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Knowledge and Attitudes Regarding Temporomandibular Disorders among Postgraduate Dental Students and Practicing Dentists in Maharashtra: A Questionnaire-Based Survey

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Abstract

Objective

To assess the awareness, diagnostic approaches, and management strategies related to TMD among postgraduate dental students and practicing dentists at graduate level in Maharashtra.

Methods

A cross-sectional observational study was conducted from November 20, 2024 to January 2, 2025 using a structured questionnaire distributed online to postgraduate students and practicing dentists in Maharashtra. The questionnaire assessed participants' knowledge of TMD etiology, clinical symptoms, diagnostic methods, and treatment approaches. A total of 268 participants including 125 practicing dentists at graduate level and 143 postgraduate students completed the survey.

Results

The study revealed significant differences in TMD awareness between postgraduate students and practicing dentist. 57.39% of postgraduate students often suspected TMD, compared to 44% of practicing dentist. Parafunctional habits and psychological factors were more frequently identified as etiological factors by postgraduates. Nine statements in etiology, diagnosis, treatment, and prognosis of TMD had different consensus between the two groups. While diagnostic approaches were consistent, gaps were identified in recognizing etiological factors, the role of psychological contributors, and the association between TMD and tinnitus.

Conclusion

The study highlights critical gaps in the understanding and management of TMD among dental practitioners and postgraduate students. This discrepancy points to the need for comprehensive educational programs emphasizing the multifactorial nature of TMD.

Keywords: Temporomandibular Disorders (TMD), Orofacial Pain, TMD Diagnosis, Psychological Factors, Musculoskeletal Disorders, Knowledge, Practicing Dentists

Introduction

Temporomandibular disorders (TMD) this are the most common musculoskeletal disease affecting temporomandibular joint. The American Academy of Orofacial Pain (AAOP) defines it as, “a collective term that embraces a number of clinical problems that involve the masticatory muscles, the TMJ, and the associated structures [1].” TMD includes an abnormality of positioning or structure of the intra-articular disc and problems with the muscles that control jaw movement [2]. The aetiology of TMD is multifactorial and includes combination of psychological, physiological, structural, postural and genetic factors that alters the functional balance between the components of TMJ. Occlusal overloading and parafunctional habits are common biomechanical factors, while stress, anxiety, and depression are psychosocial factors involved in TMD [3].

About 60-70% of general population experienced at least one sign TMD but only one out of four individuals are aware of this. The most important symptoms in TMD are pain in TMJ and masticatory muscles, restricted jaw movements, noises from TMJ during jaw movements. While other symptoms such as headache, pain in and around the ears are also reported [4].

The etiopathogenesis of this condition is poorly understood, therefore a multidisciplinary approach in TMD diagnosis and treatment is crucial and may involve dentists, physical therapists, speech pathologists, physicians, and psychologist [5].

A thorough understanding of the multifactorial aetiology and consistency in the management of TMD is important. However, the diagnosis and treatment methodology vary considerably among practitioners. The current research project was directed to determine the knowledge and awareness about TMDs among practicing dentist and postgraduate students of Maharashtra.

Methods

Study design and setting

This observational, cross-sectional study was conducted from November 20, 2024, to January 20, 2025, using convenience sampling. An online questionnaire was sent to practicing dentists and postgraduate students in Maharashtra, India.

Sample Size:

Formula used

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{E^2}$$

n = 265 (rounding up to the nearest whole number).

Questionnaire: The questionnaire included both closed and open-ended questions. The first section collected general information such as age, gender, education level, years of practice, specialty, and prior TMD training. The second section had 10 questions covering:

- 5 questions on self-assessed knowledge of TMD diagnosis, treatment, and education.
- 2 questions on TMD patient population and referrals.
- 3 questions on TMD causes and symptoms.

Four questions were answered on a 6-point scale, where 1 represents "strongly agree," 2 represents "agree," 3 represents "neutral," 4 represents "disagree," 5 represents "strongly disagree," and 6 represents "I don't know."

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS Version 23. Categorical variables were expressed as frequencies and percentages, while continuous variables were reported as means and standard deviations. Chi-square, Fisher's exact, and Mann-Whitney tests were used to compare knowledge between practicing dentists and postgraduate students. Quantile regression was applied to analyze score differences.

