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PREVALENCE AND ASSOCIATED FACTORS IN SUBJECTS WITH CROSSBITE MALOCCLUSION REPORTING TO A PRIVATE DENTAL HOSPITAL

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ABSTRACT:
Background: Crossbite is a transverse plane malocclusion that can affect a single tooth or numerous teeth, be bilateral or unilateral, and be anterior or posterior.
Aim: To evaluate the prevalence and associated factors for crossbites among subjects visiting private dental college.
Materials and Methods: This retrospective study was carried out with case records of patients reporting to the OP department of saveetha dental college for orthodontic treatment. The data on age, gender, type of crossbite and the arch involved in crossbite of the patients was collected and statistical analysis was done. Using SPSS software, descriptive statistics and chi square test was done.
Results: A total of 430 subjects with crossbites were involved in this study. 21% of the total patients had posterior crossbite whereas 79% of the patients had anterior cross bite. Chi square association between age and the type, number of teeth involved in crossbite was found to be not significant (p value >0.05) whereas association between age and the side of involvement was found to be significant (p value <0.05). A significant association between the gender and type and side of cross bite involved was noted (p value <0.05).
Conclusion: Anterior crossbites with unilateral involvement were more common than posterior crossbites and adult males had a higher prevalence of cross bites than females.

Keywords: Anterior, Epidemiology, Habits, Innovative technique, Malocclusion.

INTRODUCTION:

A crossbite is an occlusal relationship in which a maxillary tooth is lingually positioned relative to an antagonist tooth (or teeth) or the mandibular tooth is facially positioned relative to an antagonist tooth (or teeth). Crossbites can be either dental or skeletal in origin and anterior dental crossbites can also be due to the abnormal axial inclination of the maxillary anterior teeth (1). Anterior dental crossbite occurs in 4-5 percent of the population and is caused by palatal malposition of the maxillary incisors as a result of a lingual eruption path (2). An anterior crossbite is a common occurrence in mixed dentition, and because it is rarely self-corrected, it should be addressed as soon as possible, as it can progress to a more serious malocclusion or cause traumatic injury to the periodontal tissues (3). Correction of dental anterior crossbites may be performed with a removable or fixed appliance or a combination of both. Tongue blades, reversed stainless steel crowns, permanent acrylic planes, bonded resin-composite slopes, and detachable acrylic appliances with finger springs have all been offered as treatments for anterior dental crossbite (5)(6).

Posterior crossbites are one of the most common malocclusions in various dentitions, manifesting as a narrowing of the upper arch's lateral dimensions (7). In the deciduous dentition, the prevalence of this malocclusion was reported to be 8% by Kutin and Hawes (8) and 12% in the mixed dentition by Hanson et al (9). The cause of this malocclusion could be harmful oral habits, early loss of primary teeth, heredity, non-nutritive sucking habits and impaired nasal breathing caused by enlarged tonsils and adenoids (10). According to available research, the prevalence of posterior crossbite ranges from 8 to 16 percent (11)(7). It is crucial to remember that early detection, correction, or referral to a specialist for these occlusal anomalies can help prevent any negative impacts on a child's dental-skeletal-facial complex development (12).

More information is needed in light of the growing interest in early diagnosis and treatment of malocclusions, as well as the accompanying emphasis on preventive therapies. Our team has extensive knowledge and research experience that has translated into high quality publications(13),(14),(15),(16),(17),(18),(19),(20),(21),(22),(23),(24),(25–29)(30),(31),(32).

The burden of malocclusions in a population should be studied to plan for treatment. This study was aimed to assess the prevalence of crossbites in subjects visiting a private dental hospital and evaluate the associated factors.

MATERIALS AND METHODS:

Study Setting:

This retrospective study included subjects with crossbite malocclusion among all patients reporting to Saveetha Dental college seeking orthodontic treatment. Case sheets of these patients were reviewed and data regarding crossbites was collected. The approval for this study was obtained from the scientific review board of SIMATS. Data of patients diagnosed with crossbite were included for the data analysis. Cases with Incomplete record entries were excluded from the study.

Data Collection:

The case records of 430 patients with crossbite were selected and data on parameters like Age , Gender, unilateral/bilateral involvement, single tooth/multiple teeth involvement and associated skeletal malocclusion was collected.

