

## Conservative Treatment Modalities in The Management of Temporomandibular Joint Disorders

Research Article

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### Abstract

Temporomandibular joint disorders (TMD) are diseases that affect the temporomandibular joint and the supporting structures. The goal of treatment for temporomandibular disorders is the elimination of pain and return to its normal function. The aim of this study was to determine the various conservative treatment modalities done for patients with temporomandibular disorders visiting saveetha Dental College. This retrospective study included data of 55 subjects who reported to Saveetha Dental College and diagnosed with TMD during June 2019 - March 2020. Descriptive (Frequency, mean) and Inferential statistics (chi square test) were employed Using SPSS software. Level of significance was set at  $p < 0.05$ . The most common age for TMD disorders according to this study was 31-40 years of age (24%). Males had a higher prevalence of TMD. Muscle relaxants and hot massages were the most preferred conservative treatment modalities. However, on comparing, results were statistically insignificant for association between TMD and physical therapy ( $p > 0.05$ ); and association between TMD and pharmacotherapy ( $p > 0.05$ ). Within, the limits of the study, hot massage and muscle relaxants were most preferred conservative treatment modalities in the management of TMDs. TMD mostly affects the males of the age group 31-40 years. Disc-dysplasia was the common type of TMD in our study. Thus, non-invasive treatment modalities can be advised as the first line of treatment for TMDs.

**Keywords:** Pain; Pharmacotherapy; Physical Therapy; Temporomandibular Joint Disorders; Treatment.

### Introduction

Temporomandibular disorders (TMD's) refer to the causes responsible for the impaired function of the temporomandibular joint and the associated neuromuscular system which may provoke TMD related pain [1]. The TMJ is used about 1500-2000 times a day, which shows how great discomfort is carried by the pathologies in jaw movements [2]. The term TMD is not a diagnosis but rather a broad term that contains a number of disorder entities, such as pain in masticatory muscles and temporomandibular joints (TMJ).

Basically, TMJ disorders are classified into three distinct entities: Muscle disorders, joint derangement and degenerative joint disorders.

Muscle disorders: Muscles that control the movement and position of the jaw and disorders of these muscles causes pain. Eg. MPDS. Joint derangement: Disc can get displaced in the joint leading to internal derangement of the joint. Almost 25 percent of the entire population of TMD, suffer from internal derangement [3]. Joint degenerative disorders: This involves the bone degeneration around the joint eg. osteoarthritis.

TMD's are mostly symptomatic and their etiological agents are numerous that include trauma, systemic diseases, iatrogenic, occlusal and mental health disorders etc [4-6]. Currently, mental health plays a dominating role in the pathogenesis of TMD [7]. The TMD pain and symptoms can range from sensitivity or discomfort to the worst pain possible. It might affect the quality of life of the patient on various levels. It may interfere with activities

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of daily food intake, living, work performance, and even reduce the quality of sleep. The nature of pain is usually not localized and it can radiate to different regions such as the dental arches, ears, temples, forehead, occipital and cervical region [8]. It is most commonly noticed that people report to the dentist for toothache, but the offending etiology could be TMD's. TMD can even affect the tooth structure leading to non-carious tooth lesions (abfraction/abrasion). This is because there is an increased tension in the TMJ muscles and co-existing parafunction or dysfunction might be a contributing factor [9, 10].

The treatment of TMD is complicated and requires specific knowledge and exercises to strengthen some groups of muscles. Although the treatment seems difficult, initially an accurate diagnosis needs to be made to start the proper protocol of treatment [11]. Yet, it is very important to note that treating TMD only from the dental perspective may fail completely, as many of these disorders are associated with musculoskeletal complexes that should be cured in the first place [12, 13]. There are several treatment possibilities for patients with TMDs which may be conservative or invasive as found in literature. However, the treatment is not standardized due to the different etiologies and the distinct structures that might get affected. Nevertheless, the initial treatment is non-invasive and conservative not surgical management.

As a general rule, the treatment approach is multidisciplinary consisting of dentists, orthodontists, psychologists, physical therapists and neuro-physicians. More conservative treatment approaches are being widely used such as counselling, dietary modifications, physical therapy, pharmacotherapy and intraoral occlusal appliances. In patients with myogenous types of TMD respond favourably to conservative treatment compared to others [14].

The management goals are similar to those of other orthopedic conditions, namely, reduction of pain, reduction of adverse loading, improvement of function, and restoration of normal, daily activities. The emphasis should be on conservative therapy that it facilitates the musculoskeletal system's natural healing capacity and helps the patient in the physical management of their own problem.

