

Awareness about Ergonomic Practice among Dental Professionals in Chennai City-A Cross-Sectional Study

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Abstract: Dentistry has become an integral part in health sector. It is necessary to maintain a good quality health of the dental professional by practicing ergonomics in a good manner which prevents them from musculoskeletal disorders. The purpose of this study was to assess the awareness about proper ergonomic practices and its implication among practicing dental professionals in Chennai city. Self-administered, closed-ended questionnaire assessing knowledge, attitude, and practices regarding ergonomics during dental practice was filled in by undergraduates, house surgeons and faculty members of dental institutions and private practitioners from Chennai city. Out of 150 practicing dentist, 96 dentist (64%) were aware about ergonomics and its implication in dental office. Only 44 dentists (29.3%) were following ergonomics in their routine dental practice. There was a good knowledge about ergonomics among dentist, but internalization and following it in their regular practice was average. Several posture related pain and musculoskeletal disorders can be reduced by practicing ergonomics routinely in clinical practice.

Keywords: Dentistry, dental, practices, Chennai.

INTRODUCTION

Among the various reasons attributed to burnout among health professionals, musculoskeletal disorder (MSD) constitutes to a major reason for loss of productivity. In health sector, literature reveals that nearly 64% to 93% of the General Surgeons and dental professionals are affected by MSD. Among the two, the latter are at higher risk, as they often cannot avoid prolonged static postures.

In dentists, overstrained and awkward back postures for back pain, repetitiveness for neck and shoulder disorders, and psychosocial stressors for back, neck and shoulder complaints [1]. It is well known that dental practitioners are predisposed to a number of different occupational perils during the course of their professional work [2]. Musculoskeletal disorder (MSD) can affect the body's muscle, joints, tendons, ligaments, and nerves. They are caused by work itself or by working environment [3]. Even in optimal seated postures, more than one-half of the muscles of the body are contracted statically and there is little movement of vertebral joints. This may result in damaging physiological changes leading to back, neck or shoulder pain, resulting in MSD. If regularly occurring pain or discomfort is ignored the cumulative physiological damage can lead to carrier-ending disability [4].

The most prevalent regions for pain in dentists have been shown to be the back (36.3-60.1%) and neck

(19.8-85%), while the hand and wrist regions were the most prevalent regions for dental hygienists [5]. In earlier days most dental procedures were performed while standing. Standing for long hours while performing dental work is not easy on the body. They reported significant lower back, leg and feet pain.

Development of the sitting position in dentistry was an attempt to eliminate discomfort and fatigue. Dental work is often hampered by well-known ergonomic risk factors, like longlasting static work in awkward postures [6]. Holding a static awkward posture for long periods can lead to chronic muscular fatigue, discomfort or pain. Even worse, continual static loading on muscles and joints may result in adaptive alterations in the normal structures of soft tissues, such as shortening or other pathological effects [7]. Unfortunately, the seated working position did not reduced MSDs, even though many specialized chairs and office designs are available [8]. Evidence shows

that alternating between sittings and standing positions to deliver care is best practice and to maintain a good health.

The application of ergonomics goes beyond industrial sector and finds multiple utility in health sector. The discipline of ergonomics has attempted to make important changes over by introducing human centered processes to design of equipment, systems and working practices in dentistry. The application of ergonomics in dentistry would enhance optimum access, discernibility, relief and control in clinical practice [9]. By up taking the principles of ergonomics, quality health of the dental professionals can be maintained.

According to revised syllabus and regulations by Dental Council of India (DCI) in 2007 awareness about musculoskeletal disorder and improper working postures have been included in the text books to create awareness among dental students. Since there has been a decade after the introduction of this revised curriculum, it provides an opportunity to study the knowledge of the graduated dentist regarding the concepts and practice of ergonomics in their daily practice.

With this background this study was aimed to assess the knowledge, attitude and practice of ergonomics among dental professionals in Chennai city.

MATERIALS AND METHODS

This was a cross sectional study with a convenience sampling design. 150 practicing dentists were selected from Chennai city. The study participants were asked to fill a predesigned questionnaire. The questionnaire was close ended. The items for the questionnaire were collected from other studies which were valid and reliable.

The questionnaire consisting of 18 items assessed the knowledge, attitude, and practices regarding ergonomics in dental practice, in addition to some questions related to sociodemographic data, their work hours per day and whether they practiced any physical exercise. Knowledge was assessed by focusing on principles of ergonomics in routine dental procedures. The validity of the questionnaire was determined by carrying out a pilot study among 10 subjects and necessary modification was done before the commencement of the final study. The questionnaire were self-administered by a single investigator who met all the practicing dentist individually at their work place, explained them the purpose of the study and completed the questionnaire after getting their consent. The study was commenced after the approval of the institutional ethics committee of this institution.

The participants took around 15 minutes to complete the questionnaire. The study was conducted between December 2017 to March 2018.

STATISTICAL ANALYSIS

Statistical analysis of the data was performed using SPSS for Microsoft Windows, version 20. Descriptive statistical data were tabulated and summarized in terms of frequency distribution and percentage. Chi square test was used to assess the association between various predictors and the presence of self-reported MSD among the study population. The level of significance for all analysis was set as 0.05.