Result and Discussion

Total 268 participants, including 125 practicing dentists at graduate level and 143 post-graduates. Total 83 males and 185 females were enrolled in study. The age range of most of the participants were 25-30 years with years of practice were less than 5 years. In total, only 27.1% of the participants had attended TMD courses/training before.

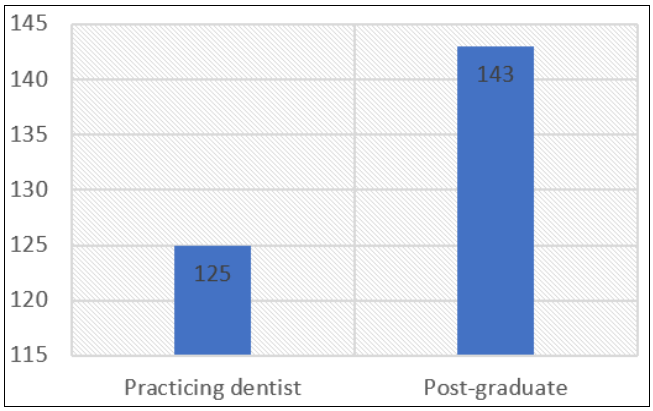

Chart 1: Total practicing dentist and postgraduate participants

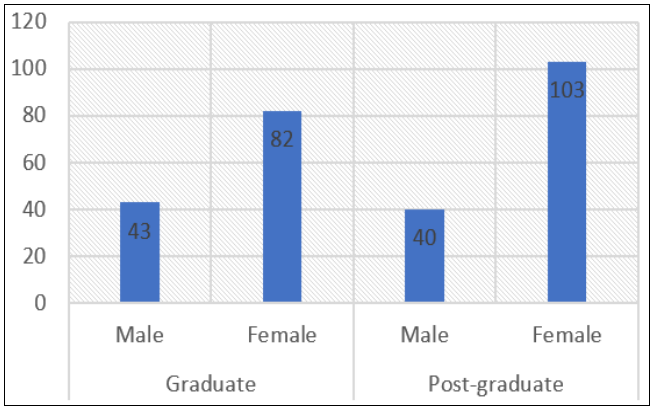

Chart 2: Gender of the participants

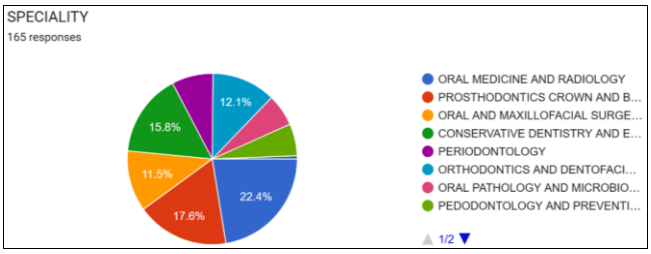

Chart 3: Speciality of postgraduate participants

TMD population and diagnostic procedure

The findings reveal significant differences in the frequency of temporomandibular disorder (TMD) suspicion between practicing dentist(graduate) and post-graduate groups. 47.2% of the practicing dentist rarely suspecting TMD in patients, with 44% indicating that they often suspect TMD. Conversely, the post-graduate group demonstrated a higher degree of TMD suspicion, with 57.39% often suspecting TMD. This pattern suggests a relatively lower level of clinical suspicion for TMD among practicing dentist participants, potentially reflecting limited exposure to TMD cases or less comprehensive training in recognizing its symptoms. Additionally, the data suggests that while post-graduate participants are more likely to suspect TMD, there is still a notable portion (42%) that rarely suspects it. This indicates the need for continued emphasis on TMD education. (Chart 4 and 5)

