

PREVALENCE OF SKELETAL AND DENTAL MALOCCLUSION AMONG PATIENTS VISITING A PRIVATE DENTAL COLLEGE

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ABSTRACT

Background:

The goal of orthodontic treatment is to achieve optimal occlusion within the framework of function, stability and esthetics. The oro-facial region is typically an area of serious concern for the individual because it draws the foremost attention from people in interpersonal interactions and is the primary source of vocal, physical, and emotional communication. Thus, this study aimed to evaluate the prevalence of different types of skeletal and dental malocclusion among patients visiting a private dental hospital.

Materials and Methods: A retrospective study was conducted using the case records of patients in University hospital. Data on the class of skeletal and dental malocclusion were collected and analysed for association with age and gender. Descriptive statistics and chi-square association was done.

Results: From the statistical analysis, it can be analysed that orthognathic maxilla and mandible (91.1%) were more commonly seen skeletal mal-occlusion and class 1 molar relationship (95.5%) was the most commonly seen dental malocclusion. Orthognathism of jaws tends to show female predilection (51.3%) when compared to males (39.7%) and most commonly seen among the age group of 15 to 30 years (63.3%). Class I dental mal-occlusion was most commonly seen among the age group of 15 to 30 years (58.2%) and showed higher prevalence in males (54.2%) than females.

Conclusion: Within the limitations of this study, the commonly seen skeletal malocclusion was orthognathic jaws which was commonly seen among the age group of 15 to 30 years, primarily in females. The commonly observed dental malocclusion was class 1 molar relationship commonly seen among the age group of 15 to 30 years and were commonly prevalent among males.

Keywords: Skeletal malocclusion, dental malocclusion, orthognathism, molar relationship, Innovative technology.

INTRODUCTION

Orthodontic anomalies are related to psy- chosocial distress, poor periodontal condition and impaired masticatory function so should be considered ill health . While there is evidence that certain features like traumatic deep overbite, unprotected incisors and impacted teeth may adversely affect the longevity of the dentition, the relationship of dental irregularity to periodontitis, caries and mandibular dysfunction is less certain.(1,2) There has been an increased concern about dental appearance during childhood and adolescence to early adulthood. The general public equates good dental appearance successfully in many pursuits. Generally, societal forces define the norms for acceptable, normal, and attractive physical appearance. Fundamentally, the difficulties seen are because of the very fact that malocclusion isn't a disease

but a morphological variation which may or might not be associated with pathological conditions.(3)

Malocclusion is often defined as an occlusion in which there is a malrelationship between the arches in any of the planes or in which there are anomalies in tooth position, number, form, and developmental position of teeth beyond normal limits.(4) Genetic, environmental, or a combination of both factors, alongside various local factors like adverse or deleterious oral habits can cause malocclusion.(5) Individuals with malocclusion might develop a sense of shame about their dental appearance and may feel shy in social situations or lose career opportunities. Malocclusion also features a large impact on both individuals and society in terms of discomfort, quality of life, and social and functional limitations. The prevalence of malocclusion varies from country to country and between different age and sex groups. It has been shown to affect periodontal health, increase the prevalence of cavities, and cause temporo-mandibular joint problems. (6–8)

The decision to pursue orthodontic treatment is influenced by the desire to seem attractive, self-perception of dental appearance, self-esteem, gender, age, and peer-group norms.(9 - 11) The foremost benefits of orthodontic treatment include improvement of physical function, prevention of tissue damage, and correction of aesthetic components. (12,13) Considering these factors, the Dental Aesthetic Index (DAI), which is recommended by the world Health Organization (WHO) as a rapid and comparatively simple method of assessing dento-facial anomalies, was developed.(14,15) The DAI is an orthodontic index that links clinical and aesthetic components mathematically to produce a single score.

Previously we have worked on many such relevant topics in public health dentistry such as (16–35). The aim of the current study is to analyze the prevalence of different classes of skeletal and dental malocclusion among patients visiting a private dental college.

MATERIALS AND METHODS

Study setting and design

A retrospective study was conducted to analyze the prevalence of different types of skeletal and dental mal-occlusion in patients visiting a private dental college. The study was conducted using case reports of patients visiting the author's University hospital.

Sample selection and criteria

This retrospective study was employed by reviewing all the records of patients who visited the University hospital from March 2020 to March 2021. A total of 38324 records with signed informed consent were sorted. Efforts were made that all the retrieved case records had all the information needed for the study with no duplicates with the help of an external reviewer.

