

Assessment of Different Type of Malocclusion Among 13 – 17 Years Old School Going Children of Bhilai, Chhattisgarh: A Cross-Sectional Study

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ABSTRACT

Background: Malocclusion is one of the most prevalent conditions, next only to dental caries and periodontal disease. Knowledge about the prevalence and severity of malocclusion is important for early diagnosis and planning of orthodontic services

Material and methods: A descriptive cross sectional study was conducted among 140 participants of age group 13-17 years. Clinical examination was carried out by one experienced examiners using a mouth mirror, small light source and metallic ruler. The following variables were recorded: Angle classification system, Crowding, Overbite, Over jet, Anterior cross bite, Posterior cross bite, Diastema.

Results: In study total participants were 140 in which 57.14% were male and 42.85% were females. Class 1 malocclusion had the highest frequency of 61.42%, class II div-1 was 12.85%, class II div-2 was 15.71%, class III was 10%. The normal overjet and overbite values were highest 67.14%, 68.57%, respectively. Frequency of Crowding was observed in 52.85%, diastema was present in 7.4%, anterior cross bite was 12.85% and posterior cross bite was 32.14%.

Conclusion: This study shows that Class I molar relationship was prevalent among the participants. Normal overjet and overbite were more common findings. The most prevalent malocclusion trait was crowding. The baseline information outlined in the present study can be appropriately utilized for the future planning to meet the orthodontic treatment needs among the population.

Keywords: Malocclusion, overjet, overbite, Crowding, anterior cross bite, posterior cross bite.

INTRODUCTION

In India, children form about 38 to 40% of its 1,090 million total population and 85% of them have high levels of dental disease. It is reported that about 35% of children suffer from maligned teeth and jaws affecting their proper functioning. Children

who suffer from pain of dental origin are more likely to have more restricted activity days including missing school than those who do not. In worldwide Public Health Dental Disease Priorities, malocclusion features the third highest in

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prevalence. Malocclusion is considered one of the most common dental problems together with dental caries, gingival disease and dental fluorosis.¹ Malocclusion is a clinically significant variation from the normal range of growth and morphology. In contrast to disease and pathologic lesions, malocclusion may just a minor variation from the normal.² Occlusal traits vary among different ethnic groups, and so is the prevalence and severity of malocclusion. A large number of studies on the prevalence of malocclusion have been done in the past. The reported studies showed that prevalence of malocclusion among Indian subjects is as low as 19% to as high as 90%.³ Facial appearances has a long lasting implication on an individual. An unacceptable dental appearance has often been associated with a negative effect on self-image, career advancement and peer-group acceptance. In order to prevent a wide-spread impact on their psychological development, children having very severe or handicapping malocclusion should be identified and corrective measures should be instituted at the earliest.⁴ Identifying occlusal status in particular population provides important information on treatment needs and enables the government to draw the appropriate preventive and treatment programs.⁵ In view of all the above, it seemed necessary to carry out a study like the one proposed here, in order to assess the prevalence of malocclusion, among 13- to 17-year-old school-going children in Bhilai, Chhattisgarh.

MATERIAL AND METHODS

Brief Profile and Study Population

A cross sectional study was conducted among 140 participants of age group 13-17 years. Before commencement of study, ethical approval was taken from the Department of Orthodontics, Rungta College of Dental Sciences And Research, Bhilai.

Study Design

Participants with no previous orthodontic treatment done, secondary dentition present with no remaining deciduous teeth, all had their first permanent molars, no previous extraction, no caries lesion that causes change in the tooth size or shape were included in the study. Participants with severe systemic diseases or syndromes, Syndromic condition, Previous growth modification therapy,

participants aged above or below the age, participants who have already undertaken or are in orthodontic treatment, participants with extensive carious lesions or with permanent teeth were excluded from the study.

Ethical Clearance, Official Permission, and Informed Consent

Ethical clearance was obtained from the Institutional Review Board. The study was conducted in accordance with the Declaration of Helsinki. The required official permission to select, examine, and collect the relevant data from selected subjects was solicited and obtained from the Dean of the Rungta College Of Dental Sciences and Research. Informed consent was obtained from parents/guardians of subjects after explaining the purpose and the involved procedures of the study for children.

Clinical examination was carried out using a mouth mirror, small light source and metallic ruler.

The following variables were recorded:

1. Angle classification system: was recorded as Class I when the mesiobuccal cusp of the maxillary first permanent molar occluded with the mesiobuccal groove of the mandibular first permanent molar on both sides. A Class II or Class III molar relation was recorded when the mesiobuccal cusp of the maxillary first permanent molar occluded at least one-half cusp width anterior or posterior to the mesiobuccal groove of the mandibular first permanent molar on both sides, respectively.
2. Crowding: It was recorded when the total sum of slipped contacts measured in the segment was at least 2 mm.
3. Overbite: The vertical overlap of incisors measured to the nearest half millimeter vertically from the incisal edge of the maxillary right central incisor to the incisal edge of the corresponding mandibular right incisor.
4. Overjet: It was measured with millimeter ruler as the distance from the most labial point of the incisal edge of the maxillary incisors to the most labial surface of the corresponding mandibular incisor.

5. Anterior cross bite: It was recorded when one or more of the maxillary incisors occluded lingual to the mandibular incisors.
6. Posterior cross bite: It was recorded when the buccal cusp of one or more of the maxillary posterior teeth occluded lingual to the buccal cusps of the opposing mandibular teeth.
7. Diastema: It was recorded when the space more than 1 mm between central incisors.