Statistical Analysis:

After collecting data about all parameters tabulation was then and statistical significance was tested using SPSS software (version). The association of crossbites with age, gender, type, and underlying malocclusion was derived using Chi square tests. Statistical significance was defined as a P value of less than 0.05.

RESULTS:

In this study, a total of 430 case records of subjects with crossbite were included with a gender distribution of 57% males and 43% females[Figure 1]. 74% of them were between 19-40 years old, 17% were 6-13 years old and about 9% of them were 14-18 years old [Figure 2]. Out of the total number of patients, about 77% of them had unilateral crossbite whereas 23% of them had bilateral crossbite [Figure 3]. About 54% of the total patients had crossbite involving multiple teeth whereas 46% of them had crossbite involving a single tooth [Figure 4]. Out of all patients diagnosed for crossbite, 78% of the patients had anterior crossbites whereas 21% of them had posterior crossbites [Figure 5]. Class I Angle's malocclusion was found in 86% of patients with crossbite, Class II Div 1 Angle's malocclusion was found in 6%, Class II Div 1 Subdivision Angle's malocclusion was found in 2%, and Class III Angle's malocclusion was found in 5% [Figure 6].

No significant association between age group and type of crossbite, number of teeth involved in cross bite was noted (chi square p value >0.05) (Figure 7,9). The age group and the side of cross bite implicated were found to have a significant correlation (chi square p value <0.05) (Figure 8). Gender was found to have a significant relationship with the type of cross bite and the side of the cross bite ($p<0.05$) (Fig10,11). A significant association between type of cross bite and sagittal malocclusion involved was noted ($p<0.05$) (Fig12).

DISCUSSION:

The present study was done by involving all patients with crossbites reporting to a private dental hospital followed by evaluating their frequency distribution and associations in various age groups, genders, and malocclusions.

In the present study we found that anterior crossbites were more common in all age groups than posterior crossbites. Adults were more likely than children to suffer from unilateral crossbites, and there was a significant association between age and the side of the cross bite implicated (p-0.022<0.05). Crossbites involving multiple teeth were more common in adults but no significant association was noted (p-0.190>0.05) [Figure 9]. Males were more likely to have anterior crossbite, but no significant association was found (p-041>0.05) [Figure 10]. Both unilateral and bilateral crossbites were more common in males with a significant gender association (p-0.015<0.05) [Figure 11]. Both anterior and posterior crossbite were more commonly associated with a class 1 Angle’s malocclusion (p-0.000<0.05) [Figure 12].

In a study done by Asiry et al on prevalence of malocclusion in Saudi Arabia, it was found that posterior crossbite was seen more predominantly when compared to anterior crossbite (33). Previous research has looked at the impact of orthodontic treatment with fixed appliances on the quality of life of children and adolescents. The incidence of anterior crossbite in the deciduous teeth has received little attention. Anterior crossbite was discovered in 3% of patients in the United States, according to a study by Tausche et al. (34).

Functional crossbite, also known as pseudo-Class III, is caused by early dental interference, which drives the mandible forward in order to achieve maximum intercuspation (35). In a recent study it was shown that 57% of the total sample included in the study were diagnosed with crossbite (36). This is in accordance with our study in which

it was found that crossbite was found in 0.5% of the patients reporting to the private dental college. Untreated malocclusion increases the risk of tooth decay, poor oral hygiene, and gingival disease, resulting in pain and functional limitations (37). Studies focusing on the early detection and treatment of malocclusion in primary dentition are becoming more common (38). In a recent study by Zhou et al. it was shown that the prevalence of anterior crossbite was 7% whereas posterior crossbite was 8% (39).

Unilateral posterior crossbite is a common asymmetric malocclusion marked by an inverse relationship between the upper and lower buccal dental cusps in the molar and premolar areas on one side of the dental arch exclusively (40). When chewing on the affected side, children with unilateral posterior crossbite have altered kinematics of the jaw during mastication (41).

Although the current study's goal was attained, more research with a larger sample size from diverse locations of Chennai, India is needed to develop better screening methods for early intervention and prevention of malocclusion.

CONCLUSION:

Within the scope of this study's limitations, it may be determined that anterior crossbites with unilateral involvement were more common than posterior crossbites and adult males had a higher prevalence of cross bites.

These findings will aid in the knowledge of occlusion status and the planning of malocclusion prevention and treatment in Chennai.