Ethical approval:

Prior permission to utilize the data was obtained from the University and ethical board number for the current study was obtained from the university.

Data collection:

Data on age, gender, type of skeletal and dental malocclusion was collected and tabulated in Microsoft Excel and imported to SPSS statistical analysis of version 23.0. The age of the patients in the case records was categorized for the convenience of statistical analysis such as 15 to 30 years and 31 to 40 years.

Statistical analysis:

The collected data was analyzed using Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive statistics were used to present the prevalence of various classes of skeletal and dental malocclusion and a chi-square association test was done to find the association between various skeletal and dental malocclusion with age and gender. A statistical significance p value <0.05 was considered.

RESULTS :

From the statistical analysis done using SPSS by IBM, it can be well documented that the most commonly observed skeletal relationship was orthognathism of both jaws equally (91.1%) when compared to other skeletal mal-occlusions. P value is 0.00 (less than 0.05) and is statistically significant (Figure 1). The most common age group in which the orthognathism of both jaws

were commonly seen was between 15 to 30 years (63.3%), with p value less than 0.05 showing statistical significance (Figure 2). Orthognathism of jaws tends to show female predilection (51.3%) when compared to males (39.7%) with a significant p value (Figure 3). With regard to dental mal-occlusion class I molar relationship was the most commonly observed dental molar relationship (95.5%) and class III was the least observed dental mal-occlusion (1%). P value was less than 0.05 showing statistical significance (Figure 4). On correlating the age with the type of dental malocclusion seen, class I mal-occlusion was most commonly seen among the age group of 15 to 30 years (58.2%) with significant p value (Figure 5). Class I dental malocclusion showed higher predilection among males (54.2%) (Figure 6).

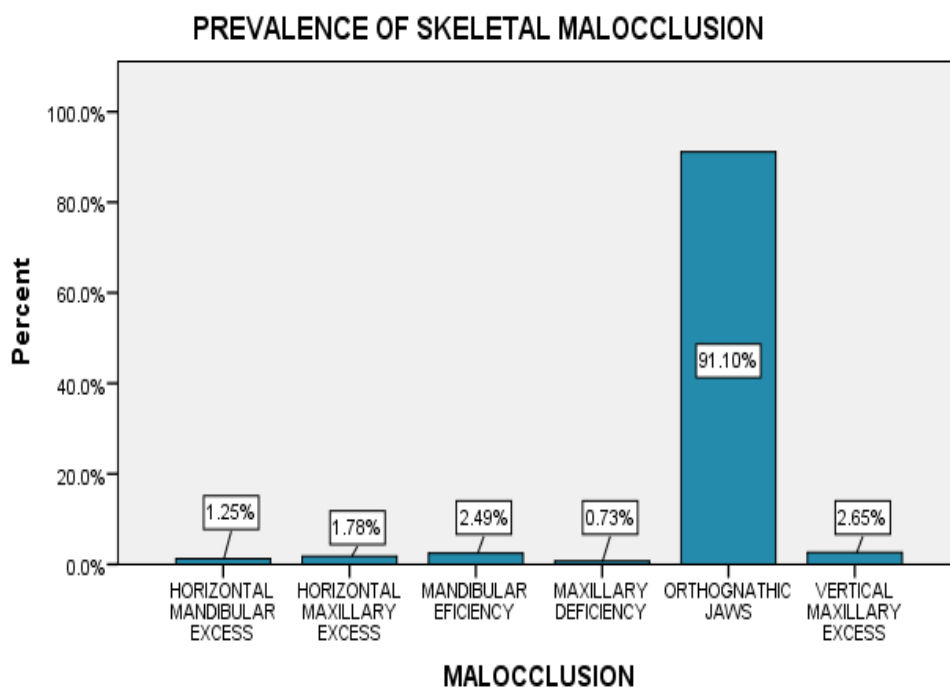


Figure 1: Bar graph showing the percentage of different types of skeletal malocclusion. They are represented in blue. The X axis shows the type of skeletal malocclusion and the Y axis shows the percentages of cases. Orthognathism of jaws was commonly observed with significant p value.

