

# AWARENESS AMONG DENTAL STUDENTS ABOUT THE RELATIONSHIP BETWEEN MALOCCLUSION AND TMJ PROBLEMS

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**ABSTRACT:** *The aim of this study is to determine the understanding regarding the relationship between malocclusion and TMJ problems among dental students. The purpose of this study is to create awareness and determine the understanding of the relationship between malocclusion and TMJ problems among dental students. This study was conducted based on a questionnaire which consists of 10 questions through a web-linked application called Survey Monkey. A convenient sample size of 100 consecutive dental students who are currently practicing in Chennai participated in the study. As an overall result, most of the participants are aware of the relationship between malocclusion and TMJ problems. As a conclusion, awareness on the relationship between malocclusion and TMJ problems among dental students in Chennai is adequate but certain knowledge has to be brushed up among them for a higher level. Furthermore, they need to be trained on these grounds to help them treat their patients with more consent and awareness.*

**KEYWORDS:** *malocclusion; temporomandibular joint; awareness; dental; knowledge*

## 1. INTRODUCTION

The term temporomandibular disorders (TMD) can be associated with dysfunctions-affected masticatory muscles, temporomandibular joints (TMJ) and structures related to it. This disorder is mainly affected by joint and muscular pain, joint noises and limited or irregular mandibular function. It can trigger the quality of life considerably.[1] According to American Academy of Pediatric Dentistry (AAPD) this disorder initiated during childhood and adolescence. However, it has a lower intensity in adult populations with mild to moderate signs and symptoms. Moreover, the prevalence of signs and symptoms related to TMD can be further elaborated by the development stage of craniofacial growth, which has major morphological changes.[2]

One of the most controversial issues nowadays is known as the aetiology of TMD in clinical dentistry. Biopsychosocial models with a biological disorder that may have psychological

antecedents, such as anxiety and this situation exists in a social framework in adults were the most accepted theory so far in TMD topic.[3] It is well known that psychosocial problems in children and adolescents are more frequent than in the past, and also that they are an association of mental disorders and physical diseases in adolescents with mental-physical comorbidity.[4] In adolescents, there is a positive correlation between increased age and the presence of signs and symptoms of TMD, so the emotional aspects seem to be significant factors in the presence of those disorders.[5] Furthermore, the prevalence of malocclusion in children and adolescents seems to be higher nowadays. This is considered as a public health problem in the world and the third priority in oral care. [6]

TMD is known to be associated with occlusal abnormalities and causes headache, facial growth and muscles function alterations.<sup>27-31</sup> The multifactorial factors which identified the signs and symptoms of TMD in adolescents as well as the factors associated with it can improve the ability to detect the TMD in this age. In addition, it was once fundamentally used for minimising and preventing TMD pain.[7] It was also used to decrease its impact on adolescent's quality of life. Many various aspects of functional occlusion were investigated in cases of TMD such as the deviation between the centric relation (CR) position and the habitual maximum intercuspation (HMI) position. These are the contacts on the working and non-working sides, absence of lateral or protrusive guides and interference in the disocclusion guides.[8]

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. Several authors have done so many studies and proved that Class I, Class II malocclusion, posterior crossbite, anterior open bite, horizontal overlap and vertical overlap, suggested that these alterations are responsible for the onset of TMD symptoms.[9] Orthodontic treatment which was associated with TMD are known to be the major cause, cure or a preventive factor of dysfunctions for changing the patient's occlusal pattern. Class III malocclusion in adult patients was treated as compensatory for approximate surgery to a possible inter-relation with TMD.[10]

Many previous studies demonstrated that ortho-surgical management of Class III skeletal malocclusion can present and effects the TMD on mandibular function. This improvement in TMJ condition may be related to the type of osteotomy performed or to the type of fixation used. The literature does not, however, refers to the TMD index in a population treated for Class III malocclusion.[11] Therefore, this study was conducted with the aim of determining the level of awareness among dental students about the relationship between malocclusion and TMD.

## **2. MATERIAL AND METHODS**

A convenience sample size of 100 consecutive dental students who are currently pursuing in Saveetha Dental College, Chennai participated in the study. A cross-sectional observational online based study was conducted. Questionnaire was constructed on the Survey Monkey website with dichotomous responses and multiple choice questions. The questionnaire consists of 10 questions as shown in Table 1. A link containing these questionnaires was shared with all the participants and required them to answer the questions. All the responses were analysed and recorded.