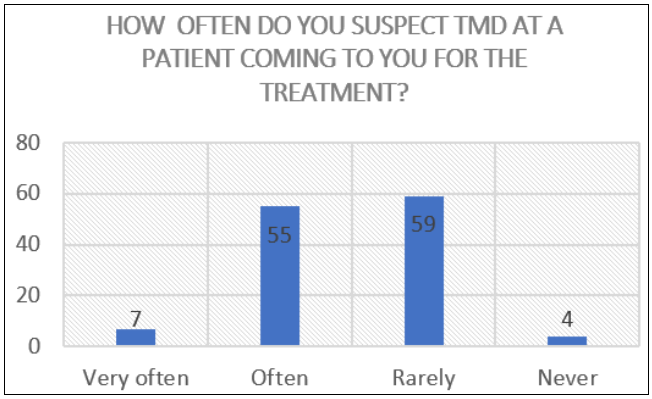

Chart 4: Practicing dentist responses

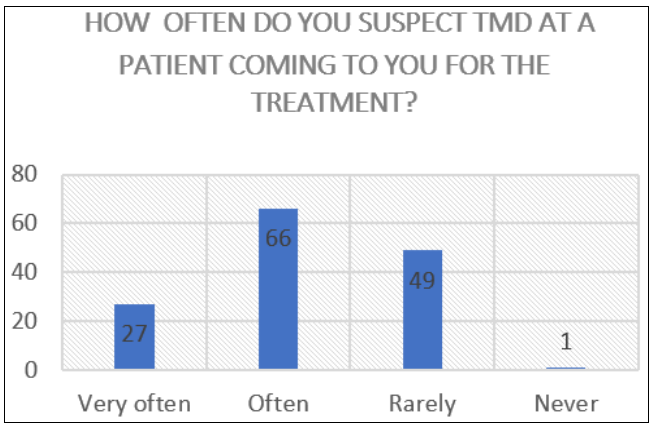

Chart 5: Post-graduate responses

Both groups identified a combination of medical history, physical examination, and imaging as essential for diagnosing TMD. Accurate diagnosis is critical for clinicians and patients, as delays or missed diagnoses can worsen symptoms and negatively impact quality of life. The diagnosis of TMD starts with detailed patient's history followed by detailed clinical examination, identifying familiar pain when palpating the TMJ and Muscles of mastication, imaging studies to confirms structural involvement [6]. The recently developed evidence-based The Diagnostic Criteria for TMD (DC/TMD) is a recently developed, evidence-based protocol suitable for both clinical and research applications. This system uses a dual-axis approach, classifying patients by clinical findings (Axis I) and psychosocial factors (Axis II), with psychosocial status evaluated through standardized psychometric tools. This comprehensive method enhances the accuracy and consistency of TMD diagnosis and management [7].

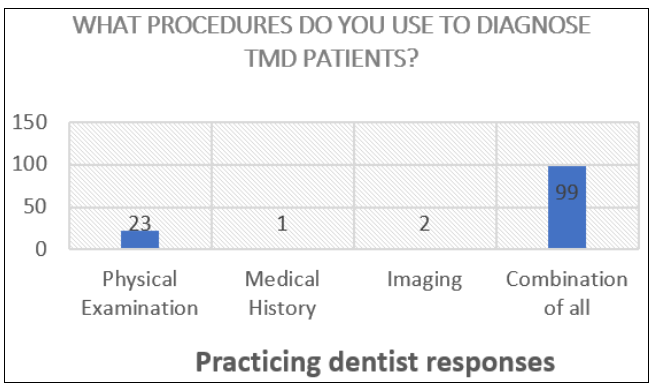

Chart 6: Practicing dentist responses

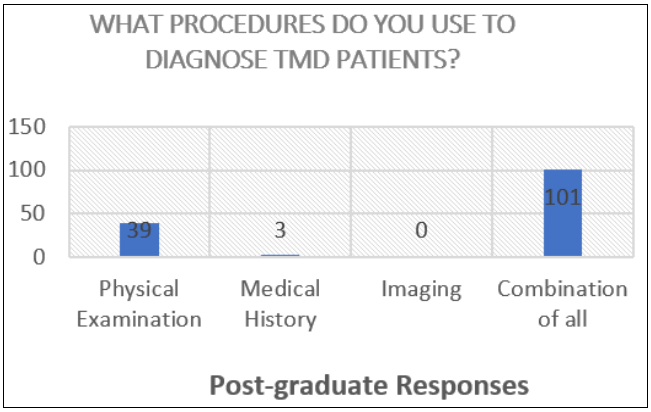

Chart 7: Post-graduate Responses

Etiological factors in TMD

The etiology of TMD is complex and multifactorial. The factors are mainly grouped into three categories, predisposing factors (pathophysiological, psychological or structural processes that alter the masticatory system) increase the risk of developing TMD, events such as trauma or excessive load on the masticatory system trigger the onset of TMD, and perpetuating factors that hinder recovery or contribute to the progression of TMD [3].