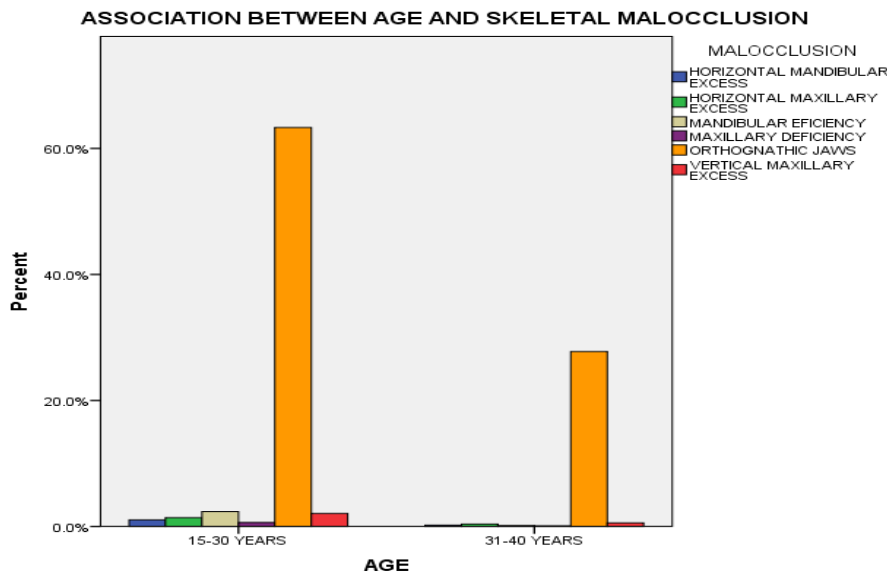


Figure 2: Bar graph showing the association between the age of the patient and the skeletal discrepancy, The X axis represents the age of the patients and the Y axis total percentage of cases. Orthognathism of jaws was more observed among the patient’s age group of 15 to 30 years. (Pearson Chi-Square Value:68.1 ;p=0.000, hence shows statistical significance.)

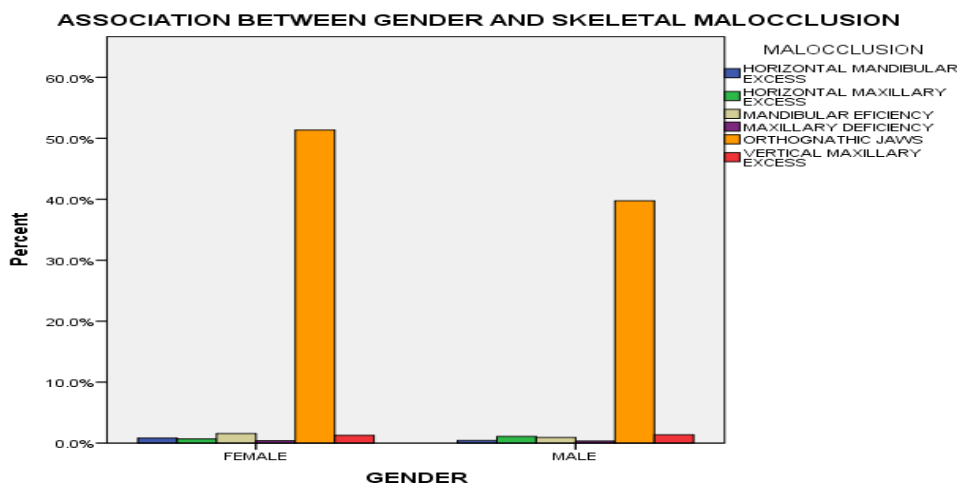


Figure 3: Bar graph showing the association between the gender of the patient and the skeletal discrepancy, The X axis represents the gender of the patients and the Y axis shows the total percentage of cases. Orthognathism of jaws was more observed among the female patients (Pearson Chi-Square Value:25.5 ;p=0.000, hence shows statistical significance.)

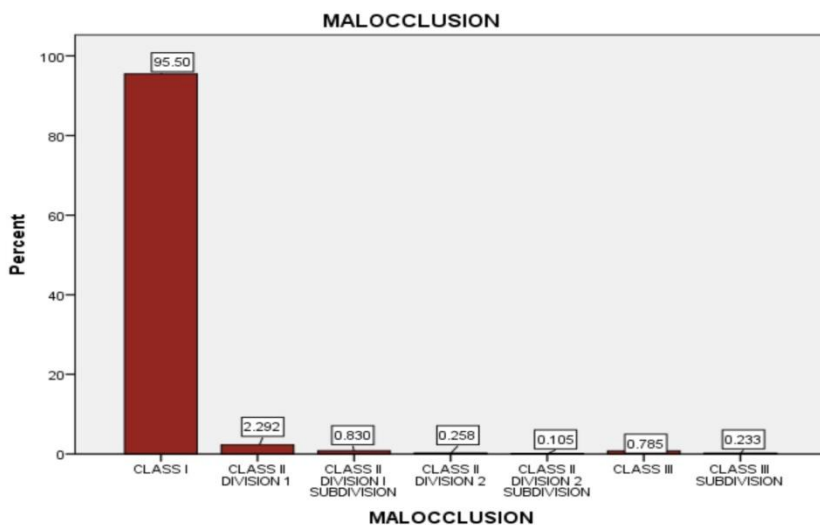


Figure 4: Bar graph showing the percentage of different types of dental malocclusion. They are represented in red. The X axis shows the type of dental malocclusion and the Y axis shows the percentages of cases. Angle’s class 1 was commonly observed with significant p value.

