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PREVALENCE OF MUSCULOSKELETALDISORDERS AMONG DENTISTS

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ABSTRACT

INTRODUCTION: Dentistry is a high risk profession for developing Musculoskeletal Disorders (MSD) because high visual demands result in prolonged and affixed as well as uncomfortable postures. This study was an attempt to assess the risk of Musculoskeletal Disorders among dental practitioners and eventually to spread awareness regarding the importance of good posture and proper ergonomics.

AIM AND OBJECTIVES: The purpose of this article was to spread awareness regarding the importance of good posture and proper ergonomics. The objective of this study was to determine the distribution of Musculoskeletal Disorders among the dentists and to assess the ergonomic skills in the dental workplace.

METHODOLOGY: The study was conducted on 56 dental practitioners of various specialties to assess the prevalence of musculoskeletal Disorders. The questionnaire recorded the basic demographic features, the working conditions of the dental professionals and responses, specifically pertaining to the existing Musculoskeletal Disorders and quantitatively analyzes the severity of the symptoms and more frequently affected anatomical areas in terms of their effect on activities.

RESULTS: The overall prevalence of Musculoskeletal Disorder was (76.67%).(60.87%) of dentists were most commonly affected by Low-back pain followed by neck (52.17%), shoulders (21.74%), wrist(13.04%) and arm (4.34%).Continuing education for dental practitioners about the proper and correct dental positions as well as practicing ergonomic skills and incorporating them into the curriculum would be beneficial.

KEY WORDS: Dentists, Musculoskeletal Disorders, Ergonomics.

INTRODUCTION

Dentistry is a demanding profession involving high degree of concentration and precision. The dental profession not only involves intellectual, but also physical effort. Dentists perform the vast majority of their clinical procedures in a constrained posture and with static loading of the muscles, which is more harmful for all systems, in particular the nervous and musculoskeletal systems than dynamic loading. High prevalence of Musculoskeletal Disorders exists among our dental practitioners affecting the daily practice of more than one third[1]. Also the dental surgeons often cannot avoid prolonged static postures. If regularly occurring pain or discomfort is ignored, the cumulative physiological damage leads to an injury or a career ending disability[2]

The risk of developing such disorders caused by repetitive precision demanding handgrips, difficult work positions, large cervical flexion and rotation, extreme precise procedure and long treatment time to spend in patient's mouth[3].Basic operating posture is considered an important occupational health issue for dental surgeons. It is generally agreed that the physical posture of the operator should be such that all the muscles are in a relaxed, well-balanced, and neutral position. Postures outside of this neutral position are likely to cause musculoskeletal discomfort[2].

WHO in 1985 defines Musculoskeletal Disorders as "a disorder of muscle, tendons, peripheral nerves or vascular system not directly results from an acute or instantaneous event[4]"Musculoskeletal disorders are one of the most important work-related problems that are currently reported. It is caused or aggravated by repeated movements and prolonged awkward or forced body postures[2]. About 2 million workers suffer from musculoskeletal disorders each year (Laderas et al 2002). Dentists are among the workers who are often susceptible to musculoskeletal disorders.

Fernandez and Marley in 1998 defines" Ergonomics is the study of the design of a workplace, equipment, machine, tool, product, environment, and system which takes into consideration human being's physical, physiological, biomechanical, and psychological capabilities and optimizes the effectiveness and productivity of work systems while assuring the safety, health, and well-being of the workers". Ergonomics therefore is an applied science concerned with designing procedures for maximum efficiency and safety[5]. Proper ergonomic design is necessary to prevent repetitive strain injuries, which can develop overtime and can lead to long-term disability. Well planned ergonomics intervention program can reduce the global burden of this problem[6].This study was planned to assess the prevalence of Musculoskeletal disorders among dentists working in Madha Dental College and Hospital.

MATERIALS AND METHODOLOGY

The proposed study was reviewed by the ethical committee at Madha Dental College and Hospital, Kundrathur, Chennai, Tamilnadu. Before conducting the study, permission was obtained by the concerned authority. Voluntary written informed consent was obtained from the participants in the study. The study was conducted on 56 dental practitioners of various specialties working in Madha dental college and Hospital, Chennai to assess the prevalence of musculoskeletal Disorders.