## QUESTIONS

**Q1. Do you think there is a relationship between malocclusion and TMJ problems?**

**Q2. Orthodontic treatment is the best way to manage TMJ problems in patients with skeletal malocclusion?**

**Q3. Does open bite cause TMJ problems?**

**Q4. Will you suggest TMJ splinting therapy for TMD patients?**

**Q5. Orthodontic treatment is the one of the management of TMD?**

**Q6. Both malocclusion and TMD have effects on masticatory functions?**

**Q7. Absence of canine guidance does not lead to TMD?**

**Q8. Malocclusion that disrupts the stomatognathic structure should be considered as risk factors for developing TMD?**

**Q9. Orthodontic treatment is the only management done for TMD?**

**Q10. MPDS and malocclusion are the only causes of TMD?**

### 3. RESULTS

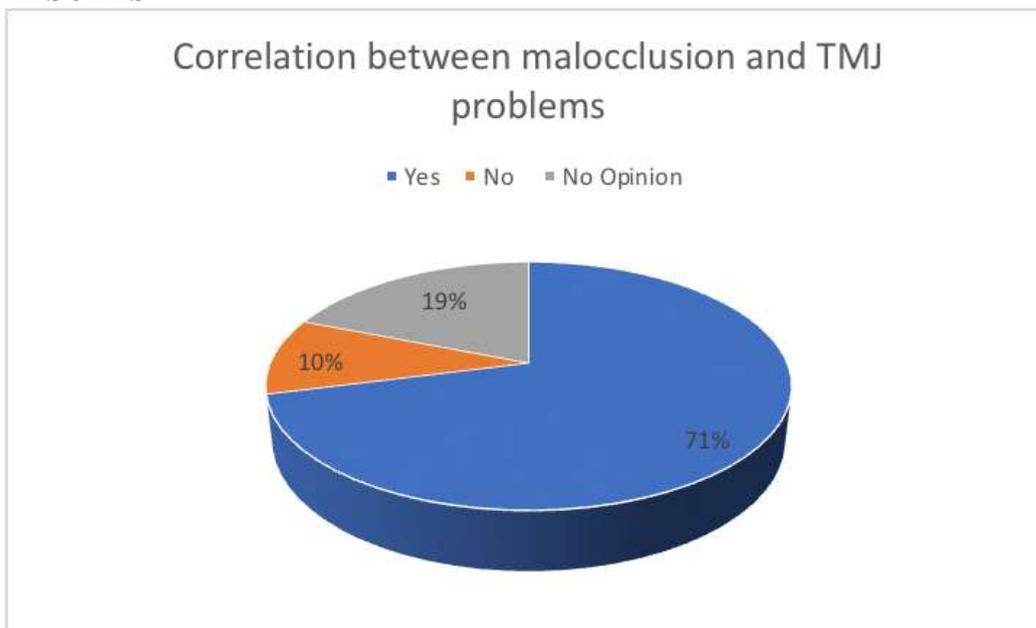


Figure 1 shows the percentage of participants answering the question regarding correlation between malocclusion and TMJ problems

