

Assessing the knowledge, attitude and practice of ergonomics among dental practitioners of Madurai city

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Abstract

Dentists are at a greater risk of work-related musculoskeletal disorders than general population. Factors responsible for work-related musculoskeletal disorders in dental healthcare workers include repetitive/unnatural movements and posture. These problems can be avoided by increasing awareness of the postures used during work, redesigning the workstation to promote neutral position following healthy work practices. This study was aimed to assess the effectiveness of health education tool in increasing the Knowledge, Attitude and Practice amongst dental practitioners.

It is an Interventional Study to assess Knowledge, Attitude and Practice of ergonomics amongst dentists before and after using a Health education tool. Dentists who met inclusion criteria (n=103) were assessed about Knowledge, attitude and practice of ergonomics through a validated, Self-Administered questionnaire and health education was given to all the participants by Power Point presentation and Pamphlets. After the intervention, the questionnaire was completed by the participants. Chi-

Square test and Mann-Whitney U test were used for statistical analysis at a significance level of 0.05

At the end of the study, the change of scores in the knowledge, among dentist was statistically significant ($P < 0.05$) change in the attitude and practice of ergonomics was not statistically significant.

Educational Intervention lead to change in the score of knowledge of dentists about ergonomics which was statistically significant (0.002) but the attitude and practice of ergonomics did not show any significant improvement.

Keywords: Ergonomics, Effectiveness, Health education tool, Musculoskeletal disorders

Introduction

Dentistry is one of the noble professions which requires higher degree of dexterity and precision. Dentists are more concerned and are occupied about patients' comfort and probably pay a very little attention to their own. It has been estimated that 54% to 93 % of dentist suffer from Musculoskeletal disorders.¹

Musculoskeletal disorders are a wide range of inflammatory and degenerative disorders of muscles,

tendons, and nerves. Musculoskeletal disorders (MSDs) are among the most common causes of long-term disability. Due to spiraling incidences of MSDs over a period of time and their subsequent impact on industrial profits and quality of individual lives, the MSDs have received considerable attention since 1990s from ergonomists.

Ergonomics is a study of the relationship among the personnel, equipment and environment in the work area.³ Recently, “Ergonomics” has become a popular term.⁴ Good ergonomic design of the workplace is a basic requirement for improving musculoskeletal health.² Factors responsible for work related musculoskeletal disorders in dental healthcare workers include repetitive and/or unnatural movements and posture.⁵

These physical demands when exceed the normal capacity of function, lead to symptoms of muscle fatigue, pain and deformity. These potential problems if left ignored could severely affect the functionality of a clinician.⁶ Literature suggests increase in the prevalence of various ergonomics related disorders among dentists but there is lack of information related to knowledge, attitude and practice regarding ergonomics in routine dental practice in Indian scenario , the present study aimed at assessing dental practitioners knowledge, attitude and practice of ergonomics and educating them to improve their knowledge, attitude and practice of ergonomics.⁷

Materials and methods

It is an Interventional study conducted among registered dental practitioners across private dental clinics in Madurai city. Ethical clearance was obtained from the Institutional Review Board and permission to conduct the study in private dental clinics was obtained. Informed

consent was obtained from the Participants before the start of the study.

Inclusion criteria are dentists who are registered under State Dental council of India and Dentists who are willing to participate in the study. The exclusion criteria are Dentists who are not registered under Dental council of India and Dentists who are not willing to participate in the study.

The pilot study was conducted for a period of one week in the month of July 2016. After analysis of the research and after making necessary changes in the questionnaire, the main survey was conducted in the month of July 2016 - August 2016.

A 24 item, anonymous questionnaire was used to collect data from the study subjects. The questionnaire consisted of demographic information which includes name, age, gender, qualification, specialty of practice, years of clinical practice, phone number and address. The questionnaire consisted of 20 questions which were based on knowledge, attitude and practices of ergonomics among dentist. A Pilot study was conducted on 10 dental practitioners. The questionnaire was tested for validity and reliability in the pilot test.

Health education to the dentist comprised of Phamplets and Power point presentation which contained ergonomic principles, consequences of poor posture, equipment design in dental clinics and suggestions to improvise ergonomically efficient clinical practice.