One of the most controversial factors in TMD is occlusion. Pullinger and Seligman conducted a multiple factor analysis, showing a low correlation between occlusion and TMD. They concluded that malocclusion act as a co-factor in actor or consequence of the disorder rather than a primary cause [8]. Badel *et al*. noted that hyperbalance and interference contacts were more common in asymptomatic patients than in those with TMD. No significant differences were found between Angle's classes in TMD and asymptomatic patients [9]. The psychological and psychosocial factors are of great importance in the understanding of TMD, but there is less evidence that these factors are etiologic [10]. Studies highlight a strong association between bruxism and TMD, with 87.5% of patients with disc displacement and joint pain exhibiting bruxism [11].

In this study, participants were asked to identify the most common causes of TMD. Responses with more than two selections were excluded. Practicing dentists most frequently cited parafunctional habits and improper chewing, followed by malocclusion and occlusal interference. Psychological factors, missing teeth, and trauma were selected less often.

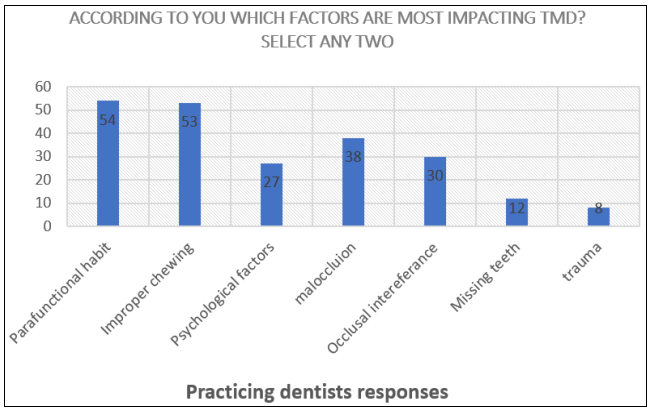

Chart 8: Practicing dentist responses for the etiological factors in TMD

Postgraduate participants also highlighted parafunctional habits and improper chewing as primary causes but placed greater emphasis on psychological factors. Occlusal interference was another common selection, while malocclusion, missing teeth, and trauma were less frequently identified. The greater focus on psychological factors among postgraduates reflects their broader knowledge and experience with TMD.

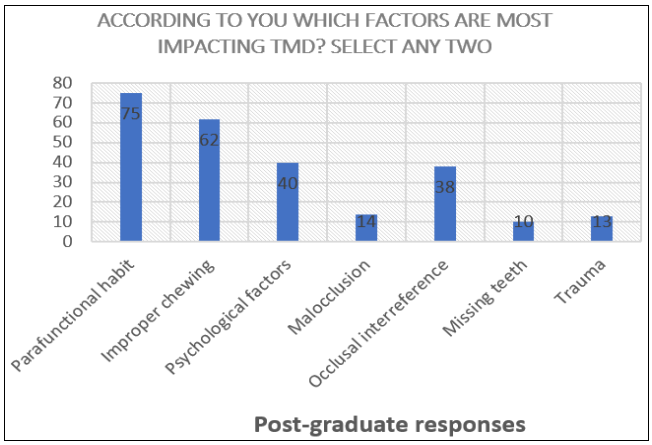

Chart 9: Post-graduate responses for the etiological factors in TMD

Clinical Symptoms in TMDS

The primary signs and symptoms associated with temporomandibular disorders originate from the masticatory structures and are associated with jaw function. Pain during opening of the mouth or chewing is common. Some individuals report difficulty speaking or singing. Patients often report pain in the preauricular areas, face, and/or temples