RESULTS

In our study total participants were 140 in which 57.14% were male and 42.85% were females. Class 1 malocclusion had the highest frequency of 61.42%, class II div-1 was 12.85%, class II div-2 was 15.71%, class III was 10%. The normal overjet and overbite values were highest 67.14%, 68.57%, respectively. Frequency of Crowding was observed in 52.85%, diastema was present in 7.4%, anterior cross bite was 12.85% and posterior cross bite was 32.14%.

Table 1: Distribution of gender.

Gender	N(%)
Male	80(57.14%)
Females	60(42.85%)

Table 2: distribution of malocclusion.

Variable	N(%)
Angle's classification	
Class I	86(61.42%)
Class II Div 1	18(12.85%)
Class II Div 2	22(15.71%)
Class III	14(10%)
Overjet	
Normal	94(67.14%)
Increase	26(18.57%)
Decrease	20(14.28%)
Overbite	
Normal	96(68.57%)
Increase	18(12.85%)
Decrease	26(18.57%)
Anterior cross bite	18(12.85%)
Posterior cross bite	45(32.14%)
Crowding	74(52.85%)
Diastema	10(7.4%)

DISCUSSION

Dentofacial appearance has a lot to do with the way the people are perceived in the society.⁶ Adolescents with significant dentofacial harmonies are considered at risk for negative self-esteem and social maladjustments.⁷ Malocclusion can cause different problems for the patient, such as psychosocial problem related to impaired dentofacial aesthetics, problems with oral functions including difficulty in jaw movements, temporomandibular joint disturbances, difficulty in mastication, swallowing and speech, greater susceptibility to trauma and accentuated periodontal disease.⁸

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The high incidence of malocclusion with Angle's Class I malocclusion as the most predominant among all the types in this study was consistent with the previous studies as reported by Sidhu,⁹ Prasad, and Savadi.¹⁰ However, results of few of the studies as done by Rao et al. which reported a low incidence of malocclusion.¹¹

Kharbanda showed higher prevalence of Class III malocclusion in Delhi¹², and by Tewari¹³ in Punjab. Lower prevalence of Class III malocclusion was reported by Jacob and Mathew^{14,15} in Trivandrum.

Gelgor et al., examined 2,329 teenagers in central Anatolia, Turkey, revealed that the most common type of malocclusion was Class II division 1 (40%).¹⁶

Gul-e-Erum and Fida who found that Pakistani orthodontic patients have a higher percentage of Class II malocclusion (70.5%).¹⁷

CONCLUSION

This study shows that Class I molar relationship was prevalent among the participants. Normal overjet and overbite were more common findings.

The most prevalent malocclusion trait was crowding.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Dhar V, Jain A, Van Dyke TE, Kohli A. Prevalence of gingival diseases, malocclusion and fluorosis in school-going children of rural areas in Udaipur district. *J Indian Soc Pedod Prev Dent*. 2007 Apr-Jun;25(2):103-5. PubMed PMID: 17660647.
2. Dr Suresh Babu , Dr Chandu , Dr Shafilulla (2005) Prevalence of malocclusion and orthodontic treatment needs among 13-15 year old school going children of Davangere city , Karnataka , *Journal of Indian association of Public health Dentistry*, vol issue 6 ,pg 32-35
3. Kharbanda OP, Sidhu SS, Sundaram K, Shukla DK. Oral habits in school going children of Delhi: A prevalence study. *J Indian Soc Pedod Prev Dent* 2003;21:120-4
4. Houston WJ (2000) Walther's Orthodontic notes (4th edition),The Stonebridge publishers,pp.46-50
5. Asiry MA. Occlusal status among 12-16 year-old school children in Riyadh, Saudi Arabia. *J Int Oral Health*. 2015 May;7(5):20-3. PubMed PMID: 26028897.
6. Dunning JM. Principles of Dental Public Health, 4th ed, Cambridge.
7. Emmanuel OA (2008) Prevalence of malocclusion among school children in Benin City, Nigeria. *Journal of Medicine and Biomedical Research* 7(1-2): 58- 65.
8. Kumar DA, Varghese RK, Chaturvedi SS, Agrawal C, Fating C, Makkad RS. Prevalence of malocclusion among children and adolescents residing in orphanages of Bilaspur, Chhattisgarh, India. *J Adv Oral Res* 2012 Sep-Dec;3(3):21-28.
9. Sidhu SS. Incidence of varieties of malocclusion. *J Indian Orthod Soc* 1968;1:17-20.
10. Rajendra PA, Savadi SC. Epidemiology of malocclusion-a report of a survey conducted in Bangalore city. *J Indian Orthod Soc* 1971;3:43-55.
11. Rao N, Bhat KS, Venkateshwarlu M, Subrahmanyam MV. Oral health status of 500 school children of Udupi. *J Indian Dent Assoc* 1980;52:367-70.
12. Kharbanda OP. What is the prevalence of malocclusion in India? Do we know the orthodontic treatment needs of our country? *J Indian Orthod Soc* 1999;32:33-41.
13. Tewari A. Relationship of the incidence of malocclusion with the socioeconomic status of people. *J Indian Dent Assoc* 1966;37:192-200.
14. Jacob PP, Mathew CT. The overbite and overjet relation in different types of occlusion in Kerala. *J Indian Orthod Soc* 1969;2:17-23.
15. Jacob PP, Mathew CT. Occlusal pattern study of school children (12-15 years) of Trivandram city. *J Indian Dent Assoc* 1969;41:271-4.
16. Gelgör İE, Karaman Aİ, Ercan E. Prevalence of malocclusion among adolescents in central anatolia. *Eur J Dent*. 2007 Jul;1(3):125-31. PubMed PMID: 19212555.
17. Fida M. Pattern of malocclusion in orthodontic patients: a hospital based study. *J Ayub Med Coll Abbottabad*. 2008 Jan-Mar;20(1):43-7. PubMed PMID: 19024184.