



RESEARCH ARTICLE

AWARENESS ON MUSCULOSKELETAL DISORDER AMONG DENTAL STUDENTS IN CHENNAI

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ABSTRACT

Objectives: Aim and objectives: The aim of this research is to find out current awareness on musculoskeletal disorder among dental students especially in Chennai, Tamil Nadu. This would help in gaining knowledge on dental students' awareness in this specific pathology disorder based on their previous and current knowledge in medical field.

Materials and Methods: Questionnaire consisting of 13 questions are given through online communication system (Whatsapp Apps) with attached link to the online questionnaire that had been prepared earlier (<http://app.surveypplanet.com>). 115 students from 4 dental institutions in Chennai took part in this survey. Dental students from Saveetha Dental College, Meenakshi Ammal Dental College, Sri Ramachandra Dental College and Ragas Dental College.

Results: Awareness of dental students in Chennai is calculated based on their best answer response toward the MSDs based on their current knowledge. Therefore, out of counted questions, the total number of students of 12 counted questions from survey given is 1380 (12 counted questions x 115 dental students). The total best answer for the 12 counted questions is 670. Hence, the percentage of awareness of dental students on Musculoskeletal disorder in Chennai is 48.55%.

Conclusion: Based on recent study, the awareness percentage among dental students in Chennai is only 48.55% which is below the minimum percentage of awareness.[3] The rest are having less awareness or least exposure on MSDs and its effect on them is a major factor that contributed to this result.

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INTRODUCTION

Musculoskeletal disorders are any injuries of human supportive network of muscles, ligaments, tendons, veins, nerves, joints and bones. They can happen from a solitary or aggregate injury and cause genuine annoyance, shoulder, arm, wrist, hands, hips, knees, feet, and upper and lower back (Hayes, 2009). These clutterers are an important related medical issue for dental practitioners (Hayes, 2009 and Puriene, 2007; Leggat *et al.*, 2007 and Leggat, 2006). A few reviews have perceived that musculoskeletal issue contribute extraordinarily and altogether to decrease profitability, debilitated leave and leaving the calling in dentistry (Kierklo, 2011). A few reviews reported a high predominance of musculoskeletal issue in this specific occupational. Chronic neck pain, upper back, lower back and shoulders is the most common musculoskeletal side effect in dental experts (Abiodun-Solanke, 2010).

Wide assortment of causes including physical weight of work, ergonomics, demographic components, and additionally psychosocial factors (Huang, 2002) might be in charge of musculoskeletal side effects in dental specialists (Chowanadisai, 2000). The evidence on dentistry as the most potential risk for musculoskeletal development issue is still not established (Garbin, 2011). Few reviews have contrasted musculoskeletal disorders in dental practitioners and other areas of occupational. (Aminian *et al.*, 2012; Åkesson, 1999; Kerosuo *et al.*, 2000). This study aims to determine the current awareness percentage on musculoskeletal disorder among dental students especially in Chennai, Tamil Nadu. This help in gaining knowledge on dental students' awareness in this specific pathology disorder based on their previous and current knowledge in medical field. Percentage of awareness is calculated. It is a modification formula made by author based on the calculation of Awareness Index (Benz, 2011 and Roberts, 1999). Author modified the Awareness Index formula that had been used in Kaiser Family Foundation 1999 Report.

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MATERIALS AND METHODS

Questionnaire consisting of 13 questions are given through online communication system (Whatsapp Apps) with attached link to the online questionnaire that had been prepared earlier (<http://app.surveypplanet.com>). 115 students from 4 dental institutions in Chennai took part in this survey. Dental students from Saveetha Dental College, Meenakshi Ammal Dental College, Sri Ramachandra Dental College and Ragas Dental College.

Questionnaire for Awareness on Musculoskeletal disorder among dental students in Chennai

- Which year of BDS are you studying currently? (Not counted in calculation of Awareness Percentage)
 - 1st year
 - 2nd year
 - 3rd year
 - Final year
 - Intern
- Have you ever heard about Musculoskeletal disorder before this?
 - Yes
 - No
- Which gender do you think more affected with Musculoskeletal disorder?
 - Male
 - Female
 - Not sure
- Which the following factors do you think lead most to the musculoskeletal disorder in dentist?
 - poor ergonomics
 - repetitive motion
 - pinch force
 - grasp
- Why do you think musculoskeletal disorder occur mostly in dentist profession:
 - Workplace factors
 - Personal factors
- Do you think emotional stress in dentist workplace can lead to MSDs?
 - Yes
 - No
 - Not sure
- Do you think the aged dentist have more probability to develop MSDs compared to young dentist?
 - Yes
 - No
 - Not sure
- With your current knowledge about this disorder, what is a common Musculoskeletal Disorder syndrome?
 - Carpal Tunnel Syndrome
 - Hepatitis B
 - AIDS
 - Muscle dystrophy