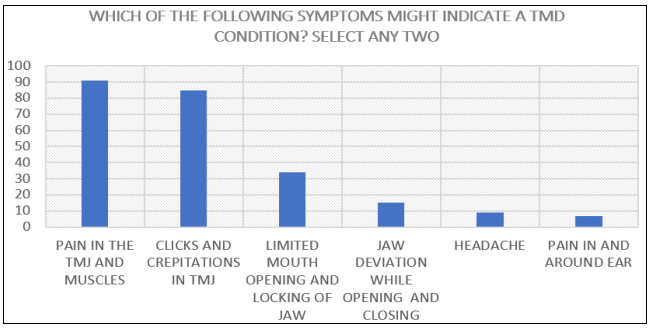

Chart 10: Practicing dentist responses for the Clinical Symptoms in TMD

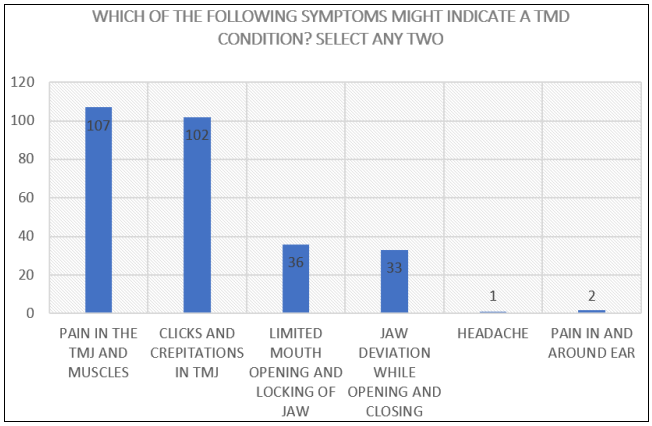

Chart 11: Post-graduate responses for the Clinical

Psychological factors in TMD

The relationship between psychological factors and TMD is multidirectional and complex. It is believed that the disorders related to stress, anxiety and depression intensify the parafunctional activity that may lead to the emergence or exacerbation of TMD [12].

In the present study, participants were asked about the relation between psychological factors and TMD. In practicing dentists group, only 24(19.2%) of the participants were knowing about the association while in postgraduates, 57(39.8%) of the participants agreed on the association between factors. The neutral response from 35.2% of practicing dentists, points towards uncertainty or a lack of conclusive evidence available. A significant portion of postgraduate, 24.47% marked a neutral responce, demonstrating that ambiguity persists even among postgraduates. The differences observed between the two groups could be attributed to the varying levels of academic exposure, and clinical experiences.

Overall, these findings suggest a need to integrate more comprehensive education on the psychological components of TMD, to identify the patients with an increased risk of chronic painful TMD. Special attention must be given to individuals with depression and catastrophizing tendency, because in this group of patients TMD, and especially its muscle-related form, is observed most frequently.

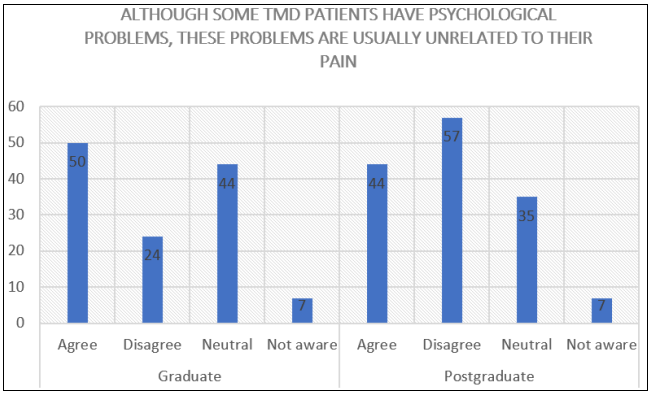

Chart 12: Responses on the association of psychological factors and TMD

Tinnitus and TMD

There is increasing evidences of showing association of tinnitus and TMD. Research has shown that the prevalence of temporomandibular joint (TMJ) complaints is higher in individuals with severe tinnitus (36%) compared to those with milder or general tinnitus (19%). This strong correlation suggests that TMJ problems can exacerbate tinnitus severity. Additionally, subjects with TMJ complaints tend to be predominantly women, report stress as a contributing factor to tinnitus, and experience more severe tinnitus-related distress [13].

When participants were asked whether TMJ disorders can cause tinnitus, 54.4% of graduates and 79.9% of postgraduates agreed with the statement, reinforcing the acknowledgment of a potential link between the two conditions. The higher agreement among postgraduates may reflect greater clinical exposure and advanced education that underscores the comorbidity between TMJ disorders and tinnitus. However, 28% of graduates and 14.6% of postgraduates selected a neutral response, suggesting a lack of definitive understanding between the two.

