83%. Of the 134 dental students who responded, 21.6% (29) had poor postural awareness (with a score less than 5), 67.16% (90) had average postural awareness (score of 5–7), and only 11.19% (15) had good postural awareness (score 8–10). About 45.5% participants were males and 54.5% were females. When the postural awareness was compared between male and female dental students, the *P* value was statistically insignificant (*P* = 0.18, i.e. >0.05) stating that postural awareness did not have any influence on the gender of the dentists [Table 1].

The relationship between postural awareness and the degree of MSD among the students was evaluated, and the results are significant (0.02127, i.e. <0.05) implying that better awareness about the proper posture while working helps to eliminate the risk of MSDs [Graph 1]. Eighteen percent of the surveyed dentists said they exercise regularly to prevent MSD and nearly 58% of the dentists with MSDs neglect and do not exercise regularly.

Table 1: Relationship between postural awareness levels and musculoskeletal disorder

| Level of postural awareness | Poor (%) | Average (%) | Good (%) |
|---------------------------------------|------------|-------------|------------|
| Number and percentage of students | 29 (21.6) | 90 (67.16) | 15 (11.19) |
| Presence of musculoskeletal disorders | 22 (75.86) | 44 (48.88) | 6 (40) |

Chi-square test=7.7, P value=0.02127 (significant)



Graph 1: Graphic representation between postural awareness and musculoskeletal problems

As many as 32% of the respondents claim that they are not suffering from any MSDs and thus do not require any kind of exercise. Some of dental students (67.16%) answered that they follow sitting dentistry most of the time and while working in the sitting posture, they bend forward slightly and work. They keep only the front portion of the foot touching the floor. They also responded saying that their backbone is never supported by the back of the sitting chair. All respondents said that they have no custom-made chair, but use the dental stool provided by the manufacturer. All of these responses strongly support that the awkward and static posture is the biggest risk factor for the MSDs.

DISCUSSION

Ergonomics is an applied science concerned with designing products and procedures for maximum efficiency and safety. According to Bethany Vallachi and others, dentists frequently assume static postures, which require more than 50% of the body's muscles to contract to hold the body motionless during longer breaks.^[19] Body strengthening exercises have been described by Valachi and Valachi, in 2003.

Postural awareness techniques are follows: Tilt the seat angle slightly forward up to 15° to increase the low back curve. Use a saddle-style operator stool that promotes the natural low back curve. Adjust the chair so that your hips are slightly higher than your knees and distribute your weight evenly by placing your feet firmly on the floor. Adjust the operator chair properly, adjust your chair first.

Lifestyle changes required^[10-12] are as follows: The vast body of literature supports the idea that workers should vary their work positions as often as possible to shift the workload from one group of muscles to another and adapt to the dynamic postures.

Aerobic exercises

Aerobic exercises as the name suggest concentrates more on improving oxygen transport by increasing blood flow to the tissues and thereby increasing their efficiency. Since the velocity of the blood flows increases they also wash out blood triglycerides. The exercise program should contain warm-up, exercise period, and cool down. Finsen *et al.*^[13] suggested that an increased variation in work postures may reduce the risk of overloaded spine and lower and upper limbs. A study by Heuch *et al.*^[14] on dental students in Norway reported that a high body mass index was significantly associated with an increased prevalence of low back pain. Åkesson *et al.*^[15] observed that the work posture of dentists plays an important role as a risk factor for the development of work-related disorders. Therefore, postural awareness and lifestyle changes are essential for dentists. Postural awareness among dentists has been observed to be average according to some studies.^[16-18] The American Dental Association (ADA) has given valuable tips to improve the posture and reduce muscle fatigue in a clinical environment.^[19] The general agreement is to schedule patients so that you alternate between long, difficult cases and short, easier cases and use a surgical magnification system when necessary. It should allow for a comfortable posture while maintaining a close view of the task at hand. Adapt the lifestyle changes required for a healthy dental practice.

CONCLUSION

A majority of the surveyed dentists had average-to-poor postural awareness.

A significant association was detected between postural awareness and MSDs.

This study showed that those students with better postural awareness had reduced incidence of MSDs thus emphasizing the need for training programs aimed at increasing the awareness and knowledge of ergonomics.

Drawback of the study

The sample size in this study is small and further research with larger sample size and a more elaborate questionnaire will be helpful in understanding the dentists' requirements. This will enable the planning and execution of appropriate training programs to prevent and overcome MSDs due to dental practice.

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Conflicts of interest

There are no conflicts of interest.

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Questionnaire on postural awareness in dental students

1. Have you ever experienced neck, finger, shoulder, back, or any other muscular pain related to your work in the dental clinic?
(a) Yes, (b) no
2. Do you practice
(a) Sitting dentistry, (b) standing dentistry, (c) both
3. Which type of operating stool do you use?
(a) Custom made, (b) manufacturer supply, (c) ergonomic saddle type
4. Is your lower back supported by the back of the stool?
(a) Yes, (b) no
5. What is the position of your head while working?
(a) Straight, (b) bent forward and tilted, (c) bent forward
6. What is the position of your elbow while working?
(a) At the shoulder level, (b) above the shoulder level, (c) below the shoulder level
7. What is the position of your feet while working?
(a) Flat on the floor, (b) toes touching the floor, (c) feet on the legs of the stool
8. What is your seat position when you are working on the patient?
(a) Straight, (b) tilted slightly forward
9. At what level are the hips compared to the knees?
(a) Higher, (b) lower, (c) same level
10. Do you work in the same position or change positions?
(a) Single position, (b) change positions