ISSN No:-2456-2165

Musculoskeletal Problems and Attitude Towards Ergonomics Among Dental Students in a Teaching Dental Hospital in Andhra Pradesh: a Cross-Sectional Study

Tejaswini Guduru,
Final BDS Student,
SIBAR Institute of Dental Sciences, Takkellapadu, Guntur.

Akhila Gundimeda,
Final BDS Student,
SIBAR Institute of Dental Sciences, Takkellapadu, Guntur.

Manoj Kalluri,
Final BDS Student,
SIBAR Institute of Dental Sciences, Takkellapadu, Guntur.

Viswa Chaitanya Chandu,
Assistant Professor,
Public Health Dentistry, SIBAR Institute of Dental Sciences, Takkellapadu, Guntur.

Srinivas Pachava,
Professor and Head,
Public Health Dentistry, SIBAR Institute of Dental Sciences,
Takkellapadu, Guntur.

Abstract:-Introduction According to World Health Organization (WHO), Musculo Skeletal Disorder (MSD) is a disorder of muscles, tendons, peripheral nerves or vascular system not directly resulting from acute or instantaneous events. Procedures in oral health care often require longer appointments and involve work that demands the use of force, repetition. When these longer appointments are coupled with incorrect posture, the probability of developing musculoskeletal complications increases. Objectives: The objective of this study is to identify the musculoskeletal problems experienced by dental students in a teaching dental institution in the capital region of Andhra Pradesh and to discern the attitude of these students on ergonomics. Materials and Methods: This cross-sectional study was conducted among undergraduate students from clinical years and post graduate students attending a dental institution in the capital region of Andhra Pradesh using a self administered, structured questionnaire. A total of 227 filled questionnaires were returned, of which, 216 were included in the final analysis after elimination of questionnaires with incomplete responses. Results: 197 students reported having experienced one or more of the musculoskeletal problems. There was a significant difference in the type of musculoskeletal complaints based on gender, with lower back pain being the most common complaint among both males and females. Restorative dentistry was reported to be the most common cause for MSDs. Conclusion: There was a high prevalence of MSDs in the present study. Measures to integrate ergonomics teaching in the curriculum and practice of proper postures in the course of delivering care are necessary for stress free provision of oral health care.

Keywords:- Dental education; Ergonomics; Musculoskeletal problems.

I. INTRODUCTION

Dentistry has evolved as a profession in a multitude a ways across the world over the past few decades. Despite global differences in the awareness of the importance of oral health and care seeking behaviors, there has been substantial improvement in the attitude of population towards oral health all over the world.[1] India deserves special attention in this regard in light of the profound diversity in the geographic, cultural, social parameters of the nation's populace. With diversity as huge as India's, it is almost inevitable to have differences in the perceptions about oral health. To meet this challenge of making this humungous population aware of the importance of oral health and to deliver optimum oral health care, there is a need for larger dental work force. The country has duly responded to this requirement and made necessary changes to its dental educational system. At present, there are 310 dental colleges in India which is more than any other country in the world.[2]

Dental students in India finish their pre clinical curriculum in second year of graduation of the five year course that includes a one year compulsory rotatory internship. The students get an opportunity to provide care for the patients starting from their third year of graduation.[3] While it is fortunate to be able to deal with patients early in the professional careers, it gets physically challenging when thorough understanding of the proper postures in the course of delivering care is not developed. Dentistry is a challenging career with regard to the physical demands of the profession.

ISSN No:-2456-2165

Physical hazards like musculoskeletal complications form an integral part of the spectrum of occupational hazards the dental professionals are vulnerable to, which range from infectious hazards to ionizing radiation exposure.[4] According to World Health Organization (WHO), Musculo Skeletal Disorder (MSD) is a disorder of muscles, tendons, peripheral nerves or vascular system not directly resulting from acute or instantaneous events. These disorders are considered to be work-related when the work environment and the performance of work contribute significantly, but are only one of a number of factors contributing to the causation of a multi-factorial disease.[5] Procedures in oral health care often require longer appointments and involve work that demands the use of force, repetition. When these longer appointments are coupled with incorrect posture, the probability of developing musculoskeletal complications increases. Therefore, it is extremely important to make the dental students aware of the importance of proper postures and techniques to maintain optimum fitness in order for them to serve the country's populace as future oral health care professionals. With this background, the objective of this study is to identify the musculoskeletal problems experienced by dental students in a teaching dental institution in the capital region of Andhra Pradesh and to discern the attitude of these students on ergonomics.