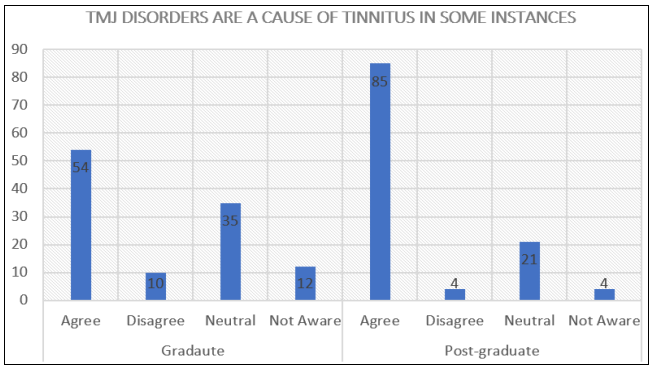

Chart 13: Responses on the association of tinnitus and TMD

Management of TMJ Clicking

TMJ clicking is not a serious condition unless it causes pain. The condition is more common in adults due to clenching of jaws and grinding of teeth. Stress is more often seen in young adults; this sort of stress leads them to unconsciously grind teeth and aggressively occlude the jaws as a result of the hyperactivity of mastication muscles. The choice of treatment in TMJ clicking ranges from conservative including soft diet and analgesics medication. If the conservative management fails a soft stabilization splint (SSS) is use as a second option for a period of over six months. Followed by the third option; physiotherapy and/or acupuncture. Stress reduction therapy could be of benefit for young adults [14]. TENS therapy is an adjutant modality in the management of pain associated with TMD. It is a safe, non-invasive, effective, and swift method of analgesia, and the potential adverse reactions of other methods of pain control are eliminated [15].

Participants were asked about the approaches for the TMJ clicking; 12.8% of graduates and 14.4% of postgraduates agreed on the statement of TMJ clicking does not required treatment unless it is symptomatic followed by conservative and pharmacological management.

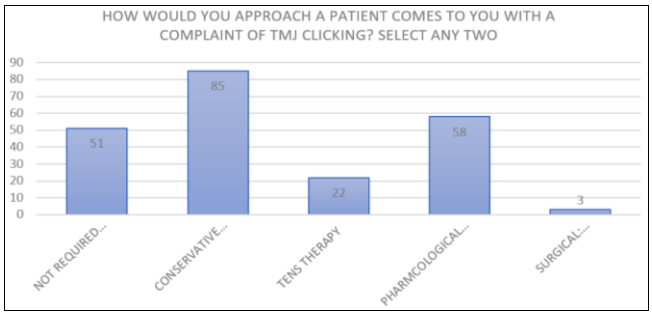

Chart 14: Practicing dentist responses on the management of TMJ clicking

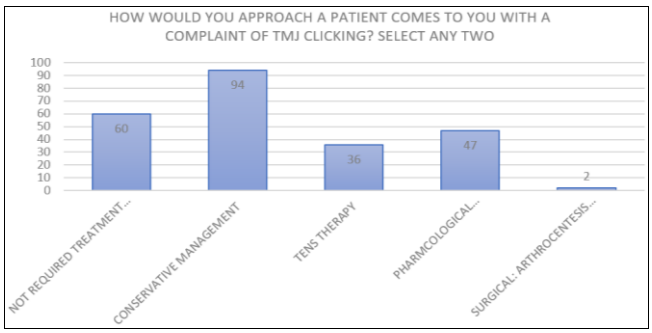

Chart 15: Post-graduate responses on the management of TMJ clicking

Preferred Treatment modalities in TMD

The management of TMD is complicated and requires specific knowledge about multifactorial pathogenesis and therapeutic difficulties of TMD. The most important stage of treatment protocol is education and awareness about the background of the disorder. The conservative management starts with therapeutic exercises such as muscular training to strengthen the muscles and to acquire balance between right and left side. Massage and manual therapy is used to re-establish flexibility, muscular length and relieves pain [16].

Occlusal splints are used to achieve proper relation of the jaw by restoring the centric relation. Both the anterior repositioning splint and hard stabilization splints are effective in the management of TMD. This device disengages the occlusion, so that the condyle is place in centric position which again relaxes the masticatory muscles and prevent further tooth wear due to nocturnal parafunctional activity [14].

Physiotherapeutic techniques such as biofeedback, ultrasound and TENS therapy are well documented in the management of TMD. The purpose of biofeedback is to achieve maximum relaxation of the muscles for the short period of time. TENS therapy is a well-known method for pain reduction. It reduces the pain by electrical stimulation of pain areas [16].