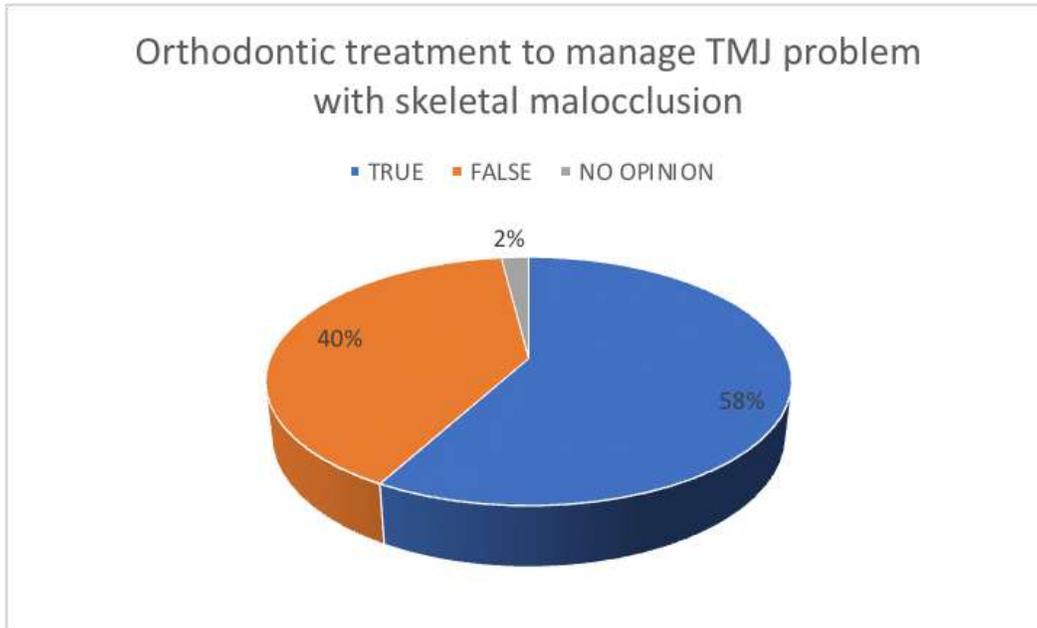


Figure 2 shows the percentage of participants answering the question regarding orthodontic treatment as solution for TMJ problems with skeletal malocclusion

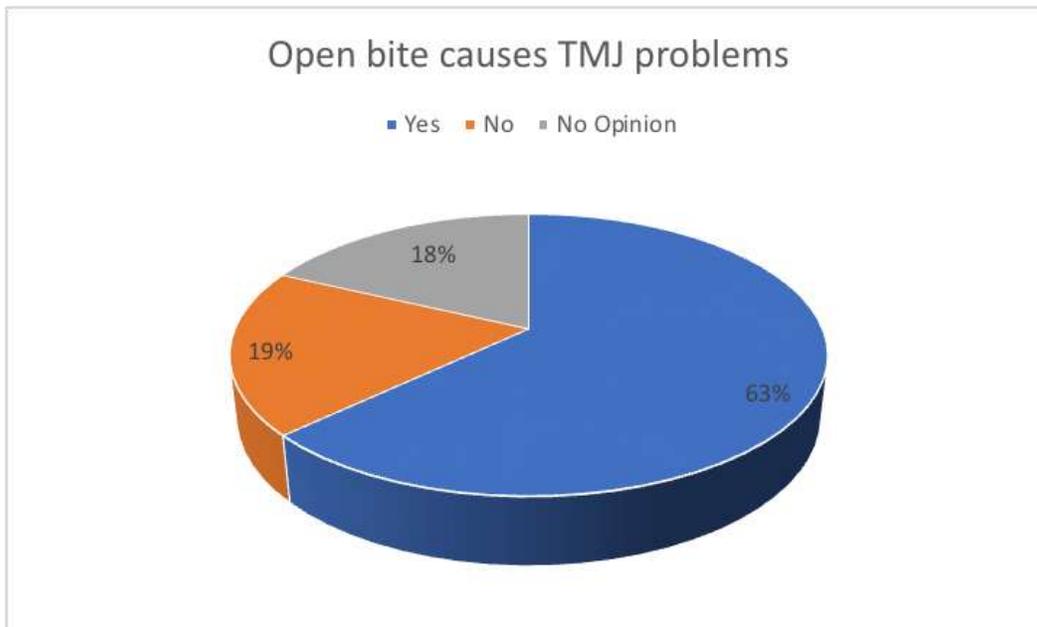


Figure 3 shows the percentage of participants answering the question regarding open bites causing TMJ problems

