Original Article

OCCURRENCE OF CROSS-BITE AMONG SCHOOL CHILDREN IN JEDDAH CITY; AN OBSERVATIONAL STUDY

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ABSTRACT

Cross-bite is the most crucial orthodontic discrepancy affecting several children worldwide. It progresses in the child's growing stage, which results in functional limitations and compromised esthetics in a few cases. 334 school children were utilized and distributed into two age groups; 6-9 and 9-12 years. Several types of cross-bites were investigated among the study groups anterior cross-bite, unilateral posterior cross-bite, and bilateral posterior cross-bite. The gathered data was analyzed using SPSS version 21. Descriptive statistics, with frequencies and Chi-square test, were completed, and results were displayed in cross-tabulation. Informed consent was taken from the parents of the participating children. As far as the contrast amongst groups was concerned, the prevalence of anterior cross-bite (30%) and posterior unilateral cross-bite (10%) was higher between children of 9 - 12 years old. Conversely, posterior bilateral cross-bite (15%) and cases with no cross-bite (54%) were higher in the 6 – 9 years age group. Anterior cross-bite is more prevalent amongst children than posterior cross-bite. No significant differences in age groups were found as far as the prevalence of various types of cross bites was concerned.

Key words: Cross-bite, School children, Orthodontics, Appliances.

Introduction

Cross-bite is a most crucial orthodontic discrepancy affecting several children worldwide. It progresses in the child's growing stage, which results in functional limitations and compromised esthetics in a few cases. Therefore, it is essential to resolve this problem as soon as possible to stop the child from undergoing permanent facial asymmetry. Interceptive orthodontic treatment is one of the extremely appropriate options in resolving this problem [1]. Speaking of treatment, cross-bites, including a single tooth, can be treated using fixed and removable orthodontic appliances. However, removable devices may fail patients who are not cooperative. However, this barrier can be overcome using fixed appliances, which do not depend on patients' cooperation. These appliances include acrylic inclined planes, bonded resin-composite slopes, etc. [2, 3].

Cross-bite is observed to be prevalent in studies performed in many countries. An investigation was done in Sao Paulo, Brazil, aiming to measure the epidemiology of several cross-bites amongst school children. It was discovered that the unilateral posterior cross-bite was found in most of the participants. In comparison, the least common type of cross -bite was full cross- bite [4]. The posterior cross-bite has been rising in prevalence. In Turkey, a study was performed to determine the prevalence of posterior cross-bite in adolescents. It was revealed that the prevalent type of malocclusion was bilateral cross-bite [5, 6].

The widespread cause of cross-bite is pacifiers or thumb-sucking in children. One more Brazilian study targeted determining the number of cross-bite cases, especially with the history of pacifier use. The findings concluded that the unilateral cross-bite was more than generally observed in children than bilateral [7]. One more investigation conducted in Lahore, Pakistan, investigated the prevalence of cross-bite among male and female children. It was discovered that the females had a substantially greater number of cross-bite than the males [8, 9].

Aims of the study

- To identify the prevalence of various types of cross-bites in school children.
- To contrast among various age groups of school children.

Materials and Methods

This is a cross-sectional study conducted from July 2021 to December 2021, which involved an examination of school children in Jeddah city. 334 school children were included and distributed into two age groups; 6-9 and 9-12 years. Various types of cross-bites were studied among the study groups, comprising anterior cross-bite, unilateral posterior cross-bite, and bilateral posterior cross-bite. The gathered data was analyzed using SPSS version 21. Descriptive statistics, with frequencies and Chi-square test, were completed, and results were displayed in cross-tabulation.

Informed consent was taken from the parents of the participating children.

Clinical examination

Every dental student examined 55±1 schoolchildren applying a mouth mirror, tongue retractors, and disposable gloves. Children aged 6-12 years were involved. However, other age groups were excluded from the study.