II. MATERIALS AND METHODS

This cross-sectional study was conducted among undergraduate students from clinical years and post graduate students attending a dental institution in the capital region of Andhra Pradesh. The study was conducted in the months of October and November, 2017. Ethical approval for the study was obtained from the Institutional Review Board of the teaching dental hospital. A self administered structured questionnaire was used to collect information regarding musculoskeletal problems experienced and to identify the attitude of the students relating to training in ergonomics. Details regarding academic year of the student, gender were included in the questionnaire. The questionnaire was pilot tested among 30 students to establish face validity. Minor corrections in the pattern of questions were done without changing the content. The questionnaire was then reviewed by four experts in the specialty of Public Health Dentistry for content validity. All the questions were opined to be fully relevant and therefore retained in the final questionnaire. The questionnaire was administered to IV BDS students, interns, I, II, III MDS students during leisure hours. Anonymity was maintained to ensure responses without bias. The participation in the study was voluntary and informed consent was obtained from the participants who were willing to participate. A total of 227 filled questionnaires were returned, of which, 216 were included in the final analysis after elimination of questionnaires with incomplete responses. Statistical analysis was done using SPSS V 20 software and descriptive statistics, Chi-square test, Fisher's exact test were used to analyse the data.

III. RESULTS

Of the 216 participants, 154 were females (71.3%). Majority of the participants were final year students (44%) followed by interns (36.6%). Table 1 shows the prevalence of common musculoskeletal problems experienced by the students. Only 19 students reported not having experienced any of the musculoskeletal problems. There was a significant difference in the type of musculoskeletal complaints based on gender, with lower back pain being the most common complaint among both males and females (Table 2). Table 3 shows the common dental procedures associated with musculoskeletal complaints as reported by the students. There was significant difference in the impact of MSDs on daily activities of the students based on academic year with I MDS students reporting high impact and interns reporting the least (Table 4). 188 students reported being aware of the basic principles of ergonomics with no significant differences based on gender and academic year. However, significant difference was noted in the attitude of the students towards having training in ergonomics as a part of the curriculum based on academic year (Table 5).

Musculoskeletal Problem	Prevalence (%)
Neck Pain	33.3
Lower Back Pain	46.8
Wrist Pain	20.8
Shoulder Pain	25.5

Table 1: Prevalence of Common Musculoskeletal Problems

Musculoskeletal Problem	Males (%)	Females (%)	P-Value
Neck Pain	27.4	23.4	0.003*
Lower Back Pain	33.9	39.6	
Wrist Pain	12.9	11.7	
Shoulder Pain	19.4	15.6	
No Pain	6.4	9.7	

Table 2: Prevalence of Type of Musculoskeletal Problems Based on Gender

Chi-square test; $p \leq 0.05$ was considered significant

ISSN No:-2456-2165

Type of Procedure	Percentage of students reporting
Restorative	30
Scaling	15
Endodontic	12
Extractions	7
Prosthetic	8
Others	28

Table 3: Common Dental Procedures Associated with Musculoskeletal Problems

Academic Year	Yes (%)	No (%)	P-Value
IV BDS	60 (63.2)	35 (36.8)	0.041*
INTERNS	30 (38)	49 (62)	
I MDS	10 (83.3)	2 (16.7)	
II MDS	12 (70.6)	5 (29.4)	
III MDS	6 (46.2)	7 (53.8)	

Table 4: Impact of MSDs on Daily Activities Based on Academic Year

Fisher's Exact Test; $P \leq 0.05$ was considered significant

Academic Year	Yes (%)	No (%)	P-Value
IV BDS	67 (70.5)	28 (29.5)	0.028*
INTERNS	49 (62)	30 (38)	
I MDS	10 (83.3)	2 (16.7)	
II MDS	16 (94.1)	1 (5.9)	
III MDS	11 (84.6)	2 (15.4)	

Table 5: Attitude of Students towards Training in Ergonomics Based on Academic Year

Fisher's Exact Test; $P \leq 0.05$ was considered significant

IV. DISCUSSION

The prevalence of musculoskeletal problems was considerably high in the present study. Dental students regardless of the academic years were found to experience different sorts of pain with the lower back pain being the most prevalent. Similar observations of high prevalence of musculoskeletal problems were reported in the studies conducted by Abdul Rahim Shaik et al, 2011[6]; Somsiri Decharat et al, 2016[7]; Vishwas Madaan and Amit Chaudhari, 2012[8]; Vijay S and Ide M, 2016[9]; Syed Batool Abbas et al, 2015[10]. Comparable to the current study, lower back pain was reported by most of the participants in the studies conducted by Vijay S and Ide M, 2016[9]; Syed Batool Abbas et al, 2015[10]. In contrast, studies conducted by Somsiri Decharat et al, 2016[7] and Vishwas Madaan, Amit Chaudari, 2012[8] reported shoulder pain and hand pain to be the most common musculoskeletal complaints respectively. While only 15% of the students reported periodontal procedures (scaling) to be the common dental procedure producing pain, a study by Vishwas Madaan and Amit Chaudhari, 2012[8] documented that 88% of the students as experiencing pain with performing periodontal procedures. Endodontic procedures were reported to be the second most common dental procedures causing musculoskeletal pain by Vishwas Madaan and Amit Chaudhari, 2012[8], while restorative and endodontic procedures are the most commonly reported reasons for pain in the present study.