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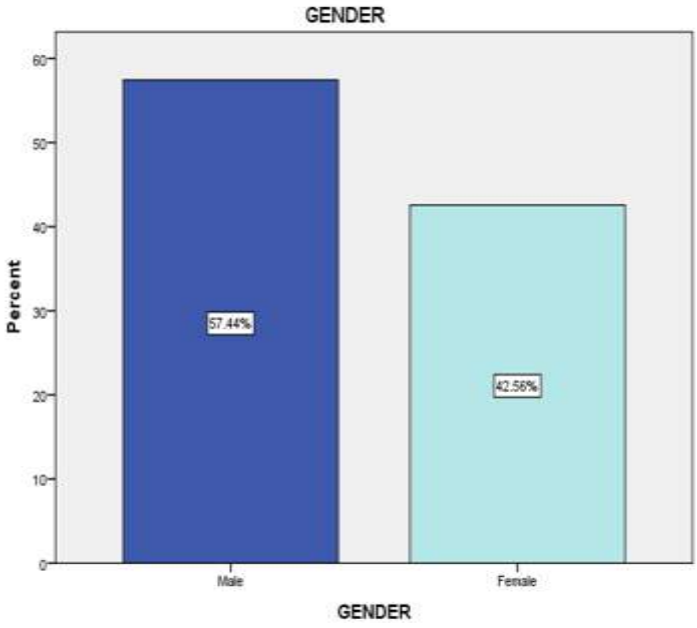

Figure 1: Bar chart representing gender distribution of the included sample. Majority of the patients in this study were males.

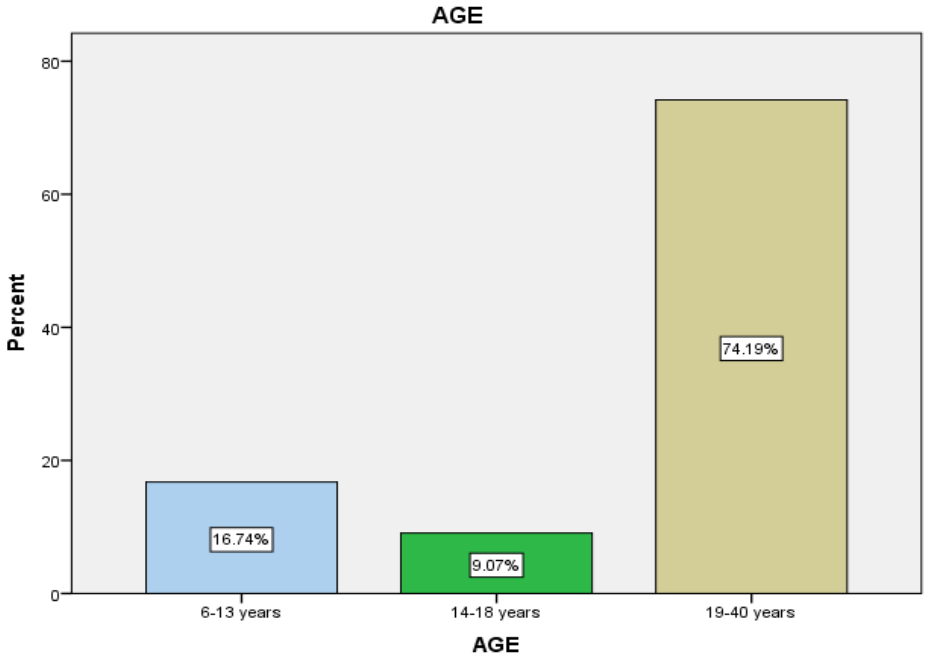

Figure 2: Bar chart representing age wise distribution of the included sample. Majority of the patients were in the age group 19-40 years.

