

## Prevalence Of Malocclusion in Children between 6 to 18 Years Visiting a University Hospital

Research Article

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### Abstract

Malocclusion is a common dental problem that influences the affected individuals to varying degrees. Malocclusion influences the affected individuals to varying degrees. It can affect the child's self confidence and well being. This study is important to plan intervention programs and highlight the importance of early orthodontic screening. The aim of the study was to determine the prevalence of malocclusion in patients aged 6 to 18 years visiting a university hospital. Retrospective data of patients who visited the Department of Pedodontics and Preventive Dentistry was analysed from June 2019 to March 2020. 200 patients who fulfilled the inclusion and exclusion criteria were randomly selected. The data was analyzed using SPSS with Chi square test. Boys (51.50%) were found to have higher prevalence of malocclusion compared to girls. The most common molar relation seen was Class 1 (73.5%). Crowding (30%) was the most common tooth variation seen and a significant association was present between molar relation and gender. Within the limits of our study, the prevalence of malocclusion in 6 to 18 years olds was found to be 87.50%.

**Keywords:** Esthetics; Malocclusion; Mixed Dentition; Orthodontic Treatment; Self Confidence; Permanent Dentition.

### Introduction

Malocclusion, defined as a handicapping dento-facial anomaly by the World Health Organization. It is abnormal occlusion with disturbed craniofacial relationships, which may affect esthetic appearance, function, facial harmony, and psychosocial well-being [1, 2]. There are various factors which lead to malocclusion, such as hereditary and environmental aspects as well as the shape and size of the jaw. Dental caries, pulpal and periodical lesions, dental trauma, developmental abnormalities, and oral habits are common dental conditions in children that are strongly related to malocclusion [3].

Malocclusion influences the affected individuals to varying degrees. Early diagnosis, prevention and management of oral health in the early childhood stage should be carried out in pediatric dentistry to minimize the unwanted effect of malocclusion on dentition. It is one of the most common dental problems, with

high prevalence ranging from 20% to 100% reported by different researchers [3-6].

Deep overbite, midline deviation, excessive over jet, anterior cross bite, malalignment, space, and open bite are frequently seen types of malocclusion in clinics. Pediatric dentistry focuses on preventing and treating various oral diseases for child and adolescent, and management of oral health from the early childhood stage in the purpose of establishing normal dentition from eruption of the first deciduous tooth to achieving final good occlusion.

Predominance of malocclusion in the deciduous, mixed and permanent dentitions varies across studies as a result of populace contrasts and techniques for estimation [7]. In pediatric dentistry the most important concerns is the loss of necrotic primary molars leading to space loss. Our department is passionate about child care, we have published numerous high quality articles in this domain over the past 3 years [8-17, 18-22] With this inspi-

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ration we planned to pursue research on Prevalence of Malocclusion in pediatric dental patients. Although scarce, studies that have directly related malocclusion and its severity to social status indicate that children with relatively poor lifestyles have higher orthodontic treatment needs compared to their counterparts with wealthier lifestyles [23, 24]. Social conditions also can affect malocclusion indirectly.

However, less contrasts were found in characterization of malocclusion in view of progressively normalized standards of the connection among maxillary and mandibular molars or the overjet among upper and lower incisors [25-27].

The aim of the study was to determine the prevalence of malocclusion in children between the age 6 to 18 years visiting a university hospital in Chennai.

## Materials and Methods

### Study design and setting

The study was conducted after ethical approval was obtained from the institutional review board. (SDC/SIHEC/2020/DI-ASDATA/0619-0320.) A retrospective study was conducted on pediatric patients with dental malocclusion who visited Saveetha Dental College. The study population included all patients with dental malocclusion. The advantage of this study was the flexible data that could be obtained easily and economically. However the drawback of this study is that there were geographic limitations and the people involved in the study were from an isolated population and belonged to the same ethnic group. The internal validity of the study was carried out by analyzing the age and gender of patients who reported with dental malocclusion. The external validity was determined by dental malocclusion.