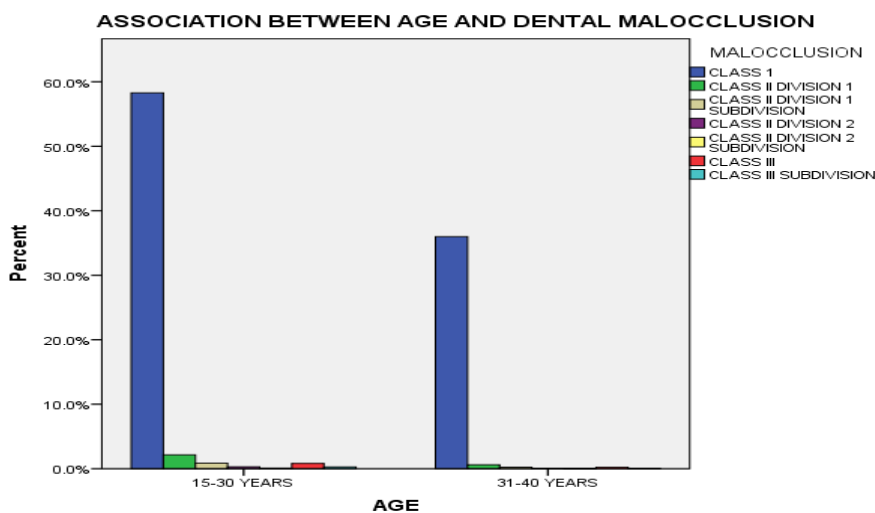


Figure 5: Bar graph showing the association between the age of the patient and the dental discrepancy, The X axis represents the age of the patients and the Y axis shows the total percentage of cases. Class 1 was more observed among the patient’s age group of 15 to 20 years. (Pearson Chi-Square Value:261.1;p=0.000, hence shows statistical significance.)

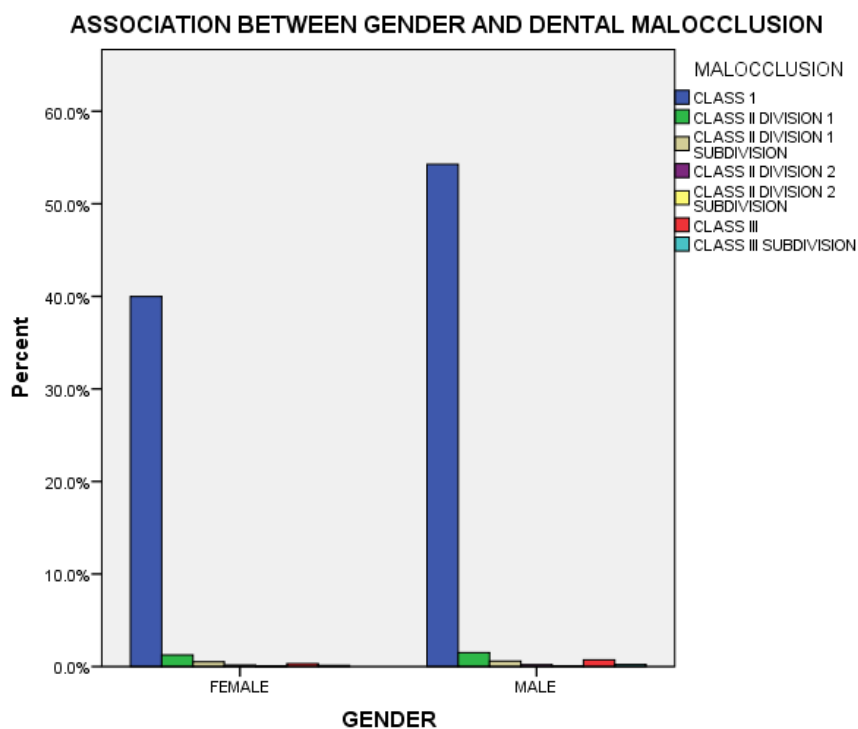


Figure 6: Bar graph showing the association between the gender of the patient and the dental discrepancy, The X axis represents the gender of the patients and the Y axis shows the total percentage of cases. Class 1 dental malocclusion had no specific gender predilection. (Pearson Chi-Square Value:35.3 ;p=0.000, hence shows statistical significance).