Sample size was calculated Based on the data on prevalence of musculoskeletal disorders among dentists (57.5%) reported in an Indian study conducted by Sunita Bhagwat ⁸et al, the sample size for this study was arrived at 94 cases for a confidence level of 95% and power of 90% using the following formula.

$n = t^2 \times p(1-p)$ where $m^2 n$ = required sample size, t = confidence level at 95% (standard value of 1.96), p = prevalence of musculoskeletal disorders among dentists = 0.575, m = margin of error at 10% (power of 90%) = 0.1, $n = 1.962 \times 0.575 \times (1 - 0.575) 0.12 = 3.8416 \times 0.575 \times 0.425 0.01 = 93.9$ rounded off to 94 cases. 94 is the sample size for a confidence level of 95% and power of 90% Accounting for 10 % attrition final sample size is 104.

The results are based upon the data obtained from 104 participants. Descriptive statistics were used to find out the frequency of Dentists answering the different options. Statistical analysis was carried out using SPSS version 22.

Results

Out of 103 dentists majority of the dentists 68.9% were general dentist. In the specialty category 9.7%, 8.7%, 4.9% and 3.9% were periodontist, endodontist, orthodontist and pediatric dentist followed by 2.9% prosthodontist and 1% were oral surgery (Graph 1).

In the present study, majority of the dentist 66% and 17.5% were less than 5 years and 10-15 years followed by 11.7% and 4.9% were 3-10 years and more than 15 years respectively (Graph 2).

35% of dentists practice more than 6 hours a day (Graph 3).

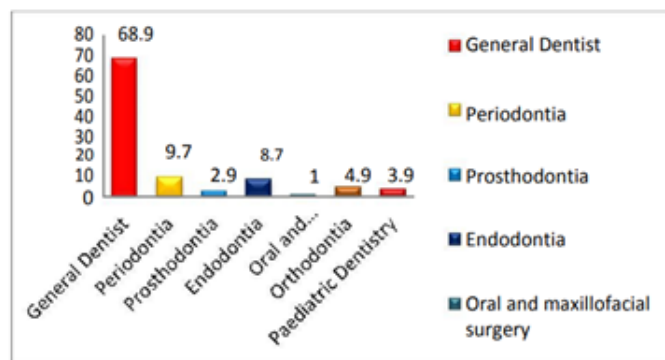
Out of 103 dentists, 35.9% dentists had back pain, 31.1% dentists had low back pain, 17.5% dentists had shoulder pain, 4.9% and 1.9% had head ache and elbow pain followed by 8.7% does not experience any type of pain (Graph 4).

Intensity of musculoskeletal pain on a scale of 0 to 5: Out of 103 dentists, 35% to 26.2% had moderate to moderately severe pain. 18.4% to 10.7% had mild to

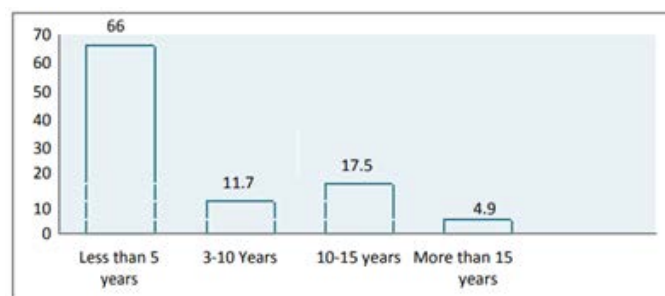
severe pain followed by 8.7% to 1% had no pain and extremely severe pain (Graph 5)

Knowledge, attitude and practice of study subjects at baseline and after intervention: Data analysis for the mean knowledge, attitude and practice of study subjects at baseline and after the intervention. There is an over-time change in knowledge, of study participants. Statistically significant development in knowledge ($p=0.002$). With respect to attitude ($p=1.000$) and practice ($p=0.655$) towards ergonomics no statistically significant results were observed for study subjects at the follow-up. (Table 1)