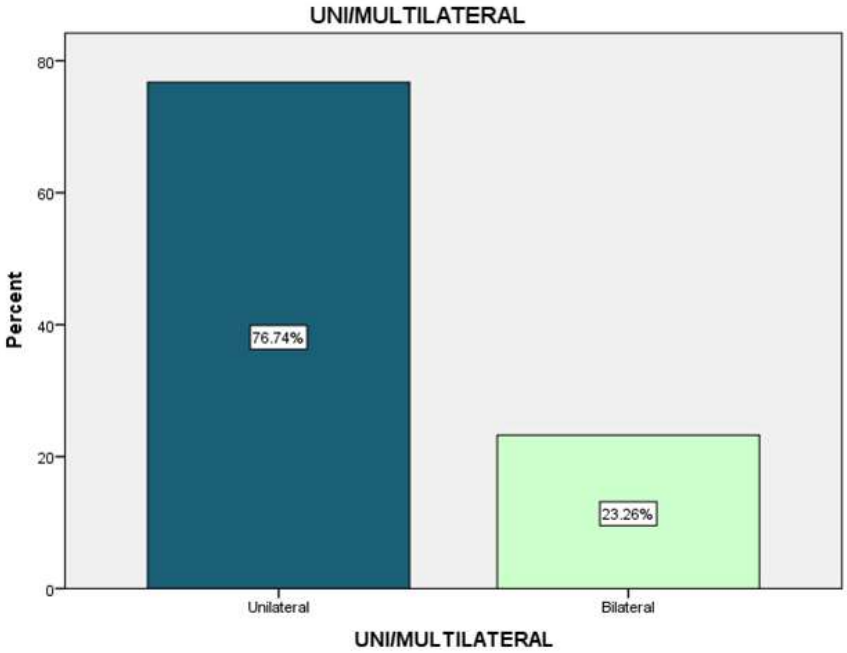

Figure 3: Bar chart representing side involved in crossbites of the included sample. Majority of the patients had unilateral crossbite.

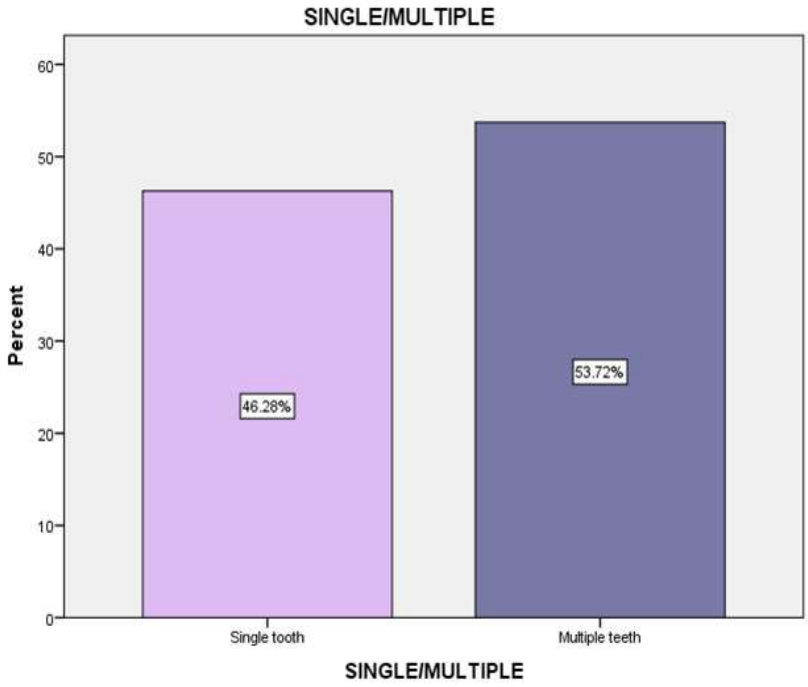

Figure 4: Bar chart representing teeth involved in crossbites of the included sample. Majority of the patients had crossbite involving multiple teeth.