### Data collection

Data was retrospectively collected from the case records of patients who visited the Department of Pediatric and Preventive Dentistry from June 2019 to March 2020. Patients aged 6 to 18 years who visited the department during the time frame and those

who have never undergone orthodontic treatment were included. Those outside the age frame, visited outside the time period, undergoing or completed orthodontic treatment and children with systemic diseases were excluded. 200 patients who fulfilled the inclusion and exclusion criteria were randomly selected for the study. Collected data was cross verified using photos and case sheets. Data collected was then tabulated. The case sheets were reviewed by checking intra oral photos and data of the patients. Any patient with incomplete data was excluded from the study. The data was entered in an excel sheet in a methodical manner and was imported to SPSS.

### Statistical Analysis

After tabulation using MS Excel, the data was exported to IBM SPSS software [Version 19: IBM Corporation NY USA] for statistical analysis. Descriptive statistics was done to assess the dental malocclusion in pediatric patients. Pearson chi square test was done to statistically analyze the data. Pearson chi square test was used to identify any significant level of variation of association. The significance level was set at 0.05.

## Results And Discussion

Out of the total 200 patients with dental malocclusion involved in the study, the maximum number of participants in the study was from the age group 6-10 years (38.50%) followed by 15-18 years. The least number of participants were in the age group 11-14 (26.50%) [Figure 1]. There were more boys (51.50%) compared to girls (48.50) [Figure 2]. Most commonly seen molar relation was class I (73.50%) followed by Class II (16.00% and the least seen molar relation was Class III (10.50%) [Figure 3]. Most commonly seen tooth variation was crowding (60%) followed by spacing (17.50%). Least commonly seen variation was cross bite (2%) (Figure 4).

The most commonly seen in molar relation in 6-10 years was Class I (28%). In the age group 11-14 years, most commonly seen malocclusion was Class I (19%). In 15-18 years, the most common malocclusion was Class I (26.50%). P value was 0.126 showing that there was no significant association between age and molar

**Figure 1.** Represents the frequency distribution of patients based on age. X axis represents the age of the patients and Y axis represents the number of patients. Majority of the participants in the study was from the age group 6-10 years (38.50%; purple ) followed by 15- 18 years (Red). The least number of participants were in the age group 11-14 (26.50%; Blue).

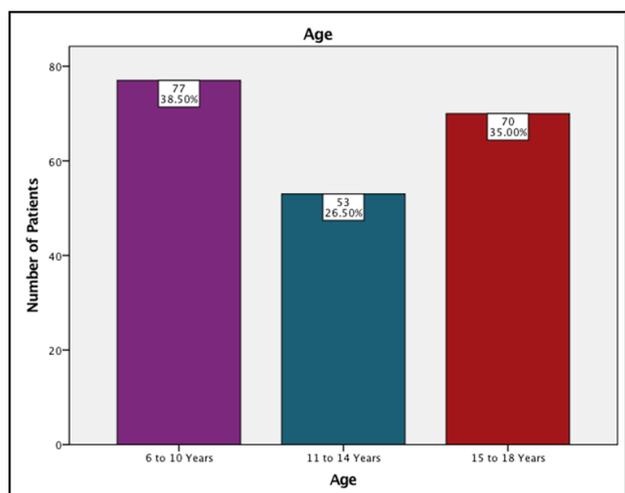


Figure 2. Represents the frequency distribution of patients based on gender. X axis represents gender of the patients and Y axis represents the number of patients. Based on this frequency distribution there were more boys (51.50%; Blue) compared to girls (48.50%; Purple ).

