



KNOWLEDGE AND AWARENESS OF TEMPOROMANDIBULAR DISORDERS (TMDs) AMONG POST GRADUATE RESIDENTS- A MULTICENTRE RETROSPECTIVE SURVEY

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ABSTRACT

INTRODUCTION: Malocclusion and TMD were believed to have a correlation when it is associated that the alteration of form might cause alteration in the stomatognathic system function. A multidisciplinary approach is particularly important for the successful treatment of chronic TMD cases. Management of TMD involves the work of dentists from various specialities. It is multifactorial in nature and requires proper examination and treatment planning. Thus, the primary purpose of this study is to find out the awareness of TMDs among postgraduate students.

MATERIALS AND METHODOLOGY: The present study was retrospective in nature. A questionnaire involving TMDs was sent to all postgraduates involved in patient treatment through google forms. All participants were asked to anonymously answer the structured questionnaire containing multiple-choice and open-text questions in google forms. The questionnaire was specially developed for students and was organized into three sections.

RESULTS: 204 participants responded and returned the completed questionnaires. Results showed that 98 % of the respondent's occlusal disturbance causes TMD and TMJ problems are associated with malocclusion. The majority of the participants were aware of the aetiology and diagnosis but only 53% of them were aware of the treatment protocols.

CONCLUSION: The causes and diagnosis domains of the questionnaire yielded a high degree of agreement while the treatment modalities were not known. Most of them were not aware of the treatment modalities reason being a lack of knowledge during the course of their undergraduate and postgraduate study.

KEYWORDS: Temporomandibular disorders, Awareness, Post Graduate students, Malocclusion, Diagnosis and Etiology of TMDs.

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INTRODUCTION

The temporomandibular joint (TMJ) forms an integral part of the musculoskeletal system and plays a major role in mastication, phonation and deglutition. It forms a major part of the stomatognathic process controlled by the respective feedback mechanisms comprising of CNS, PNS (Central nervous system, Peripheral nervous system), ligaments, muscles, cartilages, bones and teeth (soft and hard tissue components).^[1]

Malocclusion and Temporomandibular disorders (TMDs) were believed to have a correlation when it was associated with the possibility that the alteration of form might cause an alteration in the stomatognathic system's function.^[2]

TMDs are defined as musculoskeletal disorders that can affect the TMJ, masticatory muscles, and associated dental substructures along with the cervical spine.^[3]

The multifactorial aspects that helps to identify the TMD symptoms and signs in adolescent patients as well as the associated risk factors can help diagnose TMD earlier in all age groups. TMD's can manifest in multiple forms (acute/chronic, simple/complex with associated cognitive, psychosocial, and behavioral factors).^[3] There are various TMDs, out of which myofascial pain dysfunction syndrome (MPDS), internal derangement, ankylosis, and dislocation are the ones which are more commonly reported.^[4]

Treatment of TMDs requires a multidisciplinary approach involving dentists, physical therapists (PTs), speech pathologists, physicians, and psychologists. An ideal treatment option must take into consideration treatment of its associated factors such as parafunctional habits, improper posture, constant pain, inadequate sleep and depression.^[5]

Management of TMDs is multifactorial in nature and requires stringent examination and treatment planning.^[6] It involves specialists from Oral Medicine and Radiology to identify and diagnose the problem, followed by Orthodontists, Prosthodontists, and Oral Surgeons.^[4]

Although a large number of studies have given extensive information regarding TMJ disorders, their awareness is primarily constricted to practitioners and graduated dentists across the world with limited information available regarding their knowledge and awareness amongst pursuing postgraduates and students in India.^[7] Thus, the main aim of the present study was to determine the awareness of TMJ disorders among post graduate students .

MATERIALS AND METHODOLOGY

The present study was a multicenter, retrospective survey conducted for students across various dental colleges. An electronic mode of communication (Google forms, WhatsApp messenger and Mobile phone) was utilized as the study methodology. Sample size calculation was done G Power 3.1 software (At a level of significance set at 5%, power of the study 80% and for an expected effect size difference of 0.413). A total of 200 post graduate students were selected to fulfil the study requirements.

Inclusion criteria : First, Second and Third year post graduate students from Orthodontics Department, Students across India from various Dental Colleges, Age group of 25 years and above.