RESULTS

Among the total of 150 participants, 100 of them (66.6%) were less than or equal to 30 years old. Nearly two thirds of the participants 96 (63.3%) were females. Most of the participants 59 (38.8%) were having working experience of less than 3 years. Nearly, two thirds of the participants (102 (68%)) used to work for 4-8 hours per day (Table 1).

Table-1: Demographic details of the participants

DEMOGRAPHICS	COUNT
AGE	
Less than & equal to 30yrs	100 (66.6%)
More than 30yrs	50 (33.4%)
GENDER	
Male	44 (36.7%)
Female	96 (63.3%)
WORKING EXPERIENCE	
Less than 3years	59 (38.8%)
3-10yrs of experience	49 (32.6%)
More than 10yrs	42 (28.6%)
WORKING TIME IN CLINIC (Hours)	
Less than 4hrs	9 (5.2%)
4-8hrs of working	40 (27.1%)
More than 8 hrs	101 (67.7%)

Among the total participants, 93 (62%) did not do any physical exercise outside their work. Most of the participants did not have any medical problem. Out of total participants, 83 (55.3%) experienced posture related pain while working in dental chair and among them 44 (29.3%) experienced sharp momentary pain while working.

With regard to knowledge regarding ergonomics, more than two thirds of the participants were aware of the terminology and principles, though

only 59 (39.80%) followed these principles in their routine dental practice.

Also, nearly 84% of participants preferred working in the upright position and the spine resting on the back of the stool, and most of the participants 110 (73.70%) never use magnification aids in their routine practices.

Most of the participants (64.20%) were using four hand dentistry with adequate illumination in their clinics (Table 2).

Table-2: Knowledge & attitude about ergonomics among participants

Awareness regarding physical exercise	
Yes	97 (64.70%)
No	53 (35.30%)
Posture related pain while working	
Yes	83 (55.3%)
No	67 (44.7%)
Type and nature of pain	
Sharp momentary pain	44 (29.3%)
Dull aching pain (Occasionally)	39 (26%)
Never	67 (44.7%)
Knowledge about ergonomics	
Yes	96 (64.20%)
No	54 (35.80%)
Following principles of ergonomics	
Yes	59 (39.80%)
No	91 (60.20%)
Working position	
90 ⁰ Upright position	126 (84%)
Bend the back while working	24 (16%)
Use of magnification aids	
Yes	125(73.70%)
No	25 (26.3%)
Four handed dentistry	
Yes	96 (64.20%)
No	44 (35.80%)

There was a significant association between participant's age, use of magnification aids with posture related pain and intensity in routine dental clinic practices ($p < 0.005$). There was no association between gender, type of practices, habit of exercise and knowledge about ergonomics.

DISCUSSION

Ergonomics has been always neglected, from both knowledge and practice point of view during clinical work. Musculoskeletal disorder is a major problem recognized among dental professionals affecting their competence and job fulfillment. The main cause for this may be attributed to unsuitable workplace ergonomics including long working hours and wrong postures. In this study, two thirds of the participants (68%) were used to work for 4-8 hours per day and many did not do any physical exercise outside their work. Similar findings were reported in the study

conducted by Brown *et al.* [10] who stated many of the ill health retirees could have been retained in the dental workforce with better support or opportunities for more flexible working. This study revealed that nearly two third of the participants had fair knowledge about ergonomics. This was in agreement with other studies done by Garbin *et al.* [11], Bârlean *et al.* [12], and Madaan and Chaudhari [13]. El-sallamy *et al.* [14]. In the current study, most of the participants (64%) had positive attitudes towards ergonomics. Unfortunately, this did not result in following the principles of ergonomics in clinical practices, similar to the findings of the study conducted by El-sallamy *et al.* [14]. Compared to the attitude scores, the practice scores in the current study were low. There were a significant association between knowledge and attitude, and also knowledge and practice, but no association between attitude and practice. This was in agreement with another study done by Karibasappa *et al.* [15]. They

observed that though dental students had sufficient knowledge, attitude regarding the importance of proper working postures, and position during providing treatment, they did not result in the desired behavior.

Kalghatgi *et al.* [16] also reported positive significant correlation of knowledge with attitude regarding MSDs, but a negative significant correlation between knowledge and practices, reiterating the fact that knowledge always does not get translated into practice.

In this study, there was no significant association between gender of the professionals and their level of knowledge or attitude and practice. This was in disagreement with another study done by Kritika *et al.* [17] where females were more prone for musculoskeletal disorders than males and hence they were more interested to obtain more knowledge regarding ergonomics.

Nearly 84% of dental professional reported that they worked in the upright position and the spine resting on the back of the stool, unlike the study done by Mohammed and Al-Zain [18] which claimed that 43% of the dental students worked with a bent spine making them prone to MSDs.

CONCLUSION

Overall findings of the study stated that, 64% dentist had positive attitudes towards ergonomics but only 29.3% were following the principles of ergonomics in dental clinics. The acquisition of ergonomic knowledge can occur at any time; however, early assimilation of knowledge and internalization of dental ergonomic principles might prevent their suffering from work-related musculoskeletal disorders. Oral health professionals need to emphasize on practicing ergonomics in their routine dental practice to avoid major ergonomics-related health problems.

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