A specially prepared and pretested proforma was used for recording the data, a questionnaire. The purpose of the study was explained in detail to the participants and also the method for answering the questionnaire was explained. It was self-administered and contained questions aimed at gathering quantitative data. It contains two groups of questionnaire those are the demographic status and general questionnaire and the specific questionnaire. The general questionnaire covers the information regarding the basic demographic variables such as age, gender, qualification, duration of practice, average patients seen per day, nature of practice and the specific questionnaire contains information related to the musculoskeletal disorders such as the anatomical areas in which the musculoskeletal symptoms are most common (neck, shoulders and low back regions), about the first symptom and the type of treatment they received. The sampling method adopted was purposive sampling and all the staff faculties who were working in Madha Dental College and Hospital. The questionnaire recorded the basic demographic features, the working conditions of the dental professionals and responses, specifically pertaining to the existing Musculoskeletal Disorders and quantitatively analyzes the severity of the symptoms and more prevalently affecting anatomical areas in terms of their effect on activities.

Inclusion criteria: The Dentists who were doing clinical practice for atleast one year, acceptance to voluntarily participate in the study and present on the day of survey were included in the study.

Exclusion criteria: The non-practicing Dentists, Dentists those have Pain before starting their practice, dentists who were refusing to participate for any reason and absent on the day of survey were excluded in this study.

RESULTS

Among 56 Dentists responded and answered the questionnaire, 53.33% were males and 46.67% were females.Majority40% were general dental practitioners (including undergraduates, specialty in Oral medicine, Oral pathology and Public Health Dentistry),16.67% were Endodontists, 10%periodontists, 10%orthodontists, 10% pedodontists, 10%prosthodontists and 3.33%oral surgeons. In this study, 76.67%of the participants have reported musculoskeletal disorder. Prevalence of MSD was found to be similar for male and female practitioners irrespective of the area involved

Fig1: Age wise presence of Musculoskeletal Disorders among Dentists.

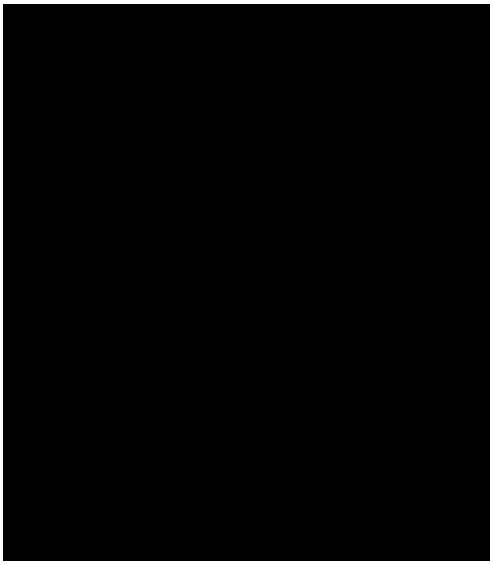


Fig1shows the age group wise presence of musculoskeletal disorders in participants in the range of 25-30years (66.67%), 31-35years (80%), 36-40years (80%) and above40years (75%).In this study high incidence of MSD found in participants between the age group of 30-40 years followed by participants above 40 years

Also, the Musculoskeletal Disorder in relation to specialization of dental practitioners was highest among the Endodontists (100%) and Periodontists (100%), followed by general Dental practitioners (75%), Orthodontists (66.67%), and Pedodontists (33.33%) as presented inFig2

Fig2: Prevalence of Musculoskeletal Disorders in relation to specialization of Dental practitioners in percentage.

Fig3: First symptom of musculoskeletal disorder experienced by the participants in percentage

Most of the participants experienced their first symptom as Pain (43.47%) followed by discomfort (30.43%) and stiffness (26.08%) as shown in Fig 3.Dentists are predisposed to pain or injury in different regions of the body depending on the type of work and the position adopted. Back and neck were the most common sites for Musculoskeletal Disorders, as dentists do large of their work with their head bent forward and rotated and with their arms, especially the right one, held out from the body. This working posture leads to a considerable load on different structures in the neck, back and shoulders. In this study, the most common painful sites were Back(60.87%),followed by neck(52.17%), shoulder (21.74%), Wrist(13.04%) and Arm(4.34%).These results indicate that most of the practitioners adopt positions which frequently result in Musculoskeletal Disorders of the neck and low back regions. Hands and arms were less affected with MDSs as shown in Fig4.

Fig4: Prevalence of Musculoskeletal Disorder in relation to the area involved in percentage

Around 30% of participants experienced pain in more than one part of the body and 70% experienced pain in single region as shown in Fig5 .In the present study, 17.39%of participants reported that they have pain in two regions and 13.04% have pain in multiple regions and the most common sites reported were the neck and back. In the present study, around 60% of the participants reported that they have pain occasionally and 30% of them experienced for less than 2years and 4% have pain for 2-5years and the remaining 4% have 5-10 years is presented in Fig6. In this study, the participants those are practicing less than 2years have reported 80% pain prevalence, practitioners with 2-5years practice have reported 77.78%, 5-10 years and more than 10 years of practitioners reported 75% as given in Fig7.In this study, Participants those are practicing less than 2hours have reported 75%pain prevalence, participants with 2-4hours practice per day reported 77.77%,participants with 4-5hours practice reported 83.33% and those are with more than 10years practice reported 50% and it is shown in Fig8

