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Knowledge, Attitude and Behavior towards "ERGONOMICS" among Oral Health Professionals in Jodhpur city, Rajasthan, India

Abstract

Background: Literature suggests increase in the prevalence of various ergonomics related disorders among dentists and but there is lack of information related to knowledge, attitude and practice regarding ergonomics in routine dental practice in Indian scenario. **Objective:** The present study was undertaken to assess knowledge, attitude and practice about ergonomics among oral health professional in Jodhpur city, Rajasthan, India. **Methodology:** The study was done among all the dentists of the Jodhpur city (150). A total of 100 dentists voluntarily participated in the study making a response rate of 67%. Data collection was done by close ended and self administered questionnaire. Knowledge, attitude and behaviour were assessed by 20, 8 and 8 items and demographic variables like age, gender, religion, income, years of clinical experience, marital status, IDA membership was also assessed.

Results: The present study shows no significant relation between knowledge, attitude and behavior. Males have more positive attitude and behavior than females towards ergonomics in routine dental practice and there is positive significant association of Hindu religion and behavior compared with other religions ($p \leq 0.05$). **Conclusion:** It can be concluded from the study results that oral health professional need to emphasize on practicing ergonomics in their routine dental practice to avoid major ergonomics related health problems.

Key Words

Dentists; ergonomics; Indian scenario

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INTRODUCTION

Ergonomics- in Greek" ergo" means work and "nomics" means natural law or system.[1] The coining of the term Ergonomics, however, is now widely attributed to British psychologist Hywel Murrell, at the meeting in 1949 at the United Kingdom's Admiralty, which led to the foundation of The Ergonomics Society. The International Ergonomics Association defines ergonomics as follows: Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.[2] According to Antonio-José Diaz-Caballero *et al*.,[3] dentistry is a profession that generally produces various musculoskeletal pains and soreness, which are slow to appear, consequently, the symptoms are usually ignored until they become chronic and permanent lesions become evident. Hence, Bramson *et al*.,[4] mentioned that, it is very important to maintain an adequate work posture and that the instruments and furniture that the dentist is working with have adequate working characteristics. According to Yousef MK *et al*.,[5] among the wide range of musculoskeletal disorders, back–pain was the most common among dentists followed by neck pain, high muscle tension on trapezoids, tendonitis, carpel

Table 1: Knowledge, attitude and behavior of respondents

Variables		Number of subjects
Knowledge	≤ 14 (poor)	17
	15 to 18(fair)	59
	≥18(good)	24
Attitude	≤ 28 (poor)	19
	29 to 37(fair)	64
	≥ 38(good)	17
Behavior	≤ 15 (poor)	16
	16 to 27 (fair)	67
	≥ 28 (good)	14

Table 2: Pearson's correlation analysis of knowledge, attitude and behavior among respondents

	Knowledge		Attitude		Behavior	
	r value	P value	r value	P value	r value	P value
Knowledge						
Attitude	0.065	0.520				
Behavior	-0.116	0.256	-0.019	0.852		

Table 3: Correlation analysis of demographic variables with knowledge, attitude and behavior about ergonomics among study subjects by using chi-square test

Demographic variables	Knowledge		Attitude		Behavior	
	X^2 value	P - value	X^2 value	P – value	X^2 value	P – value
Age	16.437	0.794	27.601	0.841	43.430	0.581
Gender	**23.164**	**0.017***	8.918	0.962	18.980	0.702
Religion	6.021	0.872	23.240	0.182	**40.286**	**0.014***
Marital status	16.270	0.131	8.265	0.974	24.320	0.386
Income	29.974	0.119	39.984	0.298	55.074	0.169
Years of experience	29.974	0.119	39.984	0.298	55.074	0.169
Ida member	6.098	0.867	18.606	0.416	27.057	0.254