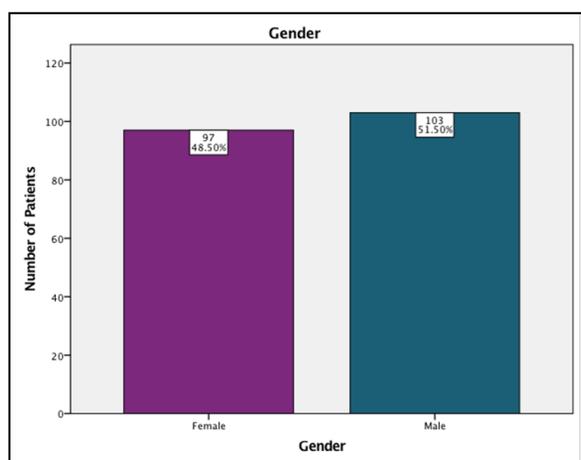


Figure 3. Represents the frequency distribution of dental malocclusion based on molar relation. X axis represents molar relation and Y axis represents number of patients. Most commonly seen molar relation was class I (73.50%;Purple ) followed by Class II (16.00%;Blue). The least seen molar relation was Class III (10.50%; Red).

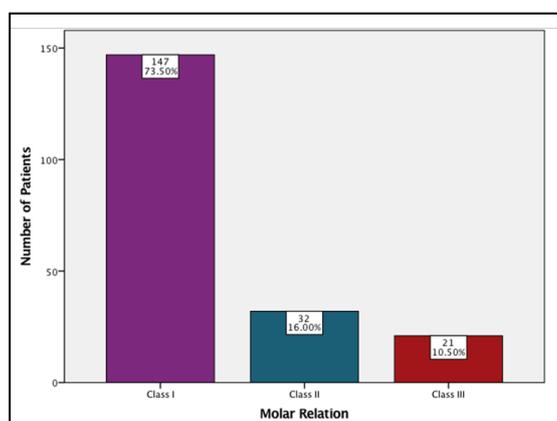
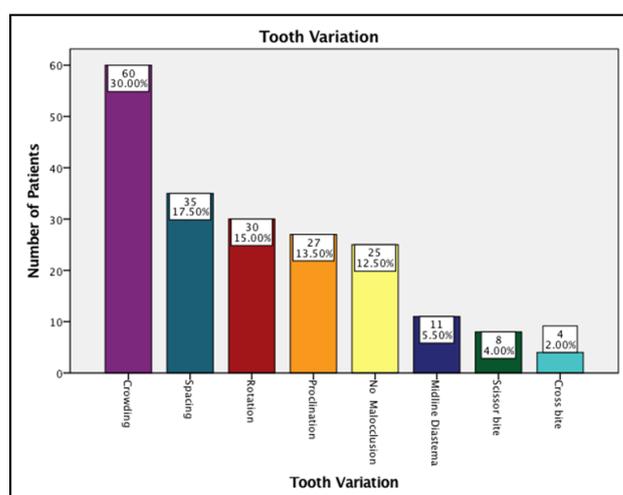


Figure 4. is a frequency distribution of tooth variations seen in patients. X axis represents tooth variations and Y axis represents number of patients. Most commonly seen tooth variation was crowding (60%; Purple) followed by spacing (17.50%; Blue). Least commonly seen variation was crossbite (2%; Light Blue).



relation [Figure 5]. The most commonly seen tooth variation age group 6-10 years was crowding (11.50%). In the age group of 11- 14 years, most commonly seen tooth variation was crowding (7.50%). In the age group of 15-18 years most commonly seen tooth variation was crowding (22%). P value was 0.943 showing there was no significant association between age and tooth vari-

ations [Figure 6]. Among girls, the most common molar relation seen was Class I (41.50%) and least commonly seen was Class III ( 2.50%). Among boys, the most commonly seen was Class I (32.00%) and the least commonly seen was Class III (8%). P value was 0.001 showing a significant association between gender and molar relation [Figure 7]. Most commonly seen tooth varia-

Figure 5. Represents the association of age with molar relation. X axis represents Age and Y axis represents the number of patients. Across all the age groups the most commonly seen molar relation was Class I (blue) followed by Class II (green) and Class III (cream) malocclusion. P value was 0.126 showing that there was no significant association between age and molar relation (Pearson Chi-Square 20.122. p value: 0.126).

