Assessment of Dental Aesthetic Index Among School Children of Bilaspur, Chhattisgarh: A Pilot Study

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ABSTRACT

Background: Malocclusion is one of the most widespread oral health problems that the society is facing. There is increased concern for dental appearance during adolescents to early adulthood. Most of the malocclusion can be corrected if detected early by correctional methods. This study is to know the prevalence of malocclusion and orthodontic treatment needs among 12-15yr old school children of Bilaspur.

Materials and Methods: A total of 351 study subjects were selected based on convenience sampling and examination was carried out under natural light and data was recorded using WHO Proforma 1997. The collected data was subjected to statistical analysis using SPSS16.

Results: Out of the 351 children examined, 46.2% were boys & 53.8% were girls and their mean age was 13.89yrs. One and two segment crowding were seen in 24.5% & 11.4% respectively. Normal molar relation was seen in 80.3% of children. Definite, severe and very severe or handicapping malocclusion was seen in 9.7%, 4.3% & 3.4% of children respectively. There is no statistically significant difference in malocclusion status between boys and girls.

Conclusion: Only 4.3% and 3.4% of children required highly desirable and mandatory orthodontic treatment needs.

Keywords: Malocclusion, Dental Aesthetic Index, Orthodontic Treatment needs.

INTRODUCTION

Dentofacial appearance has a lot to do with the way the people are perceived in the society.[1] People equate good dental appearance with success in many aspects.[2] Social interactions that have a negative effect on self-image, career advancement and a peer group acceptance have been associated with an unacceptable dental appearance.[3] The prevalence of malocclusion varies from country to country and among different races.[1] The reasons to develop malocclusion could be genetic or environmental and/or combination of both the factors along with various local factors such as adverse oral habits, tooth anomalies, form and developmental posit ion of teeth can cause

malocclusion. Orthodontics has traditionally focussed on children and adolescents.[4] There is an increases concern for dental appearance during adolescents to early childhood has been observed.[2] Malocclusions are 3rd in the ranking of priorities among the problems of dental public health worldwide, surpassed only by dental cavity and periodontal diseases.[5] The benefits of taking orthodontic treatment are to prevention of tissue damage and correction of aesthetic component, improve the physical function[2]. A variety of indices have been developed to assist professionals in categorizing malocclusion according to the treatment needs[6]. Dental Aesthetic Index (DAI) introduced by Cons et al(1986), which links clinical and aesthetic components. It was developed originally based on North American Caucasian sample.[7] The World Health Organization concerning to acknowledge the real malocclusions conditions in different countries, adopted it as a cross cultural index and advocated it in the 4th Edition of the Manual of Basic Oral Health Survey, so there would be a suitable instrument to gather epidemiological data collection and assessment of orthodontic treatment needs [5,7-9]. DAI is proven to be reliable, valid, versatile, simple and easily applied index[7-10]. Most of the malocclusion can be corrected if detected early by correctional methods.[10-16] This study was intended to evaluate the prevalence of malocclusion, its severity and the orthodontic treatment needs using DAI, among 12-15yr old school children of Bilaspur, Chattishgarh.

MATERIALS AND METHODS

The present study was conducted among 12-15yr old school children of Bilaspur, Chattishgarh. The schools were selected based on convenience sampling. A total of 351 school children of both sexes were selected for the study based on convenience sampling. Approval was obtained from the concerned authorities before the start of the study. All examinations were performed at schools while children were seated on chair under normal illumination. The examiners were trained and intra-examiner calibration was done. Kappa statistics showed a good agreement. Sufficient number of autoclaved instruments was taken to the examination site. The WHO Proforma (1997) was used to assess the malocclusion. Data collected was coded, processed and subjected to statistical analysis using SPSS version19.

Table 1. Age wise distribution of study population.

AGE	FREQUENCY	PERCENTAGE
12	13	3.7
13	95	27.1
14	133	37.9
15	110	31.3
TOTAL	351	100

Table 2: Distribution of DAI component

Dai Components		Percentage (%)
Crowding	0	64.1
	0ne Segment	24.5
	Two Segment	11.4
Spacing	0	89.7
	0ne Segment	8.5
	Two Segment	1.7
Diastema	0	94.3
	1-3	5.7
Largest Maxillary Irregularity(Mm)	0	80.9
	0-3	17.1
	>3	2
Largest Mandibular Irregularity(Mm)	0	72.1
	0-3	27.6
	>3	0.3
Maxillary Overjet (Mm)	0-3	76.4
	>3	23.6
Mandibular Overjet(Mm)	0	99.4
	>3	0.6
Open Bite(Mm)	0	99.1
	>3	0.9
Molar Relation	Normal	80.3
	Half Cusp	14.8
	Full Cusp	4.8