9. What are the most common MSDs that develop in dentist?

- Back pain
- Carpal Tunnel Syndrome
- osteoarthritis.
- Cervical spondylosis

10. What are most common co-morbidity in MSDs that occurred?

- Overweight/Obesity
- Chronic pain
- Diabetes mellitus

11. Do you ever know before this that overweight individuals have a higher risk of some MSDs, specifically lower back?

- No
- Yes

12. Do you know about an ergonomic dental chair to avoid back and neck pain?

- Yes
- No/ Never heard before

13. What do you think are the probable precautions to avoid MSDs?

- suitable body posture during working
- Reduce body weight
- Reduce stress

OBSERVATION AND RESULTS

A questionnaire consisting of 13 questions was sent to various years of study of dental students from 4 dental institutions in Chennai, out of which 115 questionnaires were filled. Out of the 115 students who responded to the questionnaire, 55.56% were second year BDS, 22.22% were third year BDS, 14.53% were first year BDS, 5.98% were final year students and 1.71% were Intern.

The survey show the following results:

- Among the respondents of dental students, only 54.78% that had heard about Musculoskeletal disorder (MSDs) before this, meanwhile the rest, 45.22% have never heard about the diseases.
- Most of the students (58.26%) think that male are more affected with Musculoskeletal disorder and the rest (41.74%) think that females are more affected with this disease.
- 34.78% students think that poor ergonomics is the main factor that lead to the musculoskeletal disorder in dentist. Meanwhile, there are 25.22% of students respectively think that repetitive motion and grasp are the main factors. Only 14.78% of students think of pinch force as a factor.

- 86.09% of students think that workplace factors is what making musculoskeletal disorder occur mostly in dentist profession. The rest which is about 13.91% think that personal factors that contribute to this disorder in dentist.
- 50.43% of students think that emotional stress in dentist workplace will not lead to MSDs, 43.48% think that it will lead to MSDs and the rest (6.09%) are not sure about this.
- 43.48% of students think that the aged dentist have more probability to develop MSDs compared to young dentist. However, 40.87% students do not agreed with this statement, and 15.65% students are not sure about this.
- The common syndrome that will happen to patients based on students' current knowledge on MSDs are Muscle dystrophy (30.43%), Carpal Tunnel Syndrome (26.09%), Hepatitis B (22.61%) and AIDS (20.87%).
- 33.91% of students think that back pain is the most common MSDs that develop in dentist, followed by cervical spondylosis (31.30%), Carpal Tunnel Syndrome and Osteoarthritis (17.39% respectively).
- Students think that the most common co-morbidity in MSDs that occurred is overweight or obesity (44.35%), followed by chronic pain (35.65%) and Diabetes Mellitus (20.00%).
- 67.83% of students do not know that overweight individual have a higher risk of some MSDs, specifically lower back and only 32.17% telling that they already know that fact.
- 97% of students respond that they know about an ergonomic dental chair to avoid back and neck pain, meanwhile the rest (15.65%) state that they never heard about this before.
- Majority of students (49.57%) state that suitable body posture during working is the probable precautions to avoid MSDs. Meanwhile other state that reduce body weight (33.91%) and reduce stress (16.52%) is most suitable.

From the questionnaires answered by dental students in Chennai, the percentage of awareness is calculated. Percentage of awareness is modification formulamade by author based on the calculation of Awareness Index (Benz, 2011 and Roberts *et al.*, 1999). Author modified the Awareness Index formula that had been used in Kaiser Family Foundation 1999 Report.

$$\text{Awareness Percentage} = \frac{\text{The total best answers out of counted questions from survey, } n}{\text{The total number of students of counted questions from survey, } \sum n} \times 100\%$$

$n =$ Total number of students answered the best answers out of 12 counted questions from questionnaire
 $= 670$

$\sum n =$ 12 counted questions from questionnaires x 115 dental students
 $= 1380$

$$\text{Awareness Percentage} = \frac{670}{1380} \times 100\% \\ = 48.55\%$$

Awareness of dental students in Chennai is calculated based on their best answer response toward the MSDs based on their current knowledge. Therefore, out of counted questions, the total number of students of counted questions from survey given is 1380 (12 counted questions x 115 dental students). The total best answer from the 12 counted questions is 670. Hence, the percentage of awareness of dental students on Musculoskeletal disorder in Chennai is 48.55%. [Figure 1]