Previously our college had conducted numerous surveys [15-18] and clinical trials [19-22] over the past five years. Now we are focusing on original research. The idea for this study stemmed from the current knowledge of TMD among our population. Thus, this study aims at evaluating the different conservative modalities advocated to the patients visiting Saveetha Dental College, Chennai who were diagnosed with temporomandibular joint disorders.

## Materials And Methods

### Study design and Study setting

This retrospective cross-sectional study was conducted in the department of oral and maxillofacial surgery, Saveetha dental college and hospital, Saveetha university, Chennai, among patients who reported to our institution from June 2019 to March 2020 and were diagnosed with TMD. The study was initiated after approval from the institutional review board.

### Study population and sampling

Digital case records of 86,000 patients who reported to saveetha dental college from June 2019 to March 2020 were reviewed and all the patients diagnosed with TMDs were included in the study. Thus, our study sample consisted of 55 patients diagnosed with TMD. The exclusion criteria was missing or incomplete data. Cross verification of data for errors was done with the help of an external examiner.

### Data Collection

All relevant data was collected from digital case records by a single calibrated examiner which included age, gender, type of TMD disorder, and various conservative treatment options given to the TMD patients.

### Statistical analysis

The collected data was validated, tabulated and analyzed with Statistical Package for Social Sciences for Windows, version 20.0 (SPSS Inc., Chicago, IL, USA) and results were obtained. Categorical variables were expressed in frequency and percentage; and continuous variables in mean and standard deviation. Chi-square test was used to test associations between categorical variables. P value < 0.05 was considered statistically significant.

## Results And Discussion

According to our study, among the 55 TMD subjects whose case sheets were analyzed it was seen that the most common age group for TMD was 31-40 years of age (24%) [Figure 1] with a male predilection (28%) [Figure 2]. Disc-condyle disorder was the most common clinical category according to this study (34%) followed by MPDS (19%) [Figure 3].

Both physical therapy and pharmacotherapy was advised for the patients. Hot massages (32%) were the most common physical therapy followed by dietary modifications (11%) and Jaw stretching exercise was the least preferred. [Figure 4] Muscle relaxants were the most commonly preferred pharmacological agent in patients with TMD. [Figure 5].

Disc condyle disorder was prevalent among all age groups except 51-60 years of age and the results were not statistically significant. ( $p=0.13$ ) [Figure 6]. Disc condyle disorder was the most common type of TMD among both males and females and the results were not statically significant ( $p=0.22$ ) [Figure 7]

Hot massage was the commonly preferred physical treatment for all TMD and the results were statistically insignificant ( $p=0.76$ ) [Figure 8] Muscle relaxants were mostly preferred for MPDS and disc-condyle disorder; analgesics were preferred for degenerative disorders and the results were statistically insignificant ( $p=0.1$ ) [Figure 9].

According to the results of this study, it is seen that mid age groups and females were mostly affected. Conservative treatment modalities such as hot massage and muscle relaxants were mostly preferred for TMD.

Figure 1. Bar graph depicting age wise distribution of TMD in. X- axis shows the age of the patient and Y- axis shows the number of patients with TMD. Higher prevalence of TMD is seen in the 31-40 years of age (43.64%).

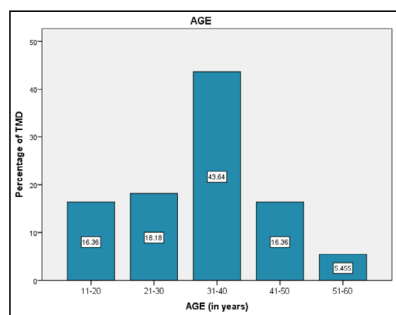


Figure 2. Bar graph depicting gender wise distribution of TMD. X- axis shows the gender of the patient and Y- axis shows the number of patients with TMD. slightly higher predilection of TMD is seen in the males (50.91%) compared to females (49.09%).

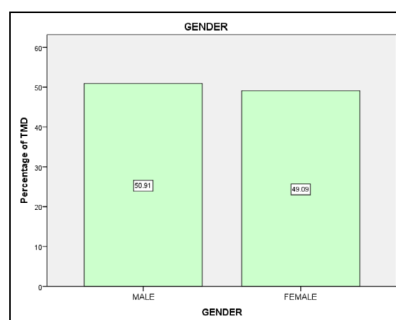


Figure 3. Bar graph depicting distribution of TMD. X- axis shows the category of the TMD disorder and Y- axis shows the number of patients with TMD. Disc-condyle disorder (60%) was the commonest type of TMD followed by MPDS (36.36%).

