IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 1 Ver. V (Jan. 2015), PP 60-65
www.iosrjournals.org

Prevalence of Malocclusion and Treatment Needs Among 12 to 15 Years Old School Children in Muradnagar Uttar Pradesh

Dr. Abhinav Sharma[1] Dr. Ipseeta Menon[2] Dr. Aruna D S[3] Dr. Arti Dixit[4]
[1] *Senior Lecturer, Public Health Dentistry I.T.S – Dental College hospital and Research Centre, 47,Knowledge Park-III, Greater Noida Uttar Pradesh, India*
[2] *Reader, Public Health Dentistry, I.T.S Dental College, Muradnagar Ghaziabad.*
[3] *Professor and HOD, Public Health Dentistry, I.T.S Dental College, Muradnagar Ghaziabad.*
[4] *Senior Lecturer, Public Health Dentistry Vaidik Dental College and Research Centre, Nani Daman, Daman and Diu.*

Abstract:
Background: *Malocclusion is considered to be a Dental public health problem. It is the second most common dental disorder in children and young adults next to dental caries. The major benefits of orthodontic treatment include improvement of physical function, prevention of tissue damage, and correction of aesthetic components.*
Aim & Objectives: *The aim of the study was to determine the prevalence