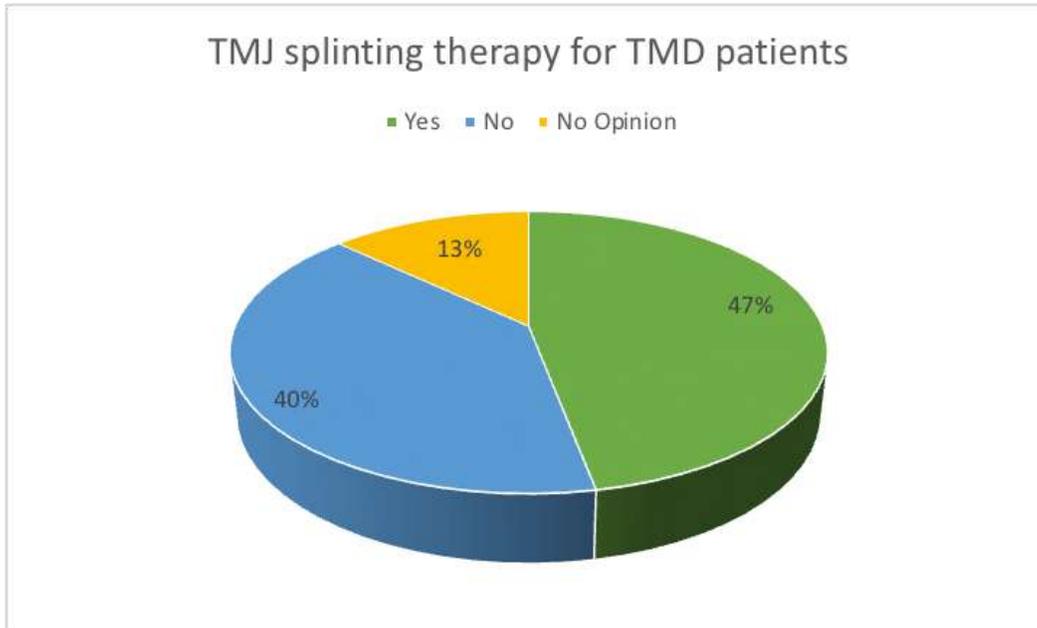


Figure 4 shows the percentage of participants answering the question regarding TMJ splinting therapy as a treatment for TMD

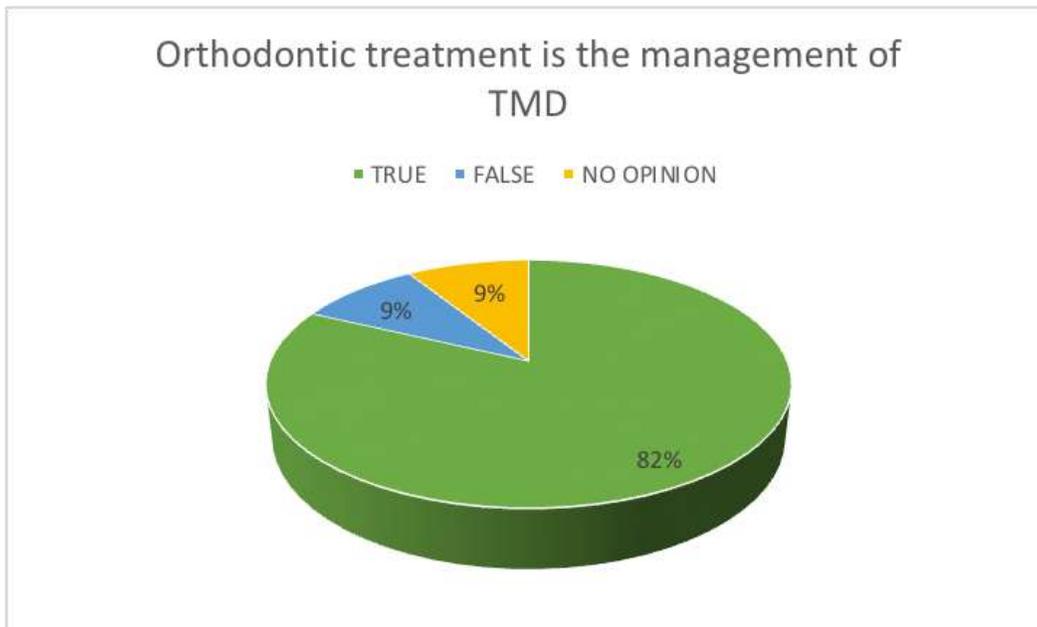


Figure 5 shows the percentage of participants answering the question regarding treatment for TMD