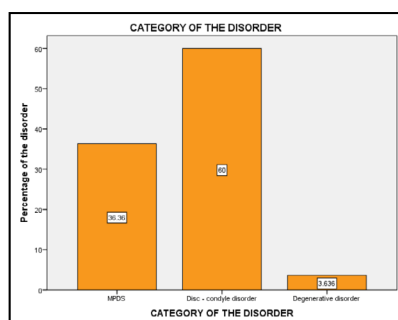
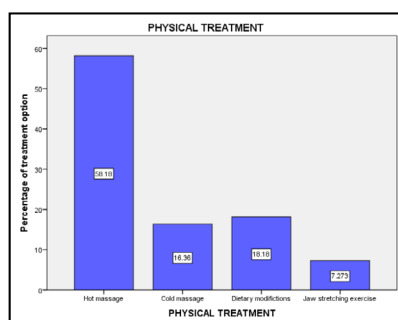


Figure 4. Bar graph depicting distribution of physical treatment for TMD. X- axis shows physical treatment and Y- axis shows the number of TMD patients receiving treatment. Hot massages (58.1%) were the mostly advised therapy for TMD.



This study found that 31-40 years of age was the most prevalent age for TMD. However, other studies [23, 24] reported that TMD was most common above 65 years of age. This finding is because at an older age group are much concerned about their health status and report to the doctor. Moreover, it can be that the subjective complaint also increases as the study population ages and the demand for treatment increases accordingly. Also, the current finding is contradictory to the previous studies. This is because of the small sample size taken into account for this study.

Studies [25-27] reported that females had a higher predilection for TMD's. But this is contradictory to the results of our study which reports that males had a higher prevalence. Prior researches revealed certain factors that might have contributed to such sex variations include hormonal, blood pressure, and psychological factors [28]. Also pain tolerance rate is found to be higher in males compared to females [29].

Conservative treatment for TMD is the most preferred modal-

Figure 5. Bar graph depicting percentage distribution of pharmacotherapy for TMD. X- axis shows pharmacotherapy modalities and Y- axis shows the number of TMD patients receiving treatment. It is evident from the graph that muscle relaxants (61.82%) were the most commonly prescribed agents for TMD.

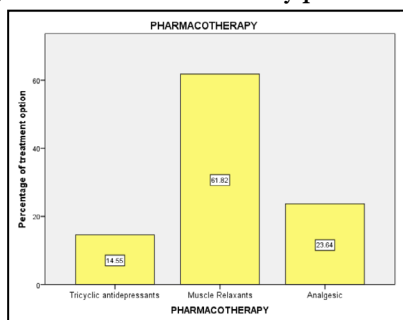


Figure 6. Bar graph depicting the association between age and TMD. X-axis indicates the age and Y axis indicates the number of patients with TMD. Disc- condyle disorder is the most common disorder among patients of all age groups and the results were statistically not significant. (Chi square test,  $p=0.13(>0.05)$ ).

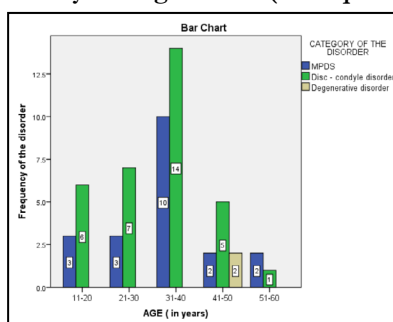


Figure 7. Bar graph depicting the association between gender and TMD. X-axis indicates the gender and Y - axis indicates the number of patients with TMD. Disc- condyle disorder is the most common among males and females and the results were statistically not significant. (Chi square test,  $p=0.22 (>0.05)$ ).

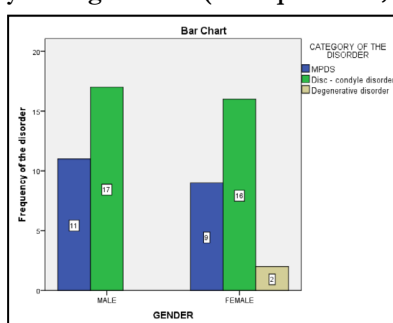
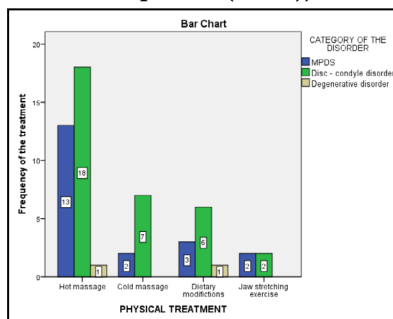


Figure 8. Bar graph depicting the association between Physical therapy and TMD. X-axis indicates the physical treatment and Y - axis indicates the number of patients with TMD. Hot massage is the most common type of physical therapy given for the patient with disc-condyle disorder and MPDS. However, the results were statistically not significant. (Chi square test,  $p=0.76 (>0.05)$ ).