RESULTS

The study population consisted of about 351 school children aged 12-15years in Bilaspur city, out of which 46.2% were males and 53.8% were females (Table 1). Table 2 shows the distribution of DAI components. Out of 351 school children, 24.5% had one segment crowding and 11.4% had two segments crowding. One and two segment spacing was seen in 8.5% and 1.7% school children respectively. Diastema of 1-3mm was seen among 5.7% of the study subjects. Largest maxillary irregularity of 0, 1-3 and >3mm was seen among 80.9%, 17.1% and 2% of school children respectively. Largest mandibular irregularity of 0, 1-3 and >3mm was seen among 72.1%, 27.6% and

Table 3: Distribution of the subjects according to dai scores, severity of malocclusion, treatment needs and gender (p=3.946).

DAI SCORE	Severity Of Malocclusion	Treatment Indicated	MALE (%)	FEMALE (%)	TOTAL (%)
<25	No/ minor Malocclusion	No/slight Treatment	84	81.5	82.6
26-30	Definite Malocclusion	Elective	8	11.1	9.7
31-35	Severe Malocclusion	Highly Desirable	3.1	5.3	4.3
>35	Very severe or handicapping malocclusion	Mandatory	4.9	2.1	3.4
TOTAL			100	100	100

0.3% of school children respectively. Maxillary over-jet of 0-3mm is considered normal and was seen among 76.4% of school children and >3mm was seen among 23.6%of school children. Mandibular overjet of 0-3mm was among 99.4% of school children and 0.6% of them had >3mm of overjet. Open bite of >3mm was seen among 0.9% of study subjects. Molar relation was normal among 80.3% of school children whereas half cusp and full cusp molar relation was seen among 14.8% and 4.8% of school children. There was no statistically significant difference between the DAI scores and the gender. Table 3 shows the distribution of according to DAI score, severity of malocclusion, treatment indicated and gender. 4.3% and 3.4% of the study subjects had severe and very severe malocclusion respectively and required highly desirable and mandatory orthodontic treatment needs.

DISCUSSION

Many epidemiological studies have been conducted worldwide utilizing various indices for quantifying the extent of malocclusion.[1,17-19] Crowding of incisal segment affects half of all children in mixed dentitions and it worsens in adolescent years as the permanent teeth erupt and continues to increases as the age progresses.[2,20] In the current study, 35.9% of the study population had incisal crowding. The results of the current study are in correlation with the study conducted by Shivakumar et al[2] and in contrast with a study conducted by Bhardwaj et al[1]. Both the upper and lower incisal segments were examined for spacing. In the present study, 10.2% had incisal segment spacing either in one or both the arches which was in correlation with the study conducted by Artenio Jose Isper Garbin et al[5]. Diastema>1mm was seen among 5.7% of school children and this result was in correlation to the study conducted by Artenio Jose IsperGarbin et al[5]. Irregularity may occur with or without crowding. In the current study, 19.1% of the children had maxillary anterior irregularity of >1mm, and the results are in correlation with the study conducted by Shivakumar et al[2] and Artenio Jose IsperGarbin et al[5]. 27.9% had mandibular anterior irregularity >1mm and the result were in contrast with the study conducted by Bhardwaj et al[1], DS Rwakatema et al[8], B. Eduardo and F.M Carlos[9].

In the present study, maxillary overjet of >3mm was seen in 23.6% and it was similar to the study conducted by B. Eduardo and F.M Carlos[9] and Bhardwaj et al[1] and in contrast to a study conducted by Matilda Mtaya et al[10]. Mandibular overjet of >3mm was seen in 0.6% of school children and it was in correlation with studies conducted by Shivakumar et al[2], DS Rwakatema et al[8], Bhardwaj et al[1] and Artenio Jose IsperGarbin et al[5].

An anterior openbite of >3mm was seen in 0.9% of school children which was similar to studies conducted by Bhardwaj et al[1] and B. Eduardo and F.M Carlos[9]. Normal molar relation was seen in 80.3% of the school children and which was similar to the study conducted by Bhardwaj et al[1] and was in contrast with the study conducted by Artenio Jose IsperGarbin et al[5]. Definite malocclusion was seen in 9.7% of the school children, severe

malocclusion was seen in 4.3% of school children and very severe or handicapping malocclusion was seen in 3.4% of children. Similar results were found in the study conducted by Vijaya Hedge and RekhaShenoy[11], Bhardwaj et al[1] and Shivakumar et al[2], whereas it was in contrast with the study conducted by B. Eduardo and F.M Carlos[9] and D.S Rwakatema et al[8].