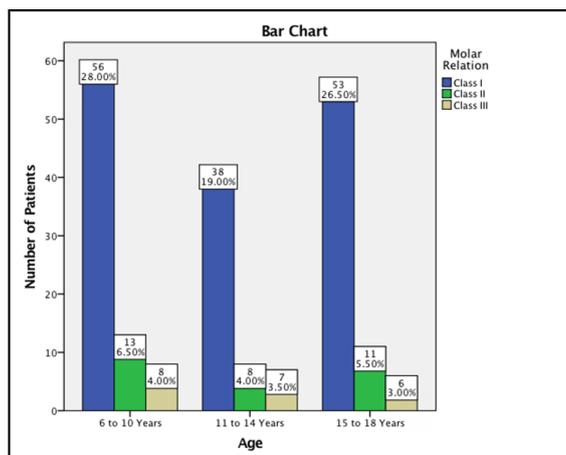


Figure 6. Represents the association between the age groups and tooth variations. X axis represents age and Y axis represents number of patients. The most commonly seen tooth variation across all the age groups was crowding (green). P value was 0.943 showing there was no significant association between age and tooth variations. (Pearson Chi-Square: 14.175, p value :0.943, p > 0.05).

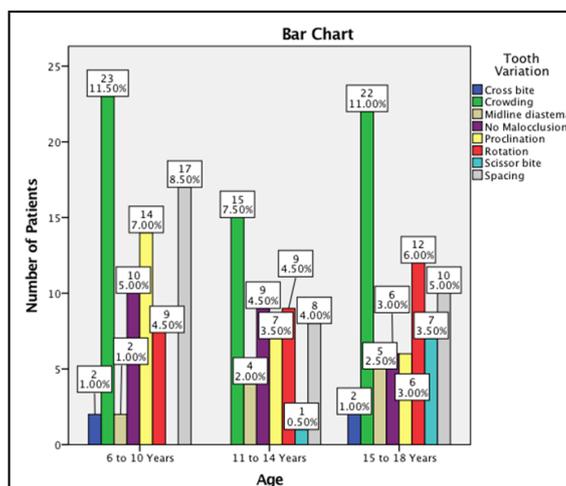
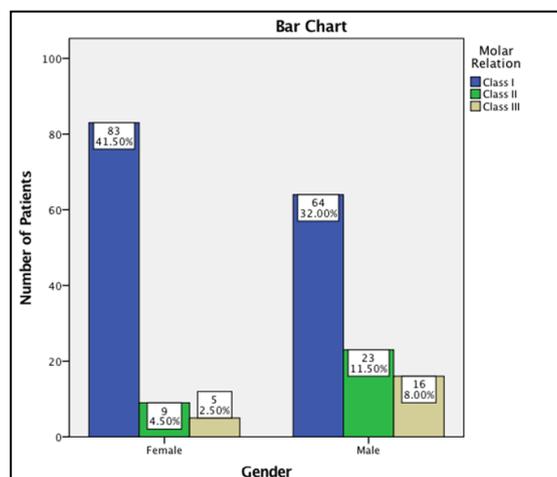
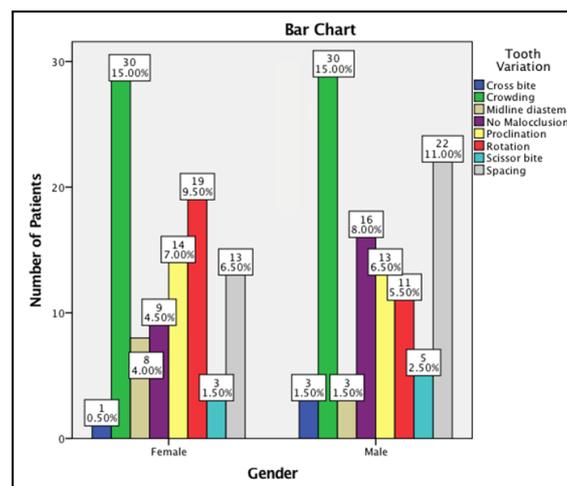