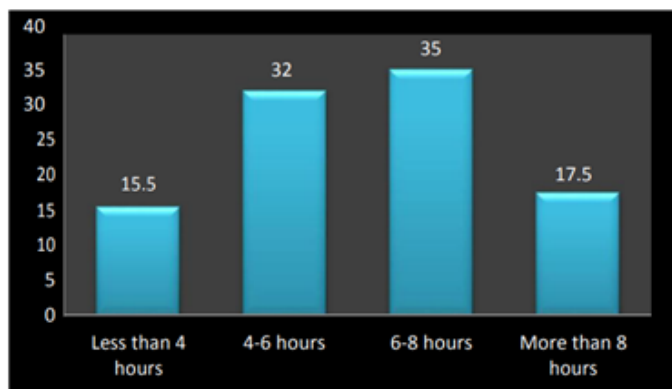
Graph 1: list of primary type of practices



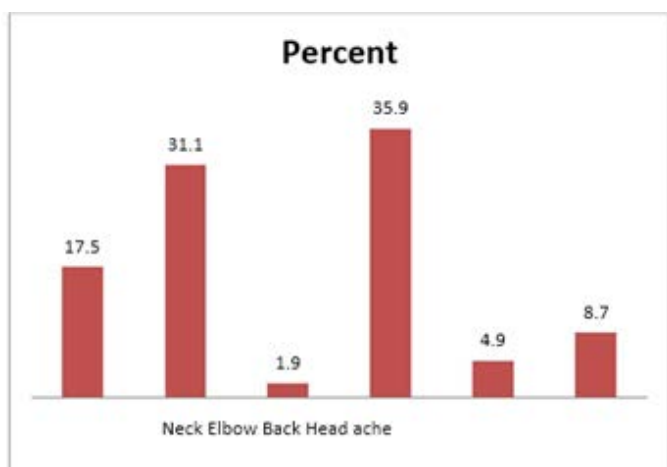
Graph 2: distribution of number of years practised by dentist



Graph 3: no of hours everyday practice by dentist



Graph 4: distribution of dentist based on musculoskeletal pain



Graph 5: distribution of intensity of musculoskeletal pain on a scale of 0 to 5

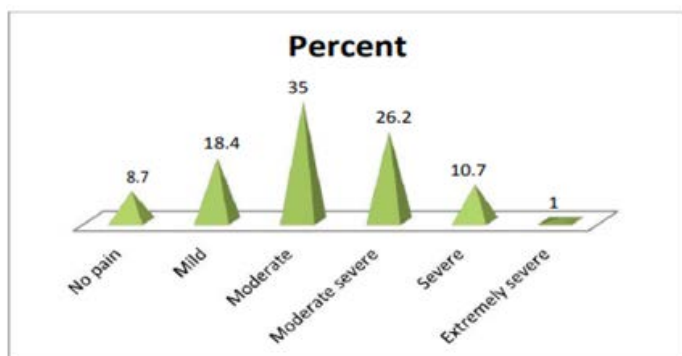


Table 1: mean scores of knowledges, attitude and practice of study population

VARIABLES	PRE (MEAN±SD)	POST (MEAN±SD)	P Value
KNOWLEDGE	65.8333±26.03087	96.0833± 3.98767	0.002*
ATTITUDE	87.0000± 14.14214	87.0000± 14.14214	1.000
PRACTISE	81.2500 ± 14.52297	74.5000 ±10.96966	0.655

*Statistically significant at p <0.05

Discussion

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. The present study was conducted with the aim to assess the effectiveness of a health education tool in assessing the Knowledge, Attitude and Practice of ergonomics among dental practitioners of Madurai city. Majority of the studies ere from North India and very few studies were conducted from this part of the country. To our knowledge, this was the first study to assess the effectiveness of a health education tool with respect to ergonomics in dental practitioners of Madurai, Tamil Nadu. Out of 250 dentists 103 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. The previous descriptive study was conducted by Sareh et al⁹ in 2014 to assess the prevalence and distribution of MSDs among dental practitioners in Pune city in the state of Maharashtra, India. Previous study conducted by Kriangkrai R et al in the year 2017 with a study population of Sixty-eight dental students of Naresuan University, Thailand.¹⁰

Published literature has shown a high prevalence of MSD

among dentists (78.5%). This is similar to a study conducted by Meenakshi S et al (77.5%) in the year 2015 in my sore district.¹¹