tunnel syndrome, nerve trapping, early arthrosis, myopia, auditive alterations and many more. Pargali *et al*.,[6] in 2010 reported 73 percent of dentists complained of back and neck pain. Even though the practice of four handed dentistry and ergonomically well adjusted equipments are on the rise, still Paldhikar *et al*.,[7] have reported rise in the back, neck, shoulder and arm pain, in almost 81 percent of dental operators. Chowanadisai *et al*.,[8] Szymanska J,[9] Milerad E and Ekenvall L,[10] emphasized on factors like, work related stress, tension and awkward postural positions can add on to back & neck problems to the dentist. Hence, the dentists who are into private practice need special healthier ergonomics habits to improve their longevity. Since the dental professionals serving the people are increasing and musculoskeletal problems are more in dentists, they have to be educated for optimal ergonomic habits and along with that their level of awareness for the same has to be evaluated.

Needless to say that age of the dentist is closely related with how many years the dentist has been practicing. Cagnie *et al*.,[11] succeeded in proving increasing years of practice is related to increasing prevalence of musculoskeletal problems. Moreover, Tendon S[12] mentioned that the female dentists have outnumbered males in dentistry and study conducted by Unruh AM[13] suggests that they are more prone to develop musculoskeletal pain than men. Hence it becomes the need of the hour to educate them regarding various musculoskeletal problems arising due to unhealthy postural habits at the time of delivering oral health services, in order to implement preventive and corrective measures for promoting healthy life styles during their professional practice. Therefore a questionnaire survey was conducted to evaluate awareness, attitude and practice of ergonomics during routine dental procedures among oral health professionals in Jodhpur city, Rajasthan, India.

MATERIALS & METHODS

This study was conducted among oral health professionals or private practitioners of Jodhpur city, Rajasthan, India. The participation in the study

was voluntary. The study population consisted of all the dentists of Jodhpur (150). Out of 150 subjects only 100 participated including. For private practitioners, their clinics were approached by one of the author who gave the instructions to rest of the study subjects. The purpose of the survey was explained and those who gave consent for participation in the study were included followed by filling of survey questionnaire. Through questionnaire method knowledge, attitude and practices of study subjects on ergonomics in field of dentistry was assessed. The questionnaire consisted of a total of 36 items with 20, 8 and 8 items assessing knowledge, attitude and practices respectively. Attitude was assessed on a five-point: definitely yes, yes, no, definitely no, may be, don't know. The response options for practices were also a five-point as follows:< 1month, 1-6 months, <6 months, > 1year and never. Knowledge was assessed by a total of 21 questions on ergonomics focused on principles of ergonomics in routine dental procedures such as cavity preparation, extraction of teeth and various complications, which may arise as a result of failure to follow the same. Questions related to attitude included: whether ergonomics should be part of the dental curriculum, dentists should follow the ergonomic principles in routine dental practice, dental chair, instruments play any role in following ergonomic principles in routine dental practice, dentist should alternate between sitting and standing posture in between two patient appointments, various dental institutions should conduct continuing dental education. Questions pertinent to practices assessed how frequently the respondents obtained information related to ergonomics in dentistry either from internet or scientific journals, used dental loups for magnification purpose, make an effort to maintain neutral posture while working, attended any workshop/lecture on ergonomics in dental career, does stretching exercises in between two patient appointments. Correct answers for knowledge questions were given a score of 1 and wrong answers were given a score of 0. Attitude scores ranged from 5 (definitely yes) to 1(definitely no), and practices scores ranged from 5 (<1 month) to 1 (never). Cronbach's alpha values for knowledge, attitude and practices were 0.684, 0.784 and 0.810 respectively. The split half reliability values for knowledge, attitude and practices were 0.791, 0.881 and 0.698 respectively. The data were entered into the MS Excel (MS Office version 2007 developed by Microsoft, Redmond, WA) and Intercooled STATA version 9.2 (Stata Corp, TX, USA) was employed to perform statistical analysis. Pearson's correlation analysis was used to assess associations between knowledge, attitude, and practices of study subjects. Chi-square test was used to assess associations of age, gender, religion and marital status with knowledge, attitude and practices of study subjects.