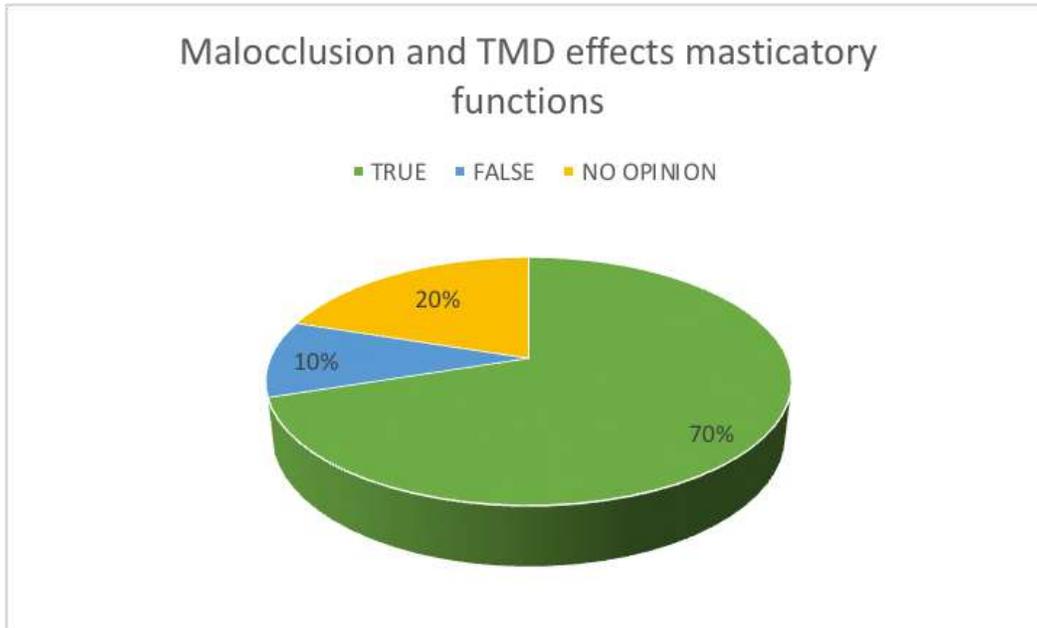


Figure 6 shows the percentage of participants answering the question regarding effects of malocclusion and TMD towards masticatory functions

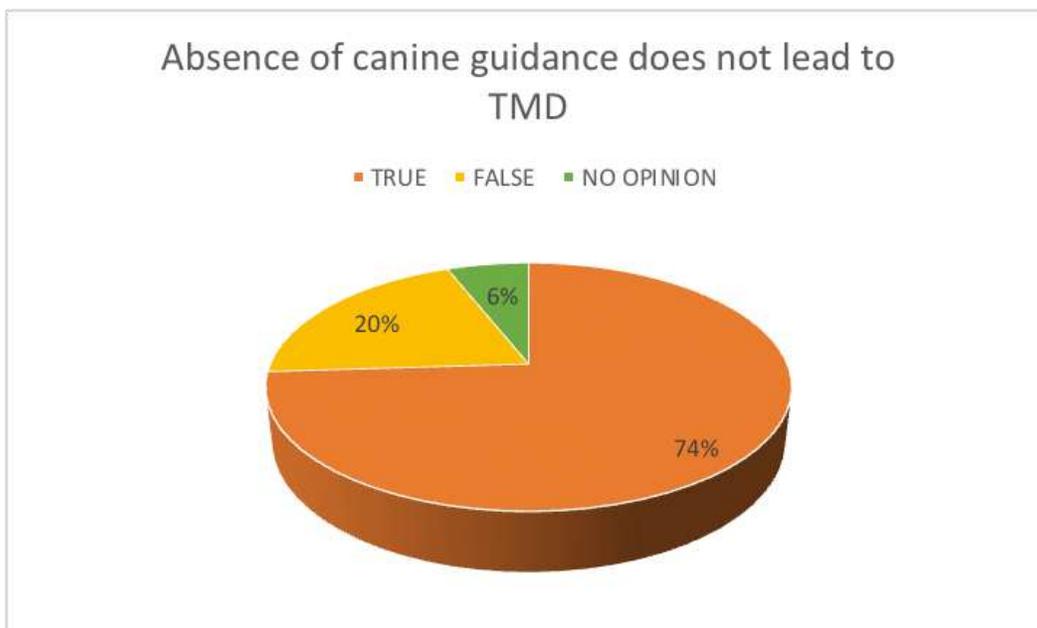


Figure 7 shows the percentage of participants answering the question regarding absences of canine guidance towards TMD