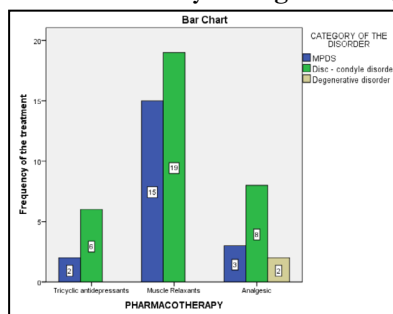


ity [30]. In this study hot massage along with muscle relaxants was the most common non-invasive or first line of treatment for TMD. Also, the usage of occlusal splints has not been justified in this study.

According to de Toledo et al and Agarwal [31, 32] a positive cor-

relation exists between TMD and physical therapy. This is in disagreement with our study. This might be because of the geographical variation and smaller sample size included in the study. Physiotherapy modalities used separately or in combination with other options contributed to pain relief. Moreover, guidelines for physical therapy at home like hot massage, cold massage etc might

**Figure 9. Bar graph depicting the association between Pharmacotherapy and TMD. X-axis indicates pharmacotherapy and Y-axis indicates the number of patients with TMD. Muscle relaxants are the most preferred agent for disc condyle disorder and MPDS. However, the results were statistically not significant. (Chi square test,  $p=0.10 (>0.05)$ ).**



be very useful for pain relief. Massage therapy for TMD leads to re-establishing the proper flexibility and muscular length and relieves pain. Massage reduces tissue swelling as well as pain in TMD patients. The pressure used during massage should not be too intense. Modification of diet such as a soft diet can also influence pain reduction. Jaw stretching exercises can be the best mode to achieve muscle restoration especially after minor trauma and injuries. Similarly, it is thought to be of much significance in TMD disorders.

A study [33] reported that pharmacotherapy is the most significant choice of treatment with TMD. The etiological agents to be considered before prescribing the drug. One has to remember that pharmacotherapy has its goal in decreasing pain and inflammation within the joint and/or muscles. This therapy improves function and inhibits the progression of the disease. Pharmacotherapy can be considered as a complementary therapy rather than a treatment itself. However, it is an exception when systemic diseases are associated with TMJ involvement. Muscle relaxants (baclofen, tizanidine, cyclobenzaprine), opiates (morphine), anti-convulsants (e.g. gabapentin), ketamine, and TCA (e.g. amitriptyline) have also been used clinically for TMJ management. To achieve the myorelaxation effect with low CNS impact, metaxalone is recommended (average daily dose of 800 mg) [34]. In chronic pain, apart from analgesics which are used for pain relief [35], antidepressants should be considered as a supplementary treatment [36]. Antidepressants may be used for chronic pain as a primary analgesic. These medications manage pain, reducing the feeling of depression caused by pain and improving sleep quality of the patient. Currently, botulinum toxin has an emerging role in treatment of TMD. It has been shown that BTX injections can be the least invasive mode, which can provide relief of intractable symptoms in patients who have failed to show any improvement with the conventional modalities of treatment [37].

Dentists must learn to correctly diagnose and properly treat acute orofacial pain conditions with practical, cost-effective, and evidence-based approaches. Acute pain management is necessary to prevent an acute condition from becoming a chronic pain disorder in the near future. Moreover, the dental profession should embrace a psychosocial model of chronic orofacial pain and TMD management following the medical model for pain management. They needed to assess their patients preoperatively for dental anxiety and use appropriate patient management techniques based on the outcome of the assessment. Pharmacologic modalities like sedation can be used for reducing anxiety and pain related to the treatment in indicated patients [38]. Virtual reality is also an effective distraction tool to alleviate the anxiety of the patient [39].

Some patients may present with complex complications sometimes resulting in additional treatment, long-term medications, and an ongoing dependency on the health care system [40-42]. It is necessary to have a good follow up and review.

## Conclusion

Within the limits of the study, hot massage and muscle relaxants were most preferred conservative treatment modalities in the management of TMDs. TMD mostly affects the males of the age group 31-40 years. Disc-condyle disorder was the common type of TMD in our study. Thus, non-invasive treatment modalities can be advised as the first line of treatment for TMDs.

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