Results and Discussion

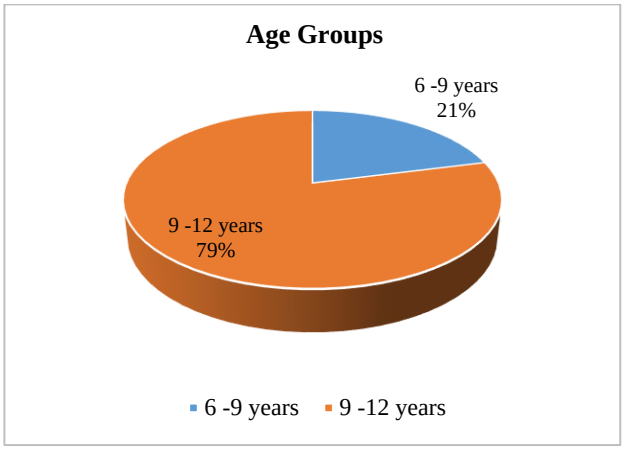

Figure 1. Age group distribution of study subjects

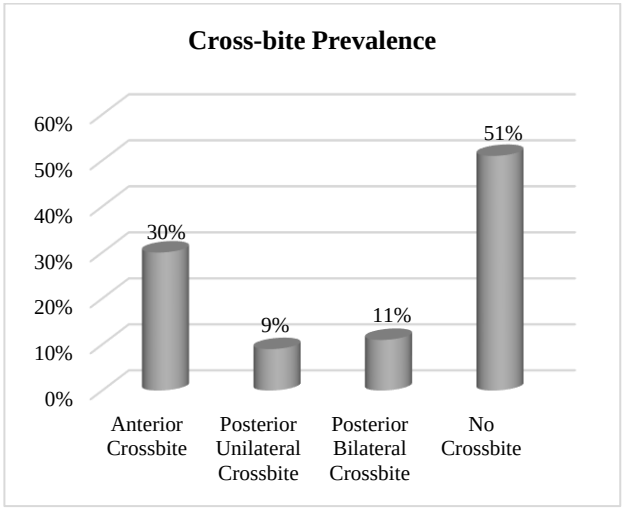

Figure 2. Prevalence of various types of cross-bites among the children

Table 1. Types of cross-bites among various age groups of children

	Type of Cross-bite				
Age groups	**Anterior Cross-bite**	**Posterior Unilateral Cross-bite**	**Posterior Bilateral Cross-bite**	**No Cross-bite**	**P-value**
6 – 9 years	28%	2%	15%	54%	0.258
9 – 12 years	30%	10%	10%	49%	
Total	29%	6%	13%	52%	

School children were separated into 6-9 and 9-12 years groups. The percentages of these participants were 21% and 70%, respectively. In contrast, various cross-bites were noted upon clinical examination of these children. It was pointed out that 30% anterior cross-bite, 9% posterior unilateral, and 10% posterior bilateral cross-bites were amongst the children. Nevertheless, 51% of children did not have any cross-bite **(Figures 1 and 2)**.

As much as the relationship among groups was concerned, the prevalence of anterior cross-bite (30%) and posterior unilateral cross-bite (10%) was greater between 9 - 12 years old. In contrast, posterior bilateral cross-bite (15%) and cases having no cross-bite (54%) were greater amongst the 6 – 9 years age group. Again, though, these relationships were statistically insignificant (p-value: 0.258) **(Table 1)**.

Cross-bite, along with its various types, can be initiated because of habitual causes amongst children at a very young age. Factors, for instance, thumb-sucking and genetics, play a vital role. Cross-bite can occur in children as early as 18 months [10]. This study was performed to identify the prevalence of various types of cross-bites amongst the school children of Riyadh. Male students were involved in this study, which belonged to the two age groups stated above.

In South India, a study by Kaur, Pavithra, and Abraham (2013) discovered the prevalence of various types of malocclusions in adolescent children [11]. Anterior cross-bite was examined in 8% of the total sample. However, merely 1% of the participants revealed posterior cross-bite. When matched these results with our findings, there is a marked change as our study proved a higher prevalence for both types of cross-bites. Though there is a vast variation in the sample sizes of both studies, which might be an essential aspect concerning the findings.

In many of the associated studies, it was noticed that the prevalent type of cross-bite discovered in children was anterior cross-bite. For example, Vithanaarachichi and Nawarathna (2017) observed a high percentage of children with anterior cross-bite (27%), which was nearly related to that of our finding (29%) [12]. Alternatively, a Kuwaiti study demonstrated a relatively low prevalence of cross-bite amongst children. The study subjects detected a mere 2% and 1.5% of anterior and posterior crossbite [13].

Several studies have explained the possible etiologies of cross-bites and the consequent effects on oral health. Sucking habit was seen as the primary cause, whereas the impacts of cross-bite included TMJ problems, caries, and periodontal diseases [14, 15]. However, we did not involve these factors in our study, being the limitation of our investigation. We plan to expand the scope of this study by

incorporating a larger sample size and including the factors mentioned above.

Conclusion

- Anterior cross-bite is more prevalent among children than posterior crossbite.
- No significant differences in age groups were found as far as the prevalence of various types of crossbites was concerned.

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Conflict of interest: None

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Ethics statement: This study is approved by the ethical committee of Riyadh Elm University.

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