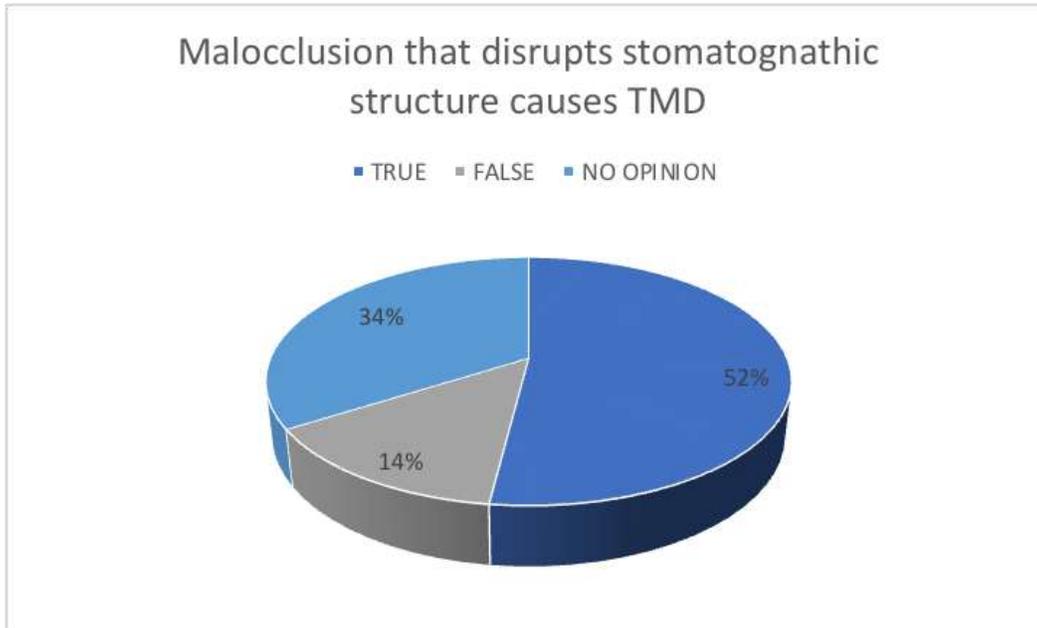


Figure 8 shows the percentage of participants answering the question regarding malocclusion that disrupts stomatognathic structures

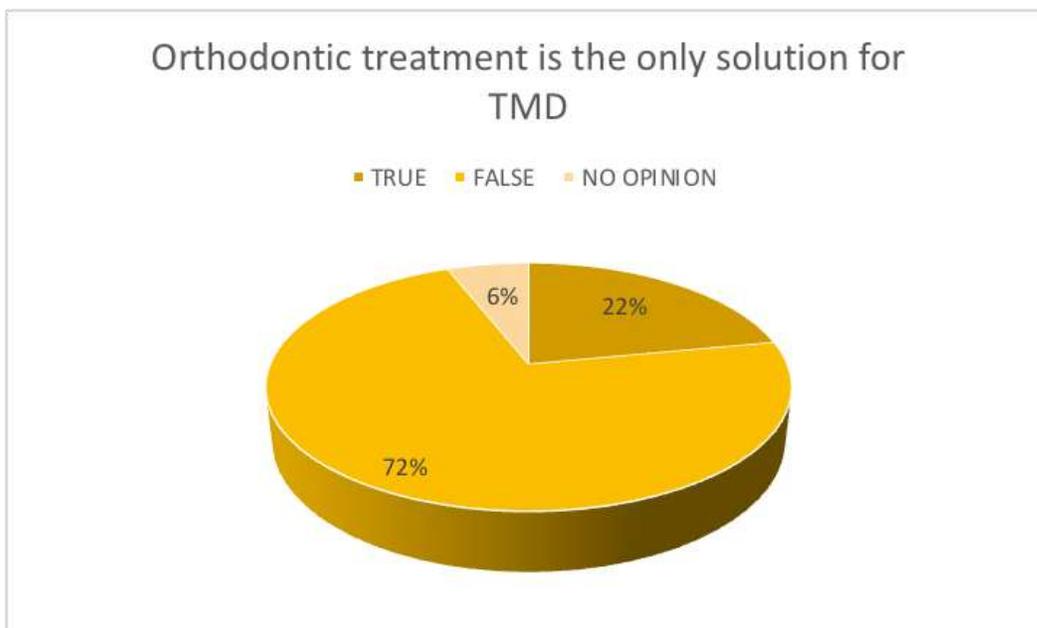


Figure 9 shows the percentage of participants answering the question regarding the only solution for TMD is orthodontic treatment