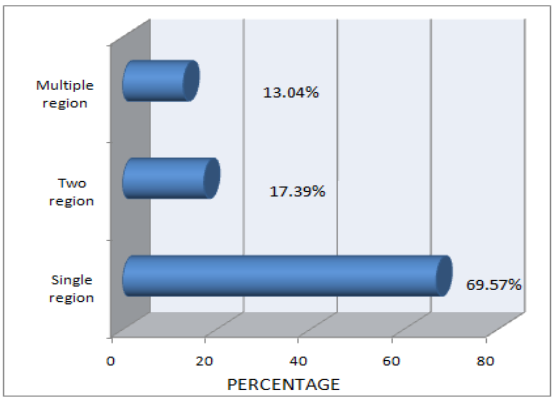


Fig6: Duration of pain experienced by the patient (in percentage)

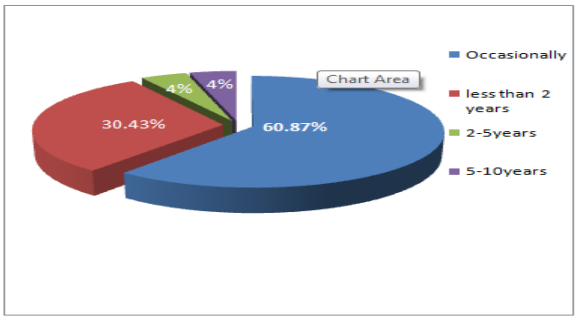


Fig7: Prevalence of Musculoskeletal Disorder in relation to duration of practice of the participants in percentage

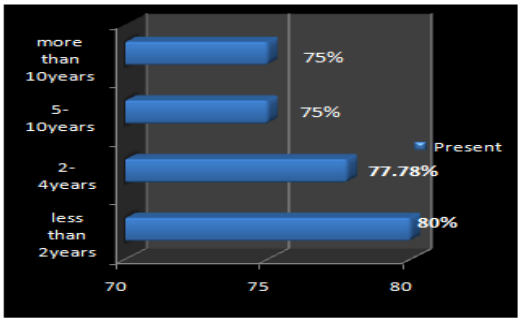
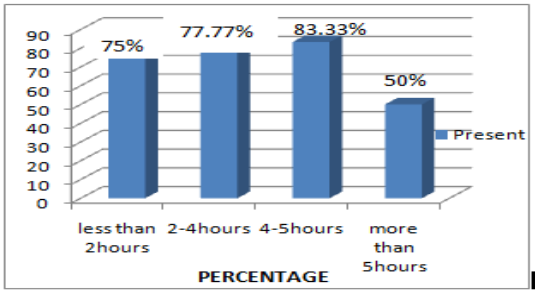
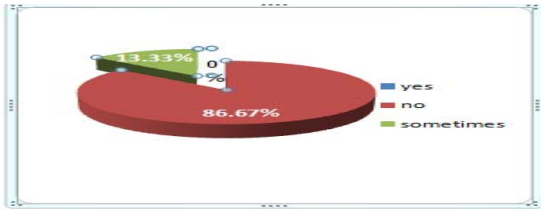


Fig8: Percentage of pain prevalence in relation to number of hours per day they spend in practice.



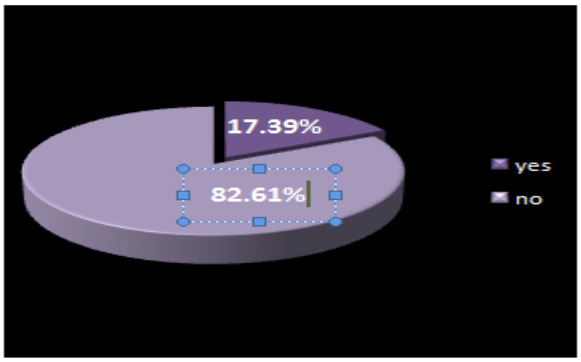
Among risk factors for the development of Musculoskeletal Disorder, the most significant is that the improper awareness of ergonomics. 87.5% of studies detected static posture during working hours, followed by repetitive movements, muscle imbalances and individual characteristics. Regarding preventive measures, in narrative reviews stretching exercises after each dental examination and at the end of the working day were deemed most useful and effective in preventing musculoskeletal disorders. About 86.67% of the participants reported that they are not practicing chair side exercise in their day-to-day dental practice and 13.33% have reported that they are practicing it occasionally but not regularly and it is shown in Fig9. In the present study, 82.61% of the participants with Musculoskeletal Disorders are not taking any treatment for their condition and 17.39% of them taken treatment as given in Fig10.Of that, 50% underwent Physiotherapy, 25% underwent Ayurvedic treatment and 25% of them underwent surgery