Pharmacotherapy is indicated when other somatic symptoms such as such as sleep disorders, chronic pain, arthralgias, inflammatory diseases, myalgias or neuropathies are associated with TMD. Pharmacotherapy can be considered as a complementary therapy rather than a treatment itself. The following drugs can generally be used: Analgesics, nonsteroidal anti-inflammatory drugs (NSAIDs), muscle relaxants, tricyclic antidepressants, corticoids, sleep-inducing and sedative drugs like benzodiazepines and their newer derivatives [17].

Behavioral therapy is non-invasive and reversible method of pain control which also improves the functional and affective impairment associated with TMD. This therapy includes several methods and procedures such as relaxation, cognitive-behavioral techniques and self-management.

The new care concept was born: Multidisciplinary or multimodal approach to overcome the challenges faced by the clinician due the complexity of TMD [18].

Arthrocentesis and arthroscopy are the minimally invasive surgical procedure used in TMD. The clinical impact of this procedures is comparable to non-surgical procedure.

In the present study participants were asked to select two preferred treatment modalities used in TMD patients. Both the graduate and post-graduate group have marked conservative management (including hot compresses and physiotherapy) and occlusal splint therapy. Followed by Behavioral and multimodal therapy, acupuncture and TENS therapy. Arthrocentesis and arthroscopy are the less preferred methods in in both the groups.

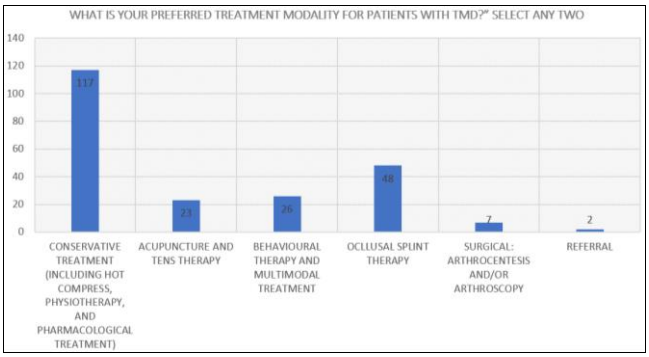

Chart 16: Response of the practicing dentist for the Management of TMDS

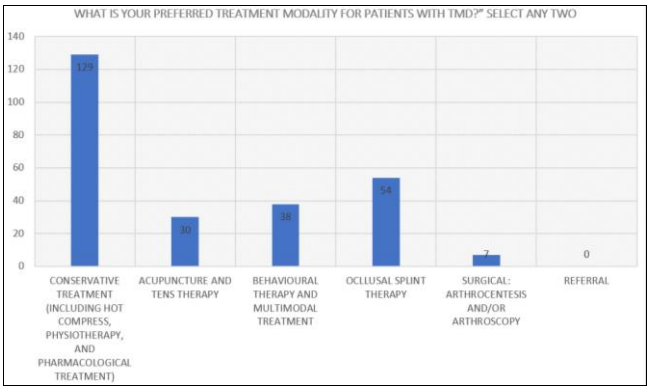

Chart 17: Post-graduate responses for the Management of TMD

Referral specialty

Participants were asked the referred specialty; 48.8% of participants refer the patient to Oral medicine and radiology. 34% refer their patients to Maxillofacial surgeon followed by 6.3% to prosthodontist, 5.2% to orthodontist.

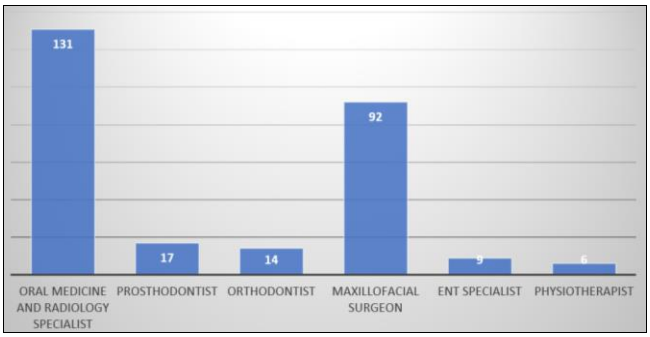

Chart 18: Referred specialty by practicing dentist

Conclusion

The study highlights critical gaps in the understanding and management of TMD among dental practitioners and postgraduate students in Maharashtra. Although postgraduate students exhibited a higher level of clinical suspicion and knowledge, substantial portions of both groups demonstrated limited awareness of key etiological and psychological factors. This discrepancy points to the need for comprehensive educational programs emphasizing the multifactorial nature of TMD and its psychosocial dimensions.

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