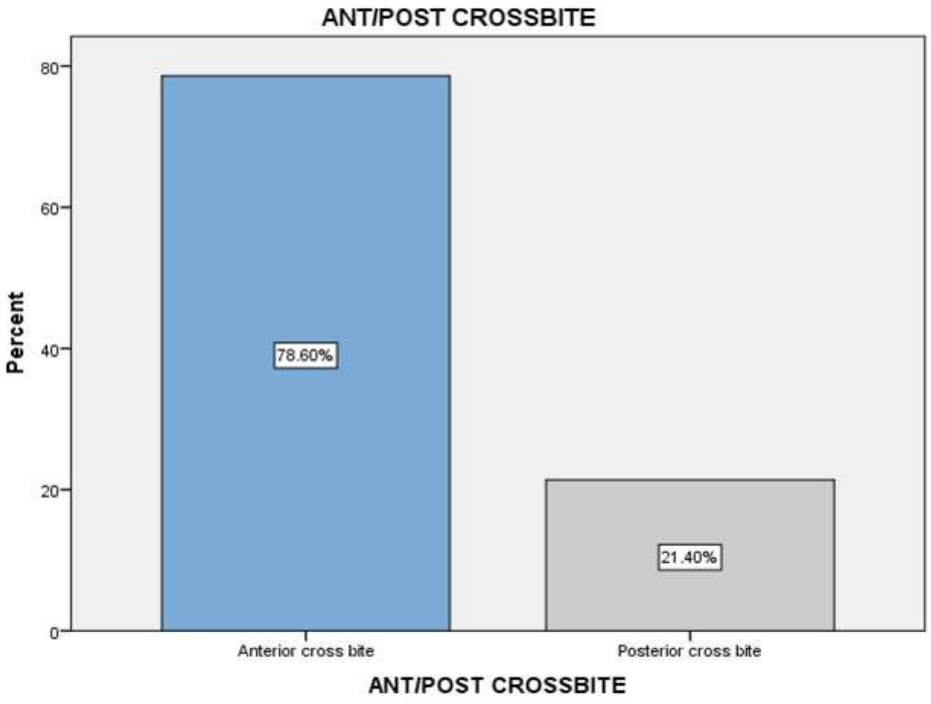

Figure 5: Bar chart representing the type of crossbites in the included sample. Majority of the patients had anterior crossbite.

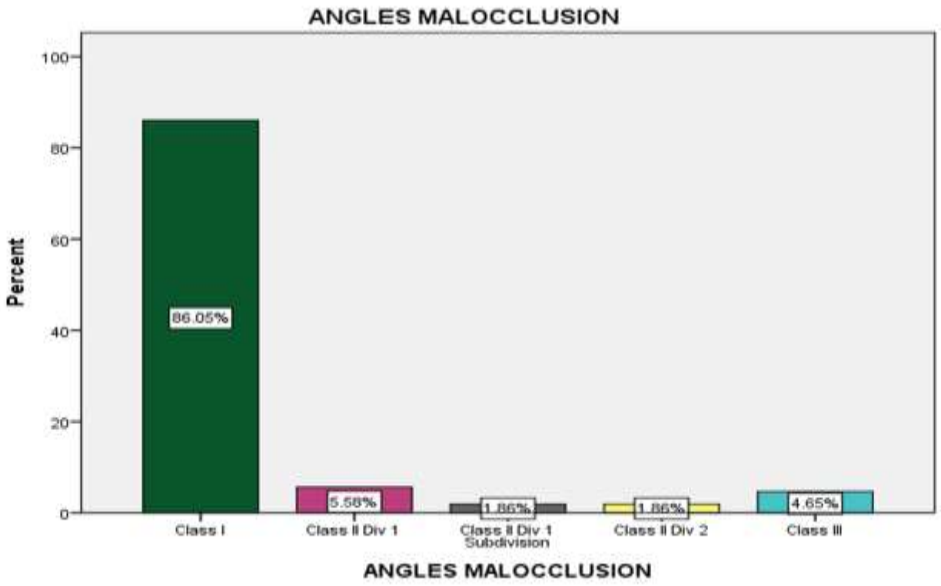

Figure 6: Bar chart representing the underlying malocclusion of the included sample. Class I malocclusion was more predominant among crossbite patients.

