ERGONOMICS: A Must for Dentistry: A Cross Sectional study in various parts of Northern India

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Abstract

Objective: To identify the ergonomic factors causing various health hazards in among dentists practicing in Northern India.

Materials and methods: A cross sectional study was carried out among the dentists practicing in various parts of Northern India. Convenience sample of 1000 dentists who met the inclusion criteria was taken and those who agreed to participate. Data collection was done by the means of structured questionnaire for ergonomic factors. The variables evaluated were a) Gender b)Age c)Awareness d) Relaxation while working e)Work environment f)Presence of pain g) eye related problems due to adoption of inadequate posture h)measures taken to prevent the injury or pain

Results: The results of the study shows that 65.1% samples corresponded to females and 34.9 samples were males. 85% reported muscular pain due to the clinical practice and rest 15% did not report any kind of pain.

Conclusion: Ergonomics related health hazards are a common affliction in dentists which begins at the time they start their professional studies and it stays with them during their professional practice affecting various parts of the body.

Key words: Ergonomics, dentists, health hazards

Introduction

Dentistry is a profession which can produce various health hazards among dentists. However until recently very few would classify their profession as hazardous. It is also a job of social interaction between helper and the recipient in a limited job setting with personal characteristics. A healthy dentist is one of the most important components in a successful dental practice. Thus ergonomics became popular in all the fields including dentistry.

WHO defined occupational health as a multidisciplinary activity which promotes and protects the workers health. This discipline also seeks to control accidents and diseases through reduction of risks.

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The successful application of ergonomics assures high productivity and avoidance of illness and injuries as well as increased satisfaction among workers while unsuccessful application on the other hand leads to various health hazards.

It is necessary to maintain an adequate work posture and that the instruments and furniture that the dentist is working with have adequate working characteristics.\textsuperscript{14}

Several studies shows relationship between inadequate posture while doing clinical practice and appearance of pain in the various muscles of the body.\textsuperscript{3}

Antonio j et al found that dentists are prone to the lesions of the skeletal muscle system due to the clinical exercise of the profession of which muscle pain in the back is most common followed by neck, shoulders and hand.\textsuperscript{9}

Valachi et al also proved a correlation between the presence of pain and specific forced postures: torsion of the trunk, moving of the shoulders towards the side, elevating the elbows, operating light too far away from the line of vision when working on the maxillary arch, working with hands close to the patients face and working for a long period of time.\textsuperscript{4}

Unthank M showed in his study that Lighting at the work place: the lack or excess of light can generate myopia and irreversible retinal lesions, among others.\textsuperscript{13}

Aim of this study is to find the correlation of the ergonomic factors and its association with age, gender, and work environment eye related problems due to wrong postures and measures taken for prevention so as to promote a healthy professional and personal life during the professional practice.

Materials and Methods

A cross sectional questionnaire study was carried out with total no of 1030 practicing dentists doing general or specialized practice in various parts of north India. Out of 1030 participants 11 refused to participate whereas rest 19 did not meet the inclusion criteria. Verbal informed consent was taken.

A pilot study was also done on a group of 15 randomly selected dentists of Jaipur Dental College before the questionnaire was finalized. The self administered questionnaire was personally taken to the respective persons. The questionnaire was requested to be filled there itself to avoid bias and then it was tested to check its clarity and validity. Questions which were found to be irrelevant were removed and those questions which were in comprehensive were modified.

Inclusion criteria:

a. All participants should be registered to their specific state council

b. General as well as specialized practitioners were included in the study

c. All the PG students doing PG in various branches of dentistry were included

Exclusion criteria: a. subjects suffering from any kind of medical problems (arthritis, fracture etc) were not included in the study

The variables included in the study were a) Gender b)Age c)Awareness d) Relaxation while working e)Work environment f)Presence of pain g) eye related problems due to adoption of inadequate posture h)measures taken to prevent the injury or pain

A closed questionnaire was given to the candidates who participated in the study. The questionnaire consisted of 48 questions with multiple choices. After the questionnaire was filled up it was collected back. The results were presented by a simple bar graph. A Chi- square test with 95% of probability and 0.5% margin error was done to establish differences when relating two qualitative variables and, to find out if there was statistical significance or were due to chance.