Exclusion criteria : Undergraduate students, Private Practitioners, Other Specialties.

PILOT STUDY:

In order to validate the questionnaire, the survey forms were sent to 20 general practitioners with a minimum experience of 10 years in clinical practice. Their responses and feedbacks were collected and required changes in the final survey form were made.

SURVEY:

The questionnaire was specially developed for general practitioners and was organized into four sections. In part one gathered information on the dentist's gender, age, university education, working experience, and employment status (private practice, university, substitute, or retired) was included. The second section was about the etiology of TMJ disorders. The third part addressed the methods to diagnosis TMJ disorders and the fourth section contains the treatment modalities.

All participants were asked to anonymously answer the structured questionnaire containing multiple choice and open text questions in electronic media.

A total of 200 postgraduates who were pursuing Orthodontics were included in the study. A cross-sectional study with the given sample was designed and questionnaire was constructed on the Google Forms website with dichotomous responses and multiple-choice questions. The questionnaire comprised of 19 questions grouped into participant's general information, etiology, diagnosis and treatment. An online link containing these questionnaires was shared with all the participants and required them to answer the questions. ^[2,8-11] All the responses were analyzed using percentage evaluation and post-hoc tests were performed after verifying the normality of the samples.

Note: Every answer received one of the four scores (0,1,2,3) based on the participants' response. The questions are attached below.

RESULTS

Table 1: Item wise descriptive statistics for participants’ knowledge on TMDs and occlusion

Item	Strongly agree n(%)	Agree n(%)	Disagree n(%)	Strongly disagree n(%)
Occlusal disturbances cause TMD	106(52)	94(46.1)	4(2)	0(0)
There is a relationship between malocclusion and TMJ problems	114(55.9)	90(44.1)	0(0)	0(0)
Open bite cause TMJ problems	34(16.7)	112(54.9)	42(20.6)	16(7.8)
Both malocclusion and TMD have effects on masticatory functions	100(49)	98(48)	6(2.9)	0(0)
Psychological disturbances, trauma and parafunctional habits cause TMD signs and symptoms	122(59.8)	74(36.3)	8(3.9)	0(0)
TMJ’s are associated with asymmetries	58(28.4)	118(57.8)	18(8.8)	10(4.9)
Examination of masticatory muscles is an important part of TMD diagnosis	84(41.2)	86(42.2)	6(2.9)	28(13.7)
TMD’s the most common causes for Oro facial pain	54(26.5)	124(60.8)	26(12.7)	0(0)
TMD can manifest as headache	44(21.6)	128(62.7)	32(15.7)	0(0)
Measurement of mouth opening is a reliable means of diagnosing TMD	32(15.7)	142(69.6)	30(14.7)	0(0)
Evaluating the number and nature of occluding teeth during protrusion and lateral mandibular movements are a means of occlusal diagnostic methods	34(16.7)	148(72.5)	22(10.8)	0(0)
NSAIDs are helpful in treating TMD	34(16.7)	138(67.6)	24(11.8)	8(4)
TMD patients are referred to specialists other than orthodontist	18(8.8)	122(59.8)	52(25.5)	12(5.9)
Muscle relaxants can be used for treating TMD	38(18.6)	148(72.5)	12(5.9)	6(3)
Occlusal splints are effective in TMD’s	66(32.4)	132(64.7)	2(1)	4(2)
Anterior deprogrammer, Lucia jig , anterior jig are all non -permissive splints	4(2)	18(8.8)	136(66.7)	46(22.5)
Hydrostatic splints work under the principle of pascal’s law	30(14.7)	158(77.5)	8(3.9)	8(3.9)

Table 1 shows the item wise descriptive statistics for participants’ knowledge on TMDs and occlusion. It was observed that all the participants agreed to some level that TMJ problems and malocclusion are associated. Also, 98% of the study subjects agreed that occlusal disturbances cause TMDs. MPDS (10%), ankylosis (4%), clicking (4%) were the most common TMDs reported by the study participants as the most commonly came across problems by them. For another open ended question on to whom they would refer the patients with TMD, majority of participants responded that they would refer to a specialist in Oral Medicine and Radiology followed by Prosthodontics.

