

# Assessment of Need for Orthodontic Treatment in Adolescents

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## Abstract

Malocclusion has been reported to the diverse gender and age groups. Prevalence of malocclusion is high among children and adolescents. Determining the factors involved in the development of the occlusion during transitional period from primary to permanent requires knowledge and experience. Hence, early treatment of malocclusion is necessary. The aim of the study was to assess the prevalence of adolescents who are in need of orthodontic treatment. The study has been carried during the period June 2019 to April 2020 on a total of 637 patients who reported to a private dental hospital in Chennai. All case sheets of relevant data with orthodontic findings were reviewed for the study and adolescents in the age group of 14-19 years were segregated. The data was entered in SPSS and analyzed through the Chi square test. The study evaluated 20 common orthodontic findings among adolescents. From the results obtained, the number of patients who reported with orthodontic findings in the current study was majority among males than females. 35% patients with orthodontic findings were in the age group between 14-16 years and 64.5% in the age group between 17-19 years. Amongst the 20 common orthodontic findings, the most prevalent orthodontic finding was crowding. Within the limits of the study it can be concluded that crowding was the most common orthodontic finding in our study population and number of patients who reported for orthodontic treatment were majorly in males compared to females and 17-19 years of age but the study was not statistically significant.

**Keywords:** Adolescents; Orthodontic findings; Malocclusion; Prevalence

## Introduction

Orthodontics is a specialized branch of dentistry which is concerned with the development of deviations from the original position of teeth, jaws and face.

It interferes with the function and appearance of the oral cavity and the face. <sup>[1]</sup>

The fundamentals of orthodontics are that teeth move through the alveolar bone when adequate forces are delivered. There are various local and systemic factors like age, nutrition, consumption of drugs, etc., seem to affect orthodontic tooth movement. <sup>[2]</sup>

The most common condition in orthodontics are anterior open bite, excessive over jet, class-2 malocclusion, posterior cross bite. <sup>[3]</sup>

The prevalence of sucking habits of age below 5 is implicated in the development of anterior open bite,

class-2 malocclusion, and posterior cross bite. <sup>[4,5]</sup> Age, gender, socio-economic background, self-esteem and peer-group norms have been suggested as factor which affects the self-perception of dental appearance, malocclusion and the uptake of orthodontic treatment. <sup>[6,7]</sup>

The main aim of the orthodontic treatment is to produce a healthy functional bite, creating greater resistance to disease and improving facial appearance. <sup>[8]</sup>

Some factors lead to rejection of orthodontic treatments such as experience of pain, esthetic, problems in maintaining oral hygiene and longer duration of procedures.

Malocclusion can be considered as a public health problem because of its high prevalence and prevention/treatment possibilities. A number of studies have been demonstrated its

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impact on quality of life and it has been considered the third highest oral health priority by the World Health Organization. [9,10]

Adolescence is a period of life where physical appearance takes on significant importance in the construction of personal identity. [11] A variety of social, cultural, psychological and personal factors influences the self-perception of dental appearance and the decision to undergo orthodontic treatment. Adolescents who seek orthodontic treatment are concerned with improving their appearance and social acceptance. Adolescent's previous orthodontic experience could be a factor in influencing the perception of treatment need. [12] There are several studies that have investigated the relationship between the objective of orthodontic treatment need and subjective patient and parent's perception of malocclusion. [13,14] There are no evidences related to difference in perception between current orthodontically treated, previously treated and untreated children and young individuals. [15]

Physical appearance plays a key role in self-esteem in all stages of life. In pediatric age, body self-image could be altered and undermined by physical illness and by malocclusion, with great impact on all aspects of life, such as socialization, emotional and functional aspects of life, and familiar inter-relationships and also between the ages of 8 and 10 years. [16] Alternatively, the relationship between physical appearance and perception of an esthetic deviation and the impact of such a deviation on self-esteem and body image can be considered as an important issue for determining the benefits and outcomes of orthodontic treatment that are also largely determined by biological and psychological factors. [17] Most of the times malocclusion are being ignored and neglected and the patients report very late in their life for orthodontic treatment. Previously our team has a rich experience in working on various research projects across multiple disciplines. [18-32] The study was aimed to assess of prevalence and gender distribution of orthodontic treatment need among adolescents.

## Materials and Methods

### Study designs and study setting

The present study was conducted in a university setting (Saveetha Dental College and Hospitals, Chennai, India). Thus the data available is of patients from the same geographic location and have similar ethnicity. The retrospective study was carried out with the help of digital case records of 637 patients who reported to the hospital. Ethical clearance to conduct this study was obtained from the Scientific Review Board of the hospital.

### Sampling

Data of 637 patients were reviewed and then extracted. Only relevant data was included to minimize sampling bias. Simple random sampling method was carried out. Cross verification of data for error was done by presence of additional reviewer and by photographic evaluation.