Fig9: Percentage of Participants practicing



chair side exercise in their Day-to-day life

Fig10: Percentage of participants those are all under-taken treatment for their condition



Discussion

Dentistry is a high risk profession for the development of Musculoskeletal Disorders as it requires high visual demands which results in the adoption of fixed postures. The Musculoskeletal health of dental practitioners has been a subject of interest for numerous studies worldwide. The study showed that 76.67% of the participants have musculoskeletal disorder. This results correlates with the earlier investigations with different parts of the world. The high incidence of Musculoskeletal Disorders found in participants between the age group of 30-40 years (80%) but the other studies like Ahmed AS1 and Oraby EE2 and World Journal of Dentistry, 2015reported high incidence in more than 40 years (70.8%). Highest prevalence of pain according to different specialties showed that Endodontists (100%) and Periodontists(100%), followed by general Dental practitioners as it differs that general dental practitioners were highest reported by Gopinadh A, Devi KNN,2013 .The present study shows that Back pain(60.87%) was the most common area affected followed by neck(52.17%), shoulder(21.74%), Wrist(13.04%) and Arm(4.34%) and it correlates with the study given by Ahmed AS1 and Oraby EE2 Alexopoulos E.C.,2004(46%) .The prevalence of lower back pain is lesser than reported by Al-Gunaid TH, Abdulhai R ,Flemban B in2017(65.7%).

Around 30% of participants experienced pain in more than one part of the body as it correlates with the findings of Gopinadh A, Devi KNN, Chiramana S,2013 and 70% experienced pain in single region .In the present study, 17.39% of participants reported that they have pain in two regions and 13.04% have pain in multiple regions. The participants those are practicing less than 2years have reported 80% pain prevalence, practitioners with 2-5years practice have reported 77.78%, 5-10 years and more than 10 years of practitioners reported 75%.It was found that less experienced dentists are more likely to suffer from musculoskeletal problems compared with their more experienced counterpart and this finding shows similar results to study given by Al-Gunaid TH, Abdulhai R, Flemban, 2017. The possible explanations were that experienced dentists are probably better at adjusting their working position and techniques in order to avoid musculoskeletal problems. Bhagwat S, Hegde S, Mandke L ,2015 reported that more than half of the dental practitioners did not perform any exercise or indulge in any sport on daily basis and this increased their risk of having musculoskeletal disorders. Similar results found that about 86.67% of the participants reported that they are not practicing any chair side exercise in their day-to-day dental practice and 13.33% have reported that they are practicing it occasionally. Because of the burdensome nature of the dentist's work, experts recommend physical exercise outside the dental clinic[7]. Spending prolonged periods in a fixed position, thereby placing pressure on muscles and increasing skeletal loading, and having to focus on a small field of vision is sufficient reason for dentists to activate both tensed-up muscles and those not engaged or only to a lesser extent engaged in the working process[7, 8].

One factor that affects the dentist's ability to tolerate physical loading (both dynamic and static) is physical fitness. To work the whole time in the optimal ergonomic position the dentist requires highly resilient back and pectoral girdle. This is especially important for women, as their muscles are approximately one third less resilient than those of men, and thus more quickly assume an incorrect position during work. They are thus more susceptible to musculoskeletal disorders[9].

RECOMMENDATIONS AND CONCLUSION

Here we given some of the recommendations for maintaining personal heath and also some stress relieving techniques have mentioned[11].

1. Always try to maintain an erect posture.
2. Use an adjustable chair with lumbar, thoracic, and arm support.
3. Work close to your body.
4. Minimize excessive wrist movements.
5. Avoid excessive finger movements.
6. Alternate work positions between sitting, standing, and side of patient.
7. Adjust the height of your chair and the patient's chair to a comfortable level.
8. Consider horizontal patient positioning.
9. Check the placement of the adjustable light.

Figure11: Wrist extension

Figure12: Spinal extension on foam or towel roll

Figure13:Chest Stretching

Figure14:Neck Stretching

Fig15: Yogasana

If you apply the principles and suggestions that have been recommended, you will be able to reduce the stresses that you put on your hands and arms and greatly lessen the chances that you will develop Musculoskeletal Disorders or repetitive strain injury. Begin to make some changes in the way you practice by incorporating some of these suggestions into your regular routine during the workday. Well planned ergonomic intervention program can reduce the overall burden of this problem.

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