Table 2: Differences in knowledge on TMDs and occlusion based on year of post-graduation

Academic year	N	Mean	Std. Deviation	Std. Error	F value	P value
I MDS	50	35.12	4.585	.917	0.137	0.02*
II MDS	58	35.10	3.609	.670		
III MDS	96	35.54	4.212	.608		

One way analysis of variance; $p \leq 0.05$ considered statistically significant

Table 2 shows the differences in knowledge on TMDs and occlusion based on year of post-graduation. III MDS students demonstrated higher mean overall knowledge scores, and the differences between academic years were statistically significant.

Table 3: Multiple pairwise comparisons for differences in knowledge on TMDs and occlusion based on year of post-graduation

Reference group	Comparison group	Mean Difference	P value
I MDS	II MDS	.017	1.000
	III MDS	-.422	0.031*
II MDS	III MDS	-.44	0.027*

One way analysis of variance; $p \leq 0.05$ considered statistically significant

Table 3 shows multiple pairwise comparisons between groups using Tukey's post hoc tests and statistically significant differences were found for I MDS and II MDS students when compared to the III MDS students.

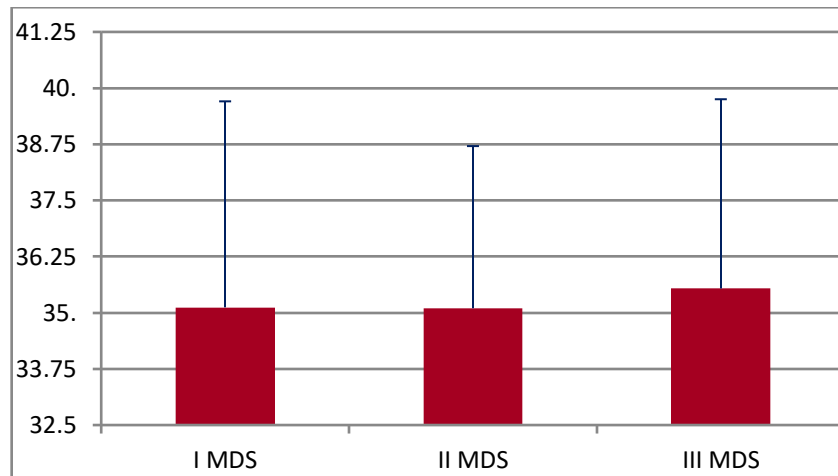
Table 4: Domain wise differences in knowledge on TMDs and occlusion based on year of post-graduation

Domain	Academic year	N	Mean	S.D.	P value
Etiology score	I MDS	50	13.68	2.286	0.041*
	II MDS	58	14.03	1.918	
	III MDS	96	14.10	2.126	
Diagnosis score	I MDS	50	10.28	2.227	0.08
	II MDS	58	10.62	1.821	
	III MDS	96	10.27	1.771	
Treatment score	I MDS	50	11.16	1.993	0.012*
	II MDS	58	10.45	2.277	
	III MDS	96	11.17	1.521	

One way analysis of variance; $p \leq 0.05$ considered statistically significant

Table 4 presents the domain wise differences in knowledge on TMDs and occlusion based on year of post-graduation. Similar scores were observed for I MDS, II MDS, and III MDS students in the diagnosis domain. In the etiology and treatment domains, III MDS students showed significantly higher mean scores.

Figure 1: Differences in knowledge on TMDs and occlusion based on year of post-graduation



Statistical Analysis:

Statistical analysis was performed using IBM SPSS version 20 software (IBM SPSS, IBM Corp., Armonk, NY, USA). Descriptive statistics, one way analysis of variance with Tukey’s post hoc tests were done to analyze the study data.