RESULTS

The questionnaire was filled by total of 68 male and 32 female dental professionals belonging to various academic positions. For ease of understanding, responses given by participants were divided into categories as good, fair and poor. Maximum respondents were falling into fair category for all the three variables (Table 1). Pearson's correlation analysis was conducted (Knowledge, attitude and practice. Table 2), there was no significant correlation between knowledge and attitude, attitude and behavior and knowledge and behaviour. To assess correlation between various socio-demographic variables with knowledge, attitude and practices, Chi – square test was used (Table 3), which showed significant correlation of gender with knowledge ($\chi 2 = 23.164$, $P = 0.017$. Religion was significantly in correlation with behavior ($\chi 2 = 40.286$, $P = 0.0182$)

DISCUSSION

Musculoskeletal Pain is a major problem acknowledged amongst dental professionals affecting their efficiency and job satisfaction; the main reason for this may be attributed to inappropriate workplace ergonomics. In the Indian senario where numbers of practicing dentists are increasing at a high rate, there is continued increase in prevalence of musculoskeletal problems. Inspite, ergonomics been always the subject to be neglected, from both knowledge and practice point of view during clinical work. In addition, ergonomics is not a part of the syllabus proposed by Dental Council of India (DCI) for both under - graduate and post - graduate level, as a result the knowledge of ergonomics is spread through informal means only.[14] In the present study, results showed significant association between knowledge regarding ergonomics and gender similar results were found in the study[15] conducted by Shipra Gupta and Vela Desai *et al*. A similar study[16] done by Karibasappa GN *et al.*, shows significant association between female MDS dentist and knowledge regarding ergnomics. This may be due

to the fact that in India, especially Rajasthan, it has been noticed that male are the earning partners in the family and more access to outside world so they have more knowledge and inclination towards ergonomics than females. Though females are also working in some families but still their number is less when compared. A significant correlation was determined in the present study between religion and behavior , similar results were also reported by the study[17] conducted by Alina Puriene and Nina Nevala *et al*. The reason behind this association might be the participants, as the maximum numbers of participants in the present study were Hindus. So according to the present study Hindus have positive behavior towards the practice of ergonomics. Further studies should be conducted to determine the role of religion in ergonomics. In the present study majority of dentists had fair knowledge regarding the ergonomics but didn't results in desired behavior. Same results were seen in study[16] done by Karibasappa GN *et al*. It indicates that alone knowledge is not sufficient to change the behavior of dentists. As a result studies conducted so far regarding the ergonomics in clinical dentistry in Indian context, listed out some of the important and most prevalent musculoskeletal disorders such as, lower back pain, neck pain, pain in wrist and hand joints, shoulder etc., affecting dental professionals whether full time or part time practitioners. Among these most common being neck pain, wrist pain and back pain. These musculoskeletal disorders affect as much as more than one third of dental practitioners and Muralidharan *et al*.,[18] reported that solely such musculoskeletal disorders absorb about 40% of all costs towards treatment of work related injuries. Emerging trends of these musculo-skeletal disorders calls for need to concentrate more on ergonomic awareness and practices in clinical dentistry. Also, specific stretching exercises should be encouraged for dentists. These should include specifically designed exercises for trunk, shoulder girdle, hands and neck. Deep thoughts should be given from ergonomics point of view while selecting operator's stool, patient chair, hand instruments, etc. Policy makers such as DCI, syllabus regulatory bodies of health universities, should come up with adequate importance towards ergonomics as part of syllabus, both theoretically and practically.[19]

CONCLUSION

The present study reveals the situation of ergonomics and use by dental professionals during routine dental procedures. There is requirement for inclusion of ergonomics as more organized topics in dental curriculum and also putting more stress on not only theoretical knowledge but along with the practical implication used during various dental procedures. The results from the present study shows that oral health professional need to emphasize on practicing ergonomics in their routine dental practice to avoid major ergonomics related health problems. Further studies are needed to impart knowledge and create awareness about ergonomics so that dentists can lead a healthy professional life.

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