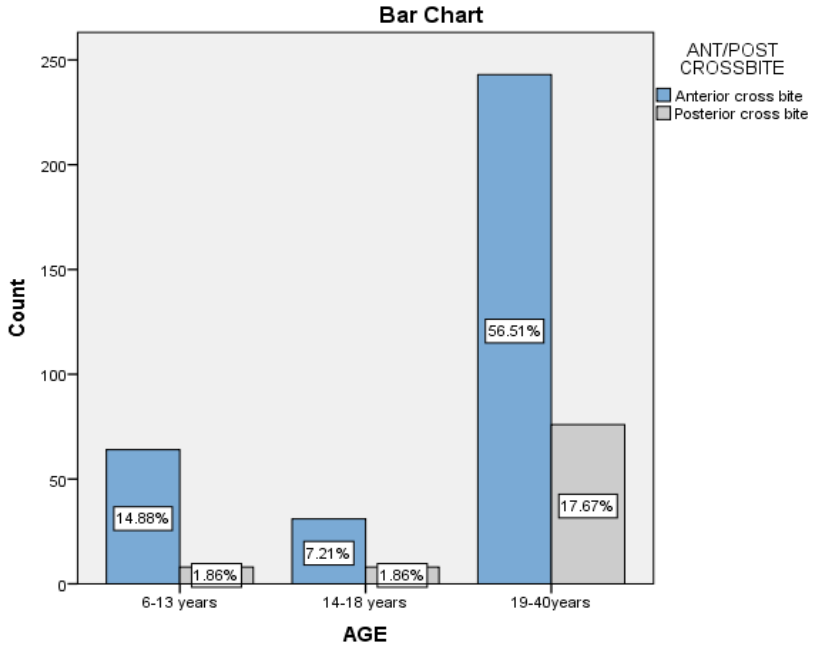

Figure 7: Bar chart representing association between age group and the type of cross bite. Anterior cross bite was common in adults and no significant association between age group and type of crossbite was noted (chi square p value >0.05).

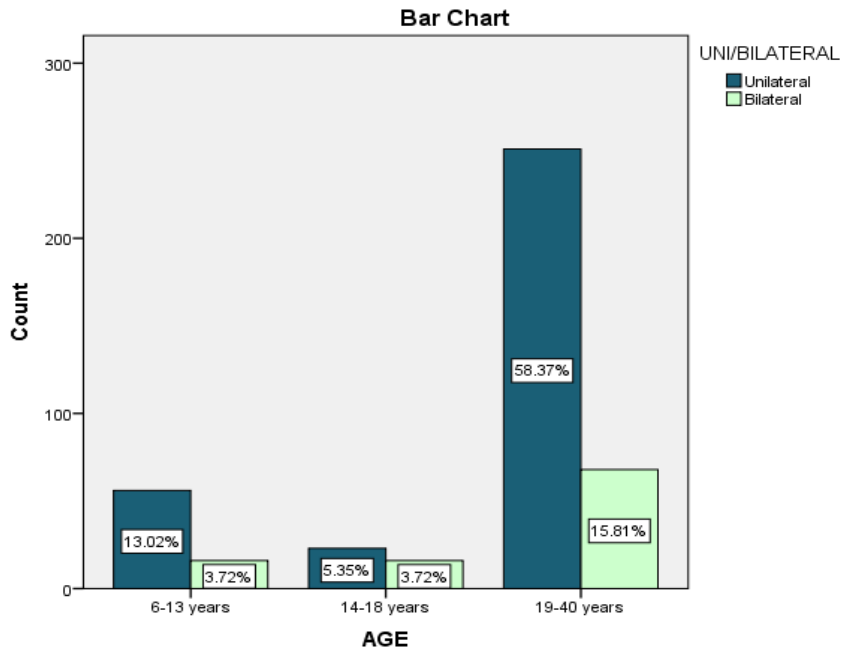

Figure 8: Bar chart representing association of age group and the side of cross bite involved. A significant association was noted and unilateral crossbite was most common in adults. (chi square p value <0.05).