According to the present study, there is an increased effect of MSD on daily activities among the students of I MDS (83.3%). We did not consider the duration of break between completion of BDS and enrolment into MDS curriculum. Conventionally, there is gap of around 1 year between these two during which graduate students stay away from clinical work and are engaged in PG entrance preparation. This could be a reason for the increased perception of effect of MSD on their daily activity.

The high prevalence of MSD in this study suggests the need to identify the factors predisposing to MSD among the dental practitioners. This might be due to lack of an ergonomically oriented work practice. The dentist population ratio of India is 1: 10,271 when compared to the WHO recommendation of 1 : 7500.[11] Against this background of large population, rising oral health care needs, and inadequate dental manpower, the health and efficiency of the dental care practitioner play a key role in the provision of optimal oral health care for Indian populace.

It is known that the nature of work in dental profession is physically demanding. Assuming an average of six hours of work per day, 250 working days per year, and 30 years of clinical practice in life time, a dentist works for around 45,000 hours in those demanding conditions. Therefore, MSDs are bound to arise when proper care is not taken. MSDs though not uncommon in dental profession can easily be avoided by following postural awareness techniques; avoiding sedentary postures and inadvertent twisting, bending; taking periodic breaks; practicing stretching exercises; practicing four handed dentistry[12].

Limitations of our study include the inability to correlate the role of age, sex, duration of practice, weekly working hours, rest periods during practice, clinical assistance and working conditions to the musculoskeletal pain experienced by dentists. Further studies need to address the aforementioned limitations in order to make logical conclusions.

V. CONCLUSION

The prevalence of MSDs in the present study is high with lower back pain during restorative problems being the most common complaint from the study participants. The study results demonstrates the dire need for dental students to be well aware with ergonomics as professionals who are going to assume the responsibility of providing oral health care for the public in future for optimum durations.

REFERENCES

[1]. The Challenge of Oral Disease – A call for global action. The Oral Health Atlas. 2nd ed. Geneva: FDI World Dental Federation; 2015.
[2]. Sankalp Yadav, Gautam Rawal. The current status of dental graduates in India. Pan Afr Med J 2016; 23:22.
[3]. Government of India. Revised B.D.S. course (3rd amendment) regulation. The Gazette of India, Part III, Section 4, No. 176, New Delhi, August 25, 2011.
[4]. Amandeep Chopra. Musculoskeletal disorders in dentistry – a review. JSM Dent 2014; 2(3): 1032.
[5]. Identification and control of work-related diseases: report of a WHO expert committee. World Health Organ Tech Rep Ser. 1985; 174: 7-11.
[6]. Abdul Rahim Shaik, Sripathi B.H. Rao, Akhter Husain, Juliana D'sa. Work related musculoskeletal disorders among dental surgeons: A pilot study. Contemp Clin Dent 2011; 2(4): 308-312.
[7]. Somsiri Decharat, Piriyalux Phethuayluk, Supandee Maneelok. Prevalence of musculoskeletal symptoms among dental health workers, Southern Thailand. Advances in Primitive Medicine 2016.
[8]. Vishwas Madaan, Amit Chaudhari. Prevalence and risk factor associated with musculoskeletal pain among students of MGM dental college: a cross sectional study. Journal of Contemporary Dentistry 2012; 2(2): 22-27.
[9]. Vijay S, Ide M. Musculoskeletal neck and back pain in undergraduate students at a UK dental school – A cross sectional study. British Dental Journal 2016; 221(5): 241-245.
[10]. Syed Batool Abbas, Samir Riaz Qazi, Sundus Iftikhar, Muhammad Usman Iqbal. Musculoskeletal disorders among dentists and dental students. Pakistan Oral and Dental Journal 2015; 35(3): 461-465.
[11]. Sudhakar Vundavalli. Dental manpower planning in India: current scenario and future projections for the year 2020. International Dental Journal 2014; 64(2): 62-67.
[12]. Anshul Gupta, Manohar Bhat, Tahir Mohammed, Nikita Bansal, Gaurav Gupta. Ergonomics in dentistry. Int J Clin Pediatr Dent 2014; 7(1): 30-34.