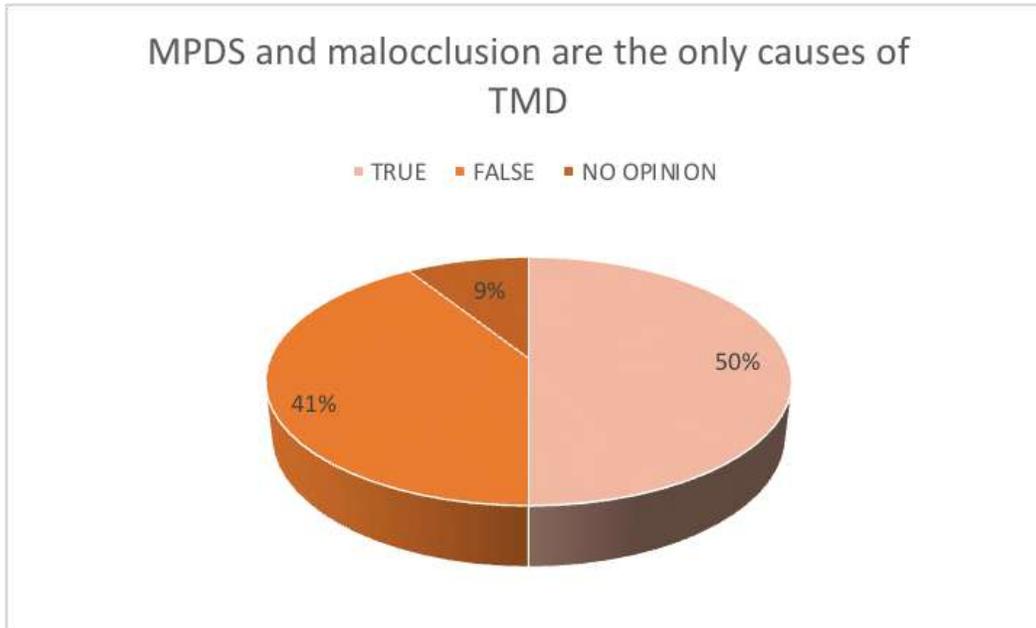


Figure 10 shows the percentage of participants answering the question regarding MPDS and malocclusion are the only caused of TMD

According to Figure 1, 71% of the dental students who participated in this study believe that there is a correlation between malocclusion and TMJ problems. 10% of the participants gave an answer of no correlations found between malocclusion and TMJ problems. Remaining 19% of the participants had no opinions regarding this question. Figure 2 explained that about 58% of participants agreed with the statement stating orthodontic treatment is the best way to manage TMJ problems in patients with skeletal malocclusion. 40% of the participants did not agree with the statement, whereas 2% of them had no opinion regarding this statement.

Figure 3 showed that about 63% of the participants had an opinion regarding open bites may cause TMD. Remaining 19% and 18% of them choose the option no and no opinion, respectively. 47% of the participants suggested that TMJ splinting therapy for TMD patients. However 40% of the participants disagree with the suggestion. Remaining 13% of them had no opinion regarding this statement, as shown in Figure 4. According to Figure 5, 82% of participants agreed that orthodontic treatment is one of the treatments for TMD. 9% of them disagreed with this statement and had no opinion regarding this, respectively.

70% of the participants believed that both malocclusion and TMD have an effect on masticatory functions. However, 10% of them did not agree with this conclusion. Remaining 20% of them had no opinion regarding this topic, as shown in Figure 6. Figure 7 explains that 74% of them accepted the statement stating absence of canine guidance does not lead to TMD, whereas 20% of them disagreed and the remaining 8% of them had no opinion. Figure 8 showed questions answered by the participants regarding disruption caused by malocclusion towards stomatognathic structures should be considered as a risk factor for developing TMD. 52%, 14%, 34% of the participants answered 'true', 'false', and 'no opinion', respectively.