DISCUSSIONS:

On commenting about skeletal malocclusion, orthognathism of both maxillary and mandibular units were commonly observed among all age groups and genders (91.1%). Of all the patients considered, 91.1% of them showed orthognathism of both maxilla and mandible, 2.65% of them showed vertical maxillary excess, 0.73% of them showed maxillary deficiency, 2.49% of them showed mandibular deficiency, 1.78% of them showed horizontal maxillary excess and 1.25% of them showed horizontal mandibular excess. Orthognathism of both jaws were most commonly seen among the patients of age 15 to 30 years and most commonly seen among females (51.3%) when compared to males (39.7%). Orthognathism refers to straight-jawed; having the profile of the face vertical or nearly so; having a gnathic index below 98. (36)

With regard to the prevalence of dental malocclusion, class I dental malocclusion was seen in 95.5% of the cases. The results of this study were similar to the one conducted by Ansai et al, in 1993, who had stated class 1 mal-occlusion to be more commonly encountered on clinical examination.(37) The results of the current study was in concordance to the one conducted by Hasan et al., in 2020 who stated Angle's Class I malocclusion to be commonly found with 60.9 % followed by 28.8 % Angle's class II and 10.3 % Angle's class III.(38) Several methods of classifying malocclusions have been described: the one which has gained most widespread use is that of Angle (1898). Angle defined three classes of malocclusion based on the antero-posterior relationship of the upper and lower buccal segments. Class I in which there is a normal antero-posterior relationship; Class II in which the mandibular buccal segments are distal to those of the maxilla and Class III in which they are mesial. Class II malocclusions are further divided into two categories: division 1 in which there is an excessive overjet; and division 2 in which the upper central incisors are retro- clined, the overbite is greater than normal and the overjet normal.(39)

On comparing the age with the type of mal-occlusion, class 1 was most commonly seen among patients of all ages, but more commonly seen in patients between the age of 15 to 30 years (58.2%) with p value less than 0.05 showing statistical significance. This indicates the permanent growth face achieved and treatment and diagnosis not made at the earliest. Class 1 dental mal-occlusion had male predilection (54.2%). It is thus very important to identify the condition at an earlier phase of growth spurt and to correct them at the earliest. It is vital to select the right Orthodontic appliance for better aesthetic and functional restoration. The selection of appliances is based on various factors such as growth potential, type of tooth movement and oral hygiene. Growing patients who exhibit skeletal mal-occlusion should be treated with appliances that modulate growth so that the existing skeletal discrepancy is solved or at least is not worsened. Removable orthodontic appliances can be used in patients requiring simple tipping movement. Whenever bodily tooth movements are required, fixed orthodontic therapy is required. Yet, fixed appliances can pose a great risk of plaque accumulation, decalcification, caries etc., hence care should be taken to maintain proper oral health. Class II dental malocclusions are corrected by growth modification, camouflage or through surgical correction. Class III dental malocclusion

can be corrected during growth phase using myofunctional appliances, chin cup therapy and face mask therapy and can also be corrected using fixed appliances. (40,41)

Limitations of this study include Geographic limitation as predominantly South Indian population were only considered, and was a Unicentric study with few Incomplete and unclear data. The Future scope of this study will yield a better and more accurate result when different ethnic populations are considered.

CONCLUSION:

Within the limitations of the present study, orthognathism of jaws was the most commonly seen skeletal mal- occlusion and Angel's class 1 molar relationship was the most commonly observed Dental malocclusion. With regard to the age and gender association with orthognathism, patients of age 21 to 40 years primarily females possessed orthognathism of both jaws and class 1 dental malocclusion was commonly seen in patients of age 21 to 60 years with no specific sex prediliction. Thus, as a clinician, it is important to determine and devise a better treatment plan to correct the growing Skeletal and dental discrepancy.

AUTHOR CONTRIBUTIONS

Author 1: Akshaya K, carried out the study by collecting data and drafted the manuscript after performing the necessary statistical analysis and in the preparation of the manuscript.

Author 2: ArthiBalasubramaniam, aided in conception of the topic, designing the study and supervision of the study, correction and final approval of the manuscript.

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CONFLICTS OF INTEREST

None declared

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