Previous studies conducted by Kriangkrai R et al in the year 2017 with a study population of 83.82% and 100% of the dental students reported at least one musculoskeletal pain in the past seven days and twelve months which is very high when compared to the present study.¹⁰ Previous studies conducted by Rama Moorthy A et al in the year 2015 among 500 dental general practitioners in Chennai, India. Musculoskeletal pain with stress (47%) was the most common occupational hazard reported, followed by only stress (27.4%), and only musculoskeletal pain (25.6%).¹² In this study only musculoskeletal pain (25.6%) and which is not in consistent to our present were musculoskeletal pain (78.5%).³³ Previous studies conducted by Mohammed Al Qarni et al¹³ in the year 2016 among 252 dental students in Collage of Dentistry of King Saud University in Riyadh (KSA) in their clinical and non-clinical years. Reported with a prevalence of (68.2%) of WMSDs in one or more body regions which is less compared to our present study because the study is done in clinical and non-clinical students were as in present study it is done in dental practitioners.

The sedentary nature of work together with altered posture and lack of application of ergonomic principles can result in high prevalence of MSD among dentists.¹³ Dentists predispose to pain/injury in different regions of the body depending on the type of work and position adopted. In the present study, the commonly affected areas were back and neck which accounted for 36-31.1%, shoulders 17.5%, headache and elbow 4.9 to 1.9% which were similar to the studies from Queensland and New Zealand, Southern state of AP which showed high

prevalence of MSD among DP regardless of the qualification and specialty, the prevalent site affected was low back and neck.

Previous other studies conducted by Kaul et al¹⁴ in 2012 Bangalore with musculoskeletal pain in lower back pain 51.2% which in consistent with our present study. These results indicate that most of the practitioners adopt positions which frequently result in MSD of neck and low back regions. However, Szymanska¹⁵ and Pureine et al¹⁶, have reported that most relevant musculoskeletal complaint was MSD of low back which could be attributed to forward positioning of the operator to gain access to operating site. The previous descriptive study was conducted by Sareh et al⁹ 2014 Maharashtra, India showed neck trouble to be the most predominant MSDs (69%), followed by shoulder (51%), upper back (51%), and lower back problem (39%) this was in consistent with our present study. Previous studies conducted by Kriangkrai R et al in the year 2017 with dental students of Naresuan University, Thailand. The high prevalence regions included neck (82.35%), upper back (60.29%), right hand and wrist (48.53%), and lower back and right shoulder (each 47.06%) this was also in consistent with our present study.¹⁰ Previous studies conducted by Mohammed Al Qarni et al in the year 2016 among 252 dental students in Collage of Dentistry of King Saud University in Riyadh (KSA) in their clinical and non-clinical years. The neck (83.1%) and lower back (84.7%) were reported to have the highest prevalence of WMSD which is in consistent to the present study.¹³

In the present study, 62.1% of dentists were involved in some kind of rest breaks during their practice. The results were consistent with the studies by Szymanska¹⁶ who discovered that more than 30% of dentists work without breaks. This result was not consistent with a study

conducted by Meenakshi Set al¹¹ were (73.3%) not involved in any kind of break. Previous studies conducted by Rama Moorthy et al¹² in the year 2015 among 500 dental general practitioners in Chennai, India. Only 9.6% of practitioners adopted yoga as an alternative treatment for these occupational hazards. 43.9% did not take any measures to treat these occupational hazards this was in contrast to the present study were 62.1% of DP were involved in some kind of rest breaks during their practice. To our knowledge this was the first study in India to perform interventional study in dental practitioners with respect to knowledge, attitude and practice in ergonomics. The knowledge showed statistically significant difference but no statistically significant result was obtained with respect to attitude and practice. This might be due to short duration of the study with less intervention.

Conclusion

The result of this study shows that the health education tool proved to increase the Knowledge ($p=0.002$) about Ergonomics following health education but there was no favorable change in the attitude ($p=1.000$) and practice ($p = 0.655$) of Ergonomics among dentists. This clearly indicates that there must be continuous reinforcement of health education about the ergonomic principles among dentists to bring about change in the attitude and practice of ergonomics.

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