Results

In the present study the prevalence of various health hazards among dentists practicing in various parts of Northern India was interpreted. A total of 1030 dentists were surveyed. One thousand and thirty questionnaire were taken to dentists out of whom 1000 were filled with a response rate of 97.08. Thirty questionnaire were not filled as 11 respondents refused saying that
they were not interested to participate in the study and 19 did not meet the inclusion criteria. Out of 1000, 651 were females and 349 were males.

**Gender:** According to the study 65.1% samples corresponded to females and 34.9 samples were males (Graph 1) i.e. 651 were females and 349 were males out of 1000 samples who responded to the questionnaire.

**Age:** 500 of the population were between 26-40 yrs of age where as 288 were between 21-25 yrs, 177 between 41-55 yrs where as 35 dentists were between 56-70 years (Graph 1).

**Awareness:** In our study 67.7% of the total population was not aware of the term ergonomics whereas 32.3% population were aware of the term ergonomics. (Graph 2) Out of total of 1000 study population 323 were aware of the term ergonomics.

**Relaxation while working:** Present study shows 60% ie 600 out of 1000 dentists responded that they relax while working i.e. they take short breaks between appointments whereas 40% or 400 of the study population worked without taking breaks. (Graph 3)

**Work environment:** Our study shows 900 or 90% of the dentists said that their working environment was healthy while 100 or 10% replied that the working environment was stressful. (Graph 4)

**Presence of pain:** According to the study 85% or 850 dentists reported muscular pain due to the clinical practice and rest 15% or 150 dentists did not report any kind of pain. (Graph 5)
Stress in eyes: In the present study 60% or 600 dentists felt stress in their eyes due to clinical practice while 40% or 400 said no. (Graph 6)

![Graph 6](image)

Graph 6
Spectacles due to clinical practice: According to the study 30% or 300 subjects said that they started wearing spectacles after they initiated their clinical practice while 70% or 700 subjects said that they do not have to wear spectacles. (Graph 7)

Graph 7

Discussion
The present study was conducted with the aim to assess the prevalence of various health hazards amongst dentists practicing in various parts of Northern India and to know the contributing factors for the disorder. Out of total of 1030 dentists 1000 responded to the questionnaire. The response rate being 97.08%. The response received in the present study was high as the questionnaire was personally taken to the dentists and were not mailed or posted as in the study performed by Dawid W Rising.  

An analysis of the results showed that 85% of the dentists have experienced any kind of pain during their clinical practice. This figure is very high and a subject of worry for current and future dentists. This supports the study done in 1996 by Anita M Unruh.  

Sim, Lacey and Lewis in 2006 established that there is a positive relationship between rigid postures and muscular skeletal disorders in different professions which could include pain, weakness, and paresthesia, this is widely documented and studied for a large number of professions. This study is in agreement with the results presented since a positive relationship was also found between muscular pain and inadequate postures in the subjects who participated in this study, but in contrast with the results of the authors already mentioned, this study only established this relationship for the dental profession.

Lindfors et al. in 2006 reported that the female group of dentists showed a higher incidence of muscular skeletal disorders; our study showed that the presence of pain was more frequent in females with 78% while in males was only 43%. Our study also supports the fact that there is a correlation between stress felt in the eyes due to the wrong postures adopted in order to gain appropriate vision of the working field as well as some of the dentists reported that they have started wearing spectacles due to their clinical practice.

Conclusion
Ergonomics related health hazards is a common affliction in dentists which begins at the time they start their professional studies and it stays with them during their professional practice affecting various parts of the body. The results of this study show that adopting inadequate postures to gain better vision of the oral cavity, could produce muscular pain as well as eye related problems. It was also concluded in the study that the female population were at a higher risk. Adopting adequate postures in clinical practice and having a favourable work environment could reduce the frequency of lesions to the muscular skeletal system avoiding an early retirement from the profession. Therefore, it is of vital importance to promote occupational health training and prevention programs regarding ergonomic postures which must be acquired by the dentists.
during their clinical practices, originating in this manner, healthy lifestyles.

References
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