### Data collection

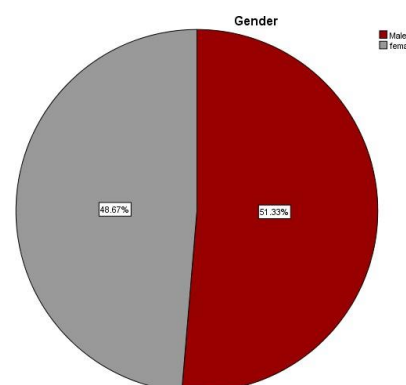
A single calibrated examiner evaluated the digital case records of patients who reported to Saveetha Dental College from June 2019 to March 2020. For the present study, inclusion criteria were data of patients with orthodontic findings in patients under the age group of 14-19 years dental status and photographs of these patients' records were reviewed.

### Statistical analysis

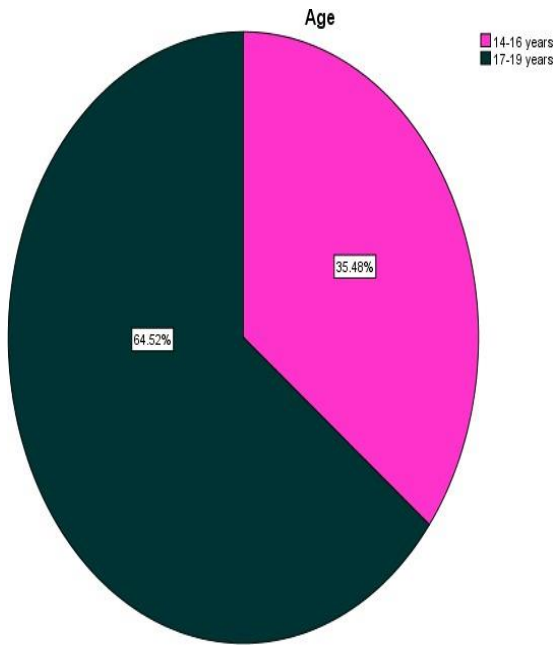
The collected data was tabulated and analyzed with Statistical Package for Social Sciences for Windows, version 20.0 (SPSS Inc., Vancouver style) and results were obtained. Categorical variables were expressed in frequency and percentage. Chi square test was used to test association between categorical variables. Dependent variables were age and orthodontic findings. The statistical analysis was done by Pearson chi square test. P value<0.05 was considered statistically significant.

## Results

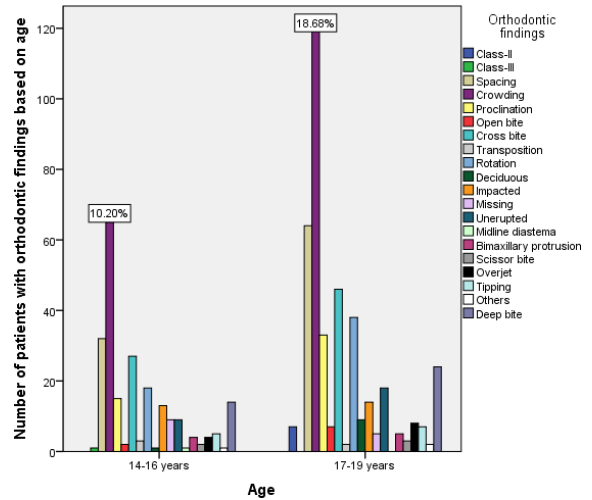
Descriptive study on distribution of study population is shown in Figure 1. Number of males (51.33%) with orthodontic findings was higher compared to females (48.67%). Distribution of the number of patients who participated in the study based on age is shown in Figure 2. 35.48% patients were in the age group between 14-16 years and 64.52% patients were in the age group between 17-19 years. Most common 20 orthodontic findings were Class-II, Class-III, spacing, crowding, proclination, deepbite, openbite, crossbite, transposition, rotation, deciduous, impaction, missing, unerupted, midline diastema, bimaxillary protrusion, scissor bite, overjet, tipping and others. Association of gender and orthodontic findings is shown in Figure 3. Among these orthodontic diagnoses the most commonly observed finding was crowding seen in males (15.86%) compared to females (13.03%). (Chi-square value=17.098; p value=1.905). Association of age-group and orthodontic findings is shown in Figure 4. Among these orthodontic diagnoses the most commonly observed finding was crowding seen in majorly in 17-19 years. (Chi-square value=20.866; p value=0.73).