CONCLUSION

Thus the present study concluded that out of 351 study subjects, 4.3% and 3.4% of school children required highly desirable and mandatory type of orthodontic treatment needs respectively. The information from this study forms a part of the basis not only for further research, but also for planning orthodontic care.

CONFLICTS OF INTEREST

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

REFERENCES

1. VK Bhardwaj, KL Veeresha and KR Sharma. Prevalence of malocclusion and orthodontic needs among 16 and 17year old school going children in Shimla city, Himachal Pradesh. Indian Journal of Dental Research 2011;22(4): 556-560.

2. Shivakumar KM, Chandu GN, Subba Reddy VV, et al. Prevalence of malocclusion and orthodontic treatment needs among middle and high school children of Davangere city, India by Dental Aesthetic Index. J India SocPedodPrev Dent 2009; 27:211-218.

3. H. Nihal, B. Guvenc and U. Ersin.Dental Aesthetic Index scores and perception of personal dental appearance among Turkish university students. European Journal of Orthodontics 2009; 31: 168-173.

4. B.A Carlos, M.C Jose-Maria, M.P David, et al. Orthodontic treatment need in Spanish young adult population. Med Oral Patol Oral Cir Bucal 2012; 17(4):638-643.

5. I.G Artenio Jose , P.P Paulo Cesar, S.G CleaAdas, et al. Malocclusion prevalence and comparison between the Angle classification and the Dental Aesthetic Index in scholars in the interior of Sao Paulo state- Brazil. Dental Press J Orthod 2010; 15(4):94-102.

6. Poonacha KS, Deshpande SD, Shigli AL. Dental Aesthetic Index, applicability in Indian population: a retrospective study. J Indian PedodPrev Debt 2010; 28: 13-17.

7. B. Venkatesh, Gopu H. Assessment of Orthodontic treatment needs according to Dental Aesthetic Index. Journal of Dental Sciences and Research 2011; 2(2):9-13.

8. D.S Rwakatema, P.M. Ng'ang'a and A.M. Kemoli. Orthodontic treatment needs among 12-15 year olds in Moshi, Tanzania. East African Medical Journal 2007; 84(5): 226-232.

9. B. Eduardo and F.M Carlos. Orthdontic treatment need in Peruvian young adults evaluated through Dental Aesthetic Index. Angle Orthodontist 2006; 76(3): 417- 421.

10. M Matilda, B. Pongsri and A. Anne Nordrehaug. Prevalence of malocclusion and its relationship with socio-demographic factors, dental caries and oral hygiene in 12 to 14 year old Tanzanian school children. European Journal of Orthodontics 2009; 31: 467-476.

11. H. Vijaya and S. Rekha.Dentition status, treatment needs and malocclusion status among 15 year old school children of Mangalore- a pilot study. JIDA 2010; 4 (12): 568-569.

12. Tschill T, Bacon W, Sonko A. Malocclusion in the deciduous dentition of Caucasian Children. Eur J Orthod 1997;19:361-7. 13.

13. Hashim SM, Gnanasundaram N. Incidence and etiology of midline diastema in a population in South India (Madras). Angle Orthodontist 1988;59:277-8.

14. Corruccini RS: An epidemiologic transition in dental occlusion in world populations. Am J Orthod 1984;86:419-26.

15. Gelgör IE, Karaman AI, Ercan E. Prevalence of malocclusion among adolescents in central anatolia. Eur J Dent 2007;1:125-31.

16. Singh AA. Malocclusion and its traits in rural school children. J Indian Orthod Soc 1998;31:76-80.

17. Borzabadi-Farahani A, Borzabadi-Farahani A, Eslamipour F. Malocclusion and occlusal traits in an urban Iranian population. An epidemiological study of 11- to 14-year-old children. Eur J Orthod 2009;3:477-84.

18. Burgersdijk R, Truin GJ, Frankenmolen F, Kalsbeek H, van't Hof M, Mulder J. Malocclusion and orthodontic treatment need of 15-74 years old Dutch adults. Community Dent Oral Epidemiol 1991;19(2):64-7.

19. Mugonzibwa EA, Eskeli R, Kuiipers-Jagtman AM, Laine-Alava MT, Van't Hof MA. Occlusal characteristics during different emergence stages of the permanent dentition in Tanzanian Bantu and Finnish children. Eur J Orthod 2004;26:251-60.

20. Tausche E, Luck O, Harzer W. Prevalence of malocclusion in the mixed dentition and Orthodontic treatment need. Eur J Orthod 2004;26:237-44.