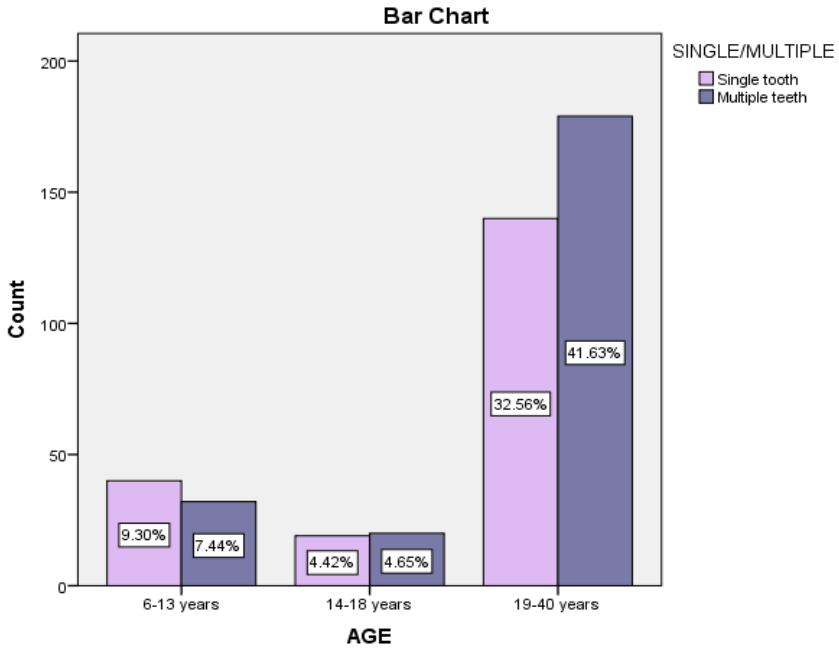

Figure 9: Bar chart representing association of age group and the number of teeth involved in cross bite. No significant association was observed (chi square p value >0.05).

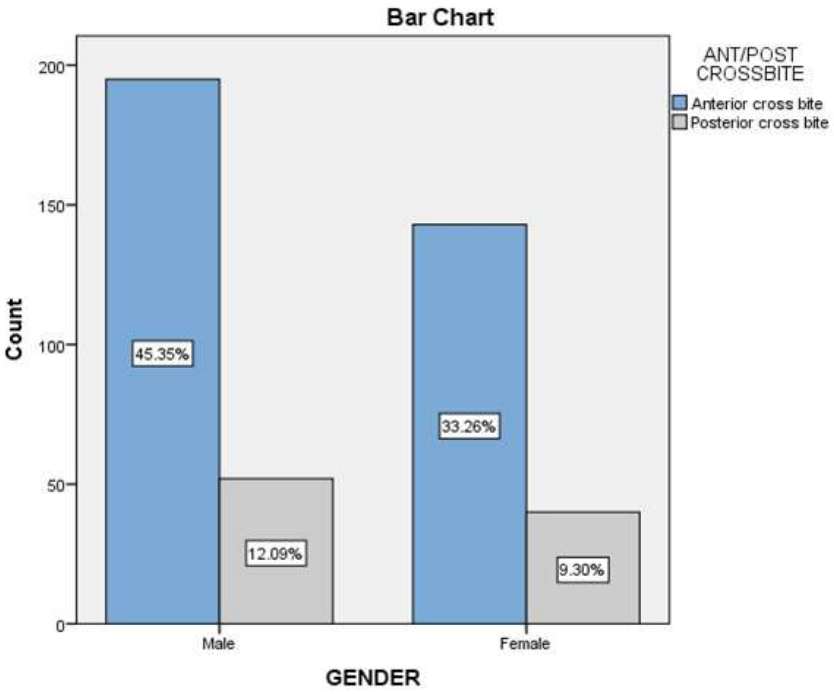

Figure 10: Bar chart representing association of gender with the type of cross bite. A significant association was noted and anterior crossbite was more common than posterior in both males and females ($p<0.05$).

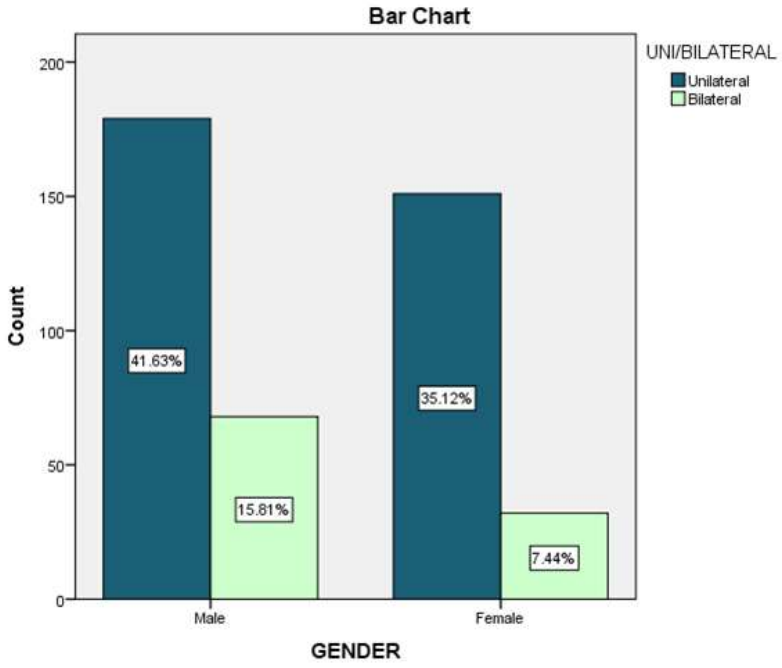

Figure 11: Bar chart representing association of gender and the side involved in cross bite. A significant association was noted and unilateral crossbite was more common than bilateral in both genders (chi square p value <0.05).