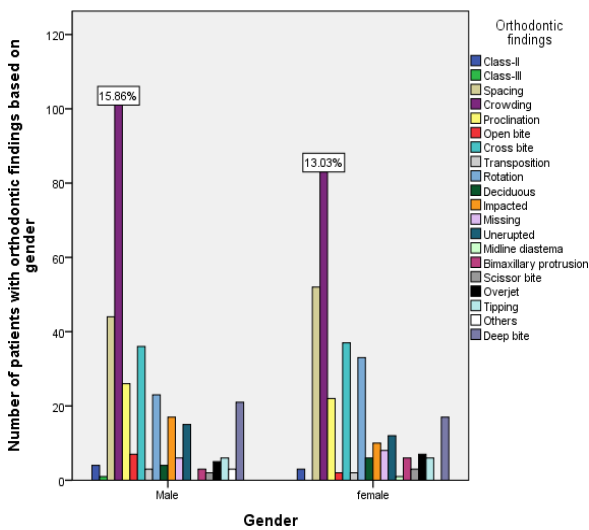
**Figure 1:** Pie chart representation shows distribution of gender population. Brown depicts males, grey depicts females. Majority of the patients seeking orthodontic treatment were males compared to females.



**Figure 2:** Pie chart representation shows distribution of study population based on age group. Pink depicts 14-16 years and teal depicts 17-19 years of age group. Majority of the patients seeking orthodontic treatment were in the age group of 17-19 years among the ages considered.



**Figure 4:** Bar chart shows association of representation shows number of adolescents who had different orthodontic findings based on age group. The x-axis shows age group and y-axis is the number of patients based on orthodontic diagnosis. From the graph we can infer that crowding (purple) has the most common finding and majorly present in 17-19 years of age. Using Pearson’s chi -square test, the association of age and number of patients with different orthodontic findings is not statistically significant. (Chi-square value=20.866; p value=0.73).



**Figure 3:** Bar chart shows association of number of patients with different orthodontic findings based on gender.

The x-axis shows gender and y-axis is the number of patients based on gender. From the graph we can infer that crowding (purple) is the most common diagnosis present majorly among males compared to females.

Using Pearson’s chi-square test, the association of gender and number of patients with different orthodontic findings is not statistically significant. (Chi-square value=17.098; p value=1.905).

## Discussion

Majority of studies on the need for orthodontic treatment have been conducted on children and in adolescents. [33] From the current study 20 commonest orthodontic findings were included were class-II, class-III, spacing, crowding, proclination, deep bite, open bite, crossbite, transposition, rotation, deciduous, impaction, missing, unerupted, midline diastema, bimaxillary protrusion, scissor bite, overjet, tipping and others. The most frequent orthodontic findings diagnosed amongst the twenty, were crowding. Adolescents who reported for treatment were majorly in 17-19 years of age.

In a study done by Leondrao, the sample size consisted of 403 subjects aged 14 to 18 years, selected randomly from a population of school children in the same age group. In the current study number of patients evaluated for the study was 637 aged 14-19 years. Malocclusion is a most encountered problem among adolescents and orthodontic treatment needs increase with age. [34,35] Therefore early treatment is essential for correction of malocclusion or any orthodontic condition for aesthetic appearance and occlusion. Number of patients was 35.5 % under 14 to 16 years and 64.5% under 17-19 years.

In other studies done by Maisie et al. adolescence of age group between 15 to 19 years was included in this study. [36] The current study did not emphasize on the prevalence of different types of malocclusion due to less population size and uncentered study. Therefore study can be carried among diverse populations to find the severity of malocclusion. In the current study crowding (28.9%) followed by spacing (15.1%) were the most diagnosed orthodontic finding in all age groups.

Ravi Kumar et al. study showed crowding was present in 47.2% patients and spacing in 27.2% patients.<sup>[37]</sup>

Males had a significantly higher prevalence of anterior crowding, midline diastema and largest anterior maxillary irregularity than females Crossbite (11.5%) was the third most prevalent amongst the other orthodontic findings. In a study by Gelgor et al. crossbite were observed in 9.5% patients.<sup>[37]</sup> The institution is passionate about high quality evidence based research and has excelled in various fields.<sup>[38-44]</sup> Present study did not emphasize on gender distribution. Gender variation and malocclusions are correlated and studies must be performed associating the both. Malocclusion is a prevalent feature in investigation. One-third of adolescents showed the need for orthodontic treatment in Mauise study.<sup>[45]</sup> We have to take into account two significant limitations for the present study: the lack of a control group of adolescents without dental malocclusion and lack of data collection on gender variation.<sup>[46]</sup> Notwithstanding these limitations, our findings pinpoint that dental malocclusion can impact adolescent self-esteem and social contacts, consequently impairing all aspects of quality of life, suggesting the importance of more attention to patient's esthetical appearance and early stage of treatment.<sup>[47]</sup>

## Conclusion

Within the limitations of the present study, Orthodontic treatment needs was seen mostly in males compared to females and increased numbers were mostly in the age group of 17-19 years. Most common orthodontic malocclusion in the adolescents was reported to be crowding. Hence early intervention of orthodontic treatment by creating awareness will improve the success of orthodontic treatment and thereby improve the quality of life of the patients.

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