Figure 7. Shows the association between molar relation and gender. X axis represents gender and Y axis represents number of patients. Among girls, the most common molar relation seen was Class I (41.50%;Blue) and least commonly seen was Class III (2.50%;Beige). Among boys the most commonly seen was Class I (32.00%;Blue) and the least commonly seen was Class III (8%;Beige). P value was 0.001 showing a significant association between gender and molar relation (Pearson Chi-Square: 14.175, p value 0.001, p < 0.05).



**Figure 8.** Shows the association between gender and tooth variation. X axis represents gender and the Y axis represents the number of patients. Most commonly seen tooth variation was crowding in both genders. The least commonly seen variation among girls was crossbite (0.50%; Dark Blue). Among boys, the least common was crossbite (3%;Dark Blue) and midline diastema (3%;Beige). p value was 0.186 showing there was no significant association between tooth variation and gender. (Pearson Chi-Square=10.046. p value: 0.186,  $p > 0.05$ ).



tion was crowding in both genders (15.00%) each, the least commonly seen variation in females was cross bite (0.50%). In males, it was cross bite (3%) and midline diastema (3%) p value was 0.186 showing there was no significant association between tooth variation and gender [Figure 8].

Oral health management aims to establish a healthy dentition and alleviate or avoid malocclusion from the eruption of the first primary tooth to the accomplishment of young permanent dentition, is of great significance in the pediatric population [1].

Infants and young children frequently engage in unconscious oral habits due to some prepotential reflexes, lack of feeding, and fear or unpleasantness. A significant association of oral habits with malocclusion has been reported in various studies [2-5] and the effect of oral habits on cranial maxillofacial growth and development is dependent on the nature, onset and duration of habits. However certain conditions in which malocclusion occurs are temporary and get corrected by itself as the child gets older.

In the present study, the occurrence of malocclusion was maximum in the age group of 6 to 10 years. The results are similar to previous studies [28] which state that children start to have an idea of esthetics and peer pressure sets in which cause them to think about their appearance significantly. Malocclusion was more common among boys compared to girls. This could be due to the fact that the boys were more interested in getting treatment for malocclusion [29].

In the present study, the most common individual tooth variation was crowding followed by spacing. This could be due to the fact there could be jaw - tooth size discrepancy and tooth size is larger compared to space available [30]. Lower frequency of crowding in females than males narrated in studies by Danaei et al. and Rwakata et al. was sustained in the present study [31, 32].

In permanent dentition, spacing was the most common followed by crowding. This could be due to the long term effects of oral habits or supernumerary teeth. Jaw size and tooth discrepancy and heredity can also be potential cause [33].

In our study, females presented with a high number of class II and class III malocclusion which is in correspondence to the results of Onyeano et al. who reported that females were found to have significantly more of classes II and III molar relationships than males [34]. Like most communities [35-40] the population studied in this research had more crowding than spacing.

Our study had its own limitations. The sample size was small and was a single centre study. However the long term follow up of these patients will allow us to understand how patients felt after their malocclusion was treated.

## Conclusion

Within the limits of our study, the prevalence of malocclusion in 6 to 18 years olds was found to be 87.50%. Boys (51.50%) were found to have higher prevalence of malocclusion compared to girls. The most common molar relation seen was Class I (73.5%). Crowding (30%) was the most common tooth variation seen. Though class I molar relation was observed among the majority of study population, Class II and Class II molar occlusion was frequently observed among boys.

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Special Issue on

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