DISCUSSION

Temporomandibular Disorders (TMDs) are a set of clinical problems with multidisciplinary origin that can affect the masticatory muscles, TMJ, and adjacent structures. The primary etiological factors are parafunctional habits and trauma while stress and mental problems act as secondary aggravating factors in causing TMD. [7]

Based on the diagnosis and the patient's symptoms, TMDs are treated with different approaches, out of which the first line of treatment includes using of medications/ drugs like NSAIDs and steroids, then with passive approaches such as performing physiotherapy modalities (heat, ice, ultrasound, iontophoresis, etc.) or performing jaw stretching exercises. [12] Previous studies were conducted to assess the knowledge and awareness regarding TMJ disorders. Nilsson et al. found in an epidemiological study that approximately 1% of the young population had received some form of TMD treatment, while perceived treatment need was around 2-5%. Lack of knowledge and information regarding the treatment may be one of the reasons for the reduced levels in perceived need. [13]

Ciancaglini and Radaelli performed a survey with 483 subjects to elucidate the inter-relationship between TMD and headache and reported a higher occurrence of headache among individuals with TMD symptoms thus concurring with the experts on the role of TMDs manifesting as a headache. [14] Melo et al in a similar questionnaire study concluded that 70% of the participating dentists erroneously believed that measurement of mouth opening was a reliable means of diagnosing TMD while 84% correctly answered that disc derangement may cause TMJ clicking sounds. [15]

The present study was conducted to assess the awareness of TMDs amongst post graduate students. In this questionnaire, majority of the participants referred patients with TMD to Oral Medicine specialty and Prosthodontics with almost nil or no referral to a Physiotherapist. Although these specialists play a major role in treating TMD's, the results of this study may be due to the reduced awareness about the benefits of physiotherapists among the majority of participants with multiple recent aids such as oral exercises, manual therapy, and postural re-education added to the armamentarium of physiotherapists.

The study indicates that post graduate students need to be more trained about various aspects of etiology, diagnosis and treatment modalities of TMD's. The results for factors affecting etiology had a response of strongly agree and agree of 55% to 4 out of 6 questions and the rest of only 16%, while the diagnosis had a 25% strongly agree and 60% agree for 4 out of 5 questions. These findings are similar to the study conducted by Aravinth Rajkumar Govindaraj et al whose survey is to find out the awareness among dentists and dental students regarding the relationship between TMDs and malocclusion. Out of 119 responses, 91.6% were aware and rest of the 8.5% were not aware of the same and the difference in subjects aware and not aware was statistically very significant. [4]

The treatment part had an overall least score for strongly agree of 18% and an agree option of 68%. In all the three domains strongly disagree and disagree options were almost 28% altogether with an only exception of one question in treatment domain having a percentage of 45% of disagreement.

The above percentages clearly depicted that although the post graduate students were aware that occlusion and TMD's are interrelated, they were not able to come to a strong opinion of the given options. III MDS students demonstrated higher mean overall knowledge scores, and the differences between academic years were statistically significant.

Finally, 98% of the study subjects agreed that occlusal disturbances cause TMDs. MPDS (10%), ankylosis (4%), clicking (4%) were the most common TMDs reported by the study participants as the most commonly came across problems by them. Which is similar to a study by Muthu Krishnan and Sekar et al that showed the prevalence, so symptoms of various TMD's in his study stated that there are signs and symptoms of MPDS in 0.8% of the population, apart from MPDS he had also the signs of internal derangement in 38.3%, and osteoarthritis in about 14.6% of the population of the total samples taken into the study. ^[16] Finally for another open-ended question on to whom they would refer the patients with TMD, majority of participants responded that they would refer to a specialist in Oral Medicine and Radiology followed by Prosthodontics while least to none preferred Orthodontics as a choice for the reason being lack of awareness among them regarding the integrative approach^[17-18].

Thus, based on the results of this study, management of TMD's involves a multidisciplinary line of action. Although our present study has a limitation of assessing only orthodontic postgraduates, it is of utmost priority for all the specialties to train their postgraduates in these domains from the very beginning.

CONCLUSION

Majority of the dental students within the study were aware of the TMJ disorders and its relationship with malocclusions. The causes and diagnosis domains of the questionnaire yielded a high degree of agreement while the treatment modalities were not known. Most of them were not aware of the treatment modalities with the chief reason being lack of knowledge during the course of their undergraduate and post graduate study. Thus, in treatment planning and pain management domains, there was considerable disagreement between them. Another important aspect of analysis was made regarding the choice of department to refer which showed that most of the participants were referring their patients to Oral medicine and Prosthodontics and not Orthodontics. Most of the post graduate students agreed that orthodontic treatment is linked with TMD disorders.

CONFLICT OF INTEREST

The authors have no conflict of interests to declare.

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