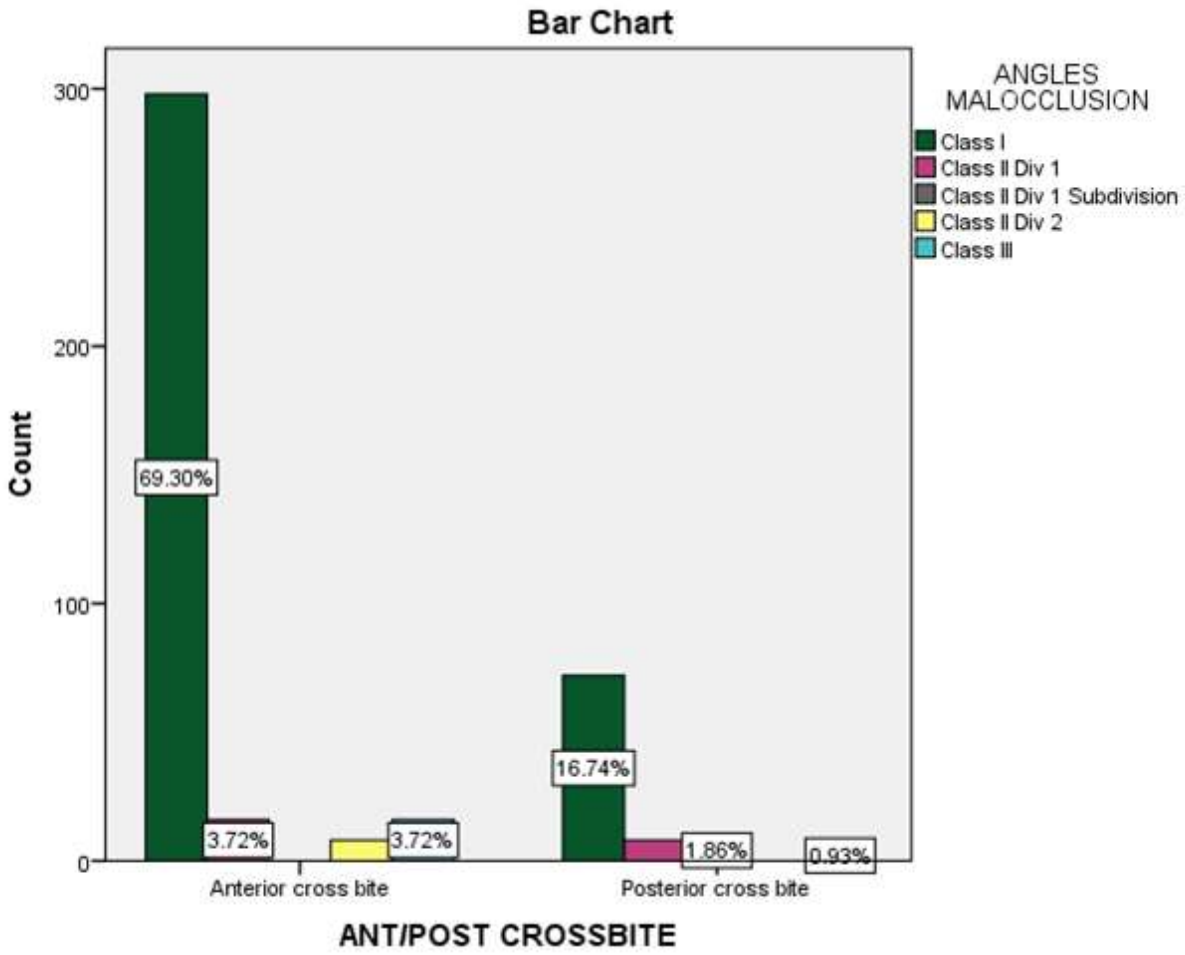

Figure 12: Bar chart representing association between type of cross bite and sagittal malocclusion involved. A significant association was noted and class I malocclusion was more commonly associated with anterior crossbites (chi square p value<0.05).

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