Orthodontic treatment is the only management done for TMD, was the statement given in Figure 9. 22% of participants agreed with this and 72% of them disagreed. Remaining 6% of them had no opinion regarding this. Finally, Figure 10 explained 50% of them agreed that MPDS and malocclusion are the only cause of TMD. However, 41% of them disagreed with this statement and 9% of them had no opinion regarding this statement.

#### 4. DISCUSSION

TMD are one of the most common reasons for pain and discomfort in the oral and the maxillofacial region including the ears and forehead. These disorders being a multifactorial condition may be caused due to many factors such as genetics, stress, and malocclusion. The discussion about this relationship between the TMJ and malocclusion began as early as 1934 when Costen said that patients with symptoms of dysfunction of TMJ such as dull pain within and about the ears and constant and severe headache localized to occiput or behind the ears showed marked improvement which following the correction of the overbite, renewal of molar occlusion to relieve the constant pressure off the surface of the condyle, and resulting establishment of proper articulation of the condyle within the articular fossa.

There were many studies regarding the prevalence of malocclusion in various populations. Prabhakar et al.[12]stated that there was an increased prevalence of angle's Class 1 malocclusion in school going children in Chennai. The prevalence of malocclusion in the population of Himachal Pradesh school children was studied by Singh et al.[13] It stated that around 37.55% of the total sample was in great need for orthodontic treatment. A retrospective study by Sandeep and Sonia[14] also stated the increased prevalence of Angle's Class 1 malocclusion by selecting the samples from a dental hospital in Rwanda.

Müller et al .[15]compared different methods such as mri, orthodontic examination and ultrasound examination for the examination of tmj in children with juvenile idiopathic arthritis. They stated that though none of the above-mentioned methods were very efficient, orthodontic examination was better in diagnosing the problems related to tmj than ultrasound. Kuseler et al[16] and Koos et al[17] also stated the importance of clinical findings and symptoms in diagnosing children with juvenile idiopathic arthritis. Paesani et al.[18]stated that with a diagnostic accuracy of 43% clinical examination cannot be used as a tool for determining the status of internal derangement of TMJ.

Thilander et al[19] showed the prevalence of TMD and its association with malocclusion and stated that TMD was associated with the posterior crossbite, anterior open bite, Angle Class III malocclusion, and extreme maxillary overjet. Runge et al.[20]in early 1989, showed the relationship between the TMJ sounds and malocclusion. It stated that there was increased inter-incisal angle in the sound-present group, and wear of the dental surfaces and increased overbite in the subgroup of reciprocal-clicking may be the associated factors. A review of the relationship between malocclusion and TMJ diseases was studied by Chokalingam and Das.[21] The relationship between malocclusion and the need for orthodontic treatment in patients with temporomandibular dysfunction was studied by Kaselo et al.[22] It also stated that in patients with malocclusion, pain from TMJ has a significant negative impact on activities of daily living.

Mohlin et al.[23]compared the symptoms of subjects with mild-to- moderate TM joint dysfunction with that of subjects with no signs and symptoms of temporomandibular dysfunction stated that orthodontic treatment seems to be neither a major preventive nor a significant cause of TMD. Ohrbach et al.[24]andVanderas[25] also gave insight regarding the relationship between malocclusion and craniomandibular or TMD. The latter was a review article in early 1993 which stated that early orthodontic treatment to prevent the development of temporomandibular dysfunctions was not justified scientifically in that period. Reynders[26] published an early article containing the review of literature 1966–88 regarding orthodontics and TMD stated that there were conflicting opinions between the same and also that orthodontic treatment is not specific or necessary to cure the signs and symptoms of temporomandibular dysfunction.

## 5. CONCLUSION

Majority of the dental students within the study were aware of the discussed topic above. However, this study was limited to only a few dental institutes around Chennai and only 100 students participated. Further, study should be conducted in a larger scale area and sample size to get a proper overview regarding this topic within the dental students concerning the new advent technologies.

## ACKNOWLEDGEMENT

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## CONFLICT OF INTEREST

The authors declare that there were no conflict of interest

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