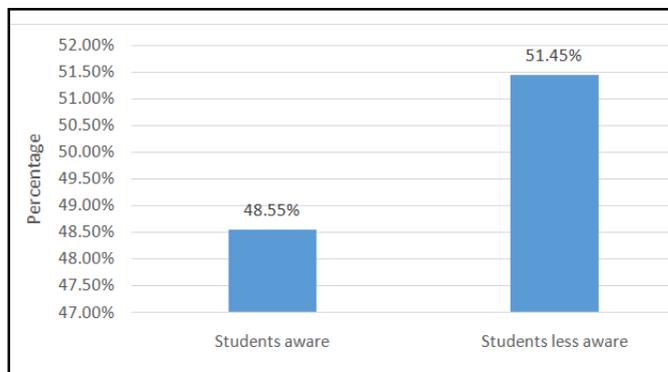


Figure 1. Showing the percentage of dental students in Chennai that aware and less aware about MSDs

Table 1. showing musculoskeletal symptoms experienced by dentists from previous study. [1, 2]

Type of Symptoms of MSDS occurred in dentists	Percentage (%)
Neck	66.0
Shoulder	51.3
Elbow	11.0
Hand	50.3
Upper extremity	73.3
Upper back	51.3
Lower back	55.5

DISCUSSION

In this study, 115 students from 4 dental institutions in Chennai took part in this survey. Dental students from Saveetha Dental College, Meenakshi Ammal Dental College, Sri Ramachandra Dental College and Ragas Dental College are 4 dental institutions that took part in these study. Various elements are asked in order to find out their awareness level based on their current knowledge in the Musculoskeletal Disorder. From the current study conducted by author, the awareness of the dental students on Musculoskeletal Disorder is 48.55% which it is below 50% (minimum percentage of aware in this disorder). [3] There are various elements take into consideration in this study in order to calculate the level of awareness of dental students such as: Gender and MSDs, Age and MSDs, MSDs in dentist profession and their factors, MSDs syndromes, and, MSDs and its precautions.

Gender and age in MSDs

In current study, one question was asked about which gender, male or female most affected with MSDs. Based on previous studies, female showed the higher rate of Musculoskeletal Disorder compared to male (Das, 2015 and Nag *et al.*, 2010; Punnett *et al.*, 2000; Treaster, 2004 and Bergqvist, 1995). For example, upper extremity functional limitation during employment and daily lifestyle for females was higher than males. The limitation for males increased according to their employ time, any stroke or unwanted history, working length, job gratification, physical demand, and work autonomy.

Meanwhile, female workers' upper extremity discomfort was influenced by their disease history, work gratification, and physical needs. Furthermore, the company size will affect male workers' upper extremity function, meanwhile matrimony and hobbies influenced female workers (Lundberg, 2002 and Kim *et al.*, 2010). Several previous studies find that females experienced a higher rigorous pain than male dentists. (Chowanadisai, 2000 and Marshall, 1997). It seems as though female gender is prone to musculoskeletal disorders (Lindfors, 2006), and a higher incidence of musculoskeletal pain in young female dentists and pharmacists (Aminian, 2012 and Marshall, 1997). In current study of awareness, author find that majority of respondent aware of age during MSDs will affect the patients. The aged dentists tend to develop MSDs symptoms more than young dentists. Musculoskeletal disorders are typical occurred problems in the elderly (Wolff, 2002). With age, musculoskeletal tissues show increased bone delicacy, reduction of bone and cartilage resilience, decreased ligament elasticity and muscular strength, and fat redistribution decreasing the ability of the tissues to carry out their common occasion (Freemont, 2007). The loss of mobility and physical independence resulting from arthropathy and fractures can be particularly devastating in this population of aged population, not only psychologically and physically, but also in term of enlarged mortality rates (Cheong *et al.*, 2008 and Gheno, 2012).

MSDs in dentist profession and their factors

In current study by author, two questions were asked on factors of MSDs in dentist profession. Most of the respondent are aware on the MSDs in dentist profession, but there are some respondents that still do not aware on basic of the ergonomic dental chair related to the development of MSDs in dentists. Previous study shown the result that can lead to the relation between MSDs and dentist. The study of MSDs in dentist that reported earlier indicate that 91.6% of dentists respondents having at least single type of musculoskeletal symptom during their past 12 months duration of working (Aminian, 2012). The type of symptoms occurred to the dentists in this previous study is shown in Figure 2. Previous study shown that dentists having most of the MSDs symptoms at neck region and upper extremity. There are many factors that can lead to the MSDs in dentists. Two general factors of development of MSDs in dentists are workplace factors and personal factors (Ayatollahi, 2012 and Scully *et al.*, 1990). In dental procedures, the posture of dentist is strained which are while they standing and sitting closely near a patient who may remain sitting or lying down position, which can increase stress injury on MSDs. This may occur in 37.7% of working duration daily (Fasunloro, 2004 and Fish, 1998). There is a correlation between the seated working positions of biomechanics, repeating in unidirectional trunk twisting, prolonged periods in working in one position, flexibility and core strength of operators, proper adjustment of ergonomic equipment by operators, and pain or damaged in physiology (Valachi *et al.*, 2003 and Valachi, 2002). Study shown that preventing protocols in multifactorial problems of dentists that developed MSDs such as posture and malposition and ergonomics consideration is helpful (Valachi, 2003 and Hamann, 2001).

MSD syndromes

Symptoms of syndromes in MSDs are physical indications that indicate further development of disorder in person. Symptoms

can vary and differ based on severity from mild periodic symptoms to severe chronic conditions they develop. It also depend on the amount of person exposure to the factor (Kelsall, 2014). Symptoms occurred before the syndromes, and it appear gradually as muscle fatigue and work pain that disappear during rest. As exposure continues, the symptoms become more severe such as tingling continues even person is at rest, pain and numbness makes person difficult to accomplish the job and at the end the pain is severe that the person is unable to do physical work anymore (Fish, 1998 and Jang, 2006). The symptoms of MSDs are numbness, tingling, burning, aching, pain and stiffness (Scully, 1990 and Fish *et al.*, 1998). Various symptoms lead to the MSDs syndromes. Common syndromes of MSDs are Carpal Tunnel Syndrome, Muscle strains, Carpet layers knee, Raynaud's phenomenon, Trigger finger, Sciatica, Low back pain, Tendonitis, Epicondylitis, Rotator cuff tendonitis, Synovitis and De Quervains' disease (Moldofsky, 1975). Carpal Tunnel Syndrome is most common syndrome happen to person and most synonym with MSDs. It will cause numbness, sensation of tingling, and sometimes pain in the fingers or hand. It gradually develop and start off being worse at night. The thumb, middle and index fingers tend to be affected (Hamann, 2001 and Konz, 1990).

MSDs and its precautions

Precautions in facing the MSDs need to be considered as one of the important things in all occupation. Generally there are 3 types of precautions or control, which are engineering control, work practice control and administrative control (Valachi, 2003; Jäger, 2003; Menzel, 2007 and Waters, 2006). In engineering controls, there is no need for the person to take self-protection or intervention. This type control is most preferred method in MSDs control hazards. It work on the hazards sources and control person exposure to the hazards. Changing, modifying and redesigning the workstations, tools, facilities, equipment, materials and processes are the example of engineering control of MSDs (Menzel, 2007 and Waters, 2006). Work practice controls are the alteration of the way how the job are done or physical work are accomplished in order to decrease the chance of exposure to MSDs hazards. It also work on the hazards sources. The manipulation of the manager behavior, supervisor and employees to the proper ways are the basic aspects in work practice control instead of physical changes to the equipment or workstations. It included the safe and proper work procedures which is understood by managers, supervisors and employees such as recognition of MSDs hazards training and methods to decrease exposure or making task demand easier and less burdens (Jäger, 2003). Administrative controls is constituted with the employer, with the procedures and methods of decreasing daily exposure to MSDs hazards by working ways alteration. Administrative controls include work rotation between employees, enlargement of job task, work pace adjustment, work methods redesigning, alternative tasks and rest breaks (Kim, 2010).

Conclusion

The musculoskeletal disorder is one of the disease that most related to the dentist work. The awareness of MSDs among the dental students is very important to gain knowledge on their basic awareness of this pathology based on their previous and current knowledge in medical field. Moreover, the writer had highlighted the most basic things on symptoms, and dentist

related factors. Based on recent study, the awareness percentage among dental students in Chennai is only 48.55% which is below the minimum percentage of awareness.[3] The rest are having less awareness or least exposure on MSDs and its effect on them is a major factor that contributed to this result. At the end of the discussion, some precautionary aspects such as engineering control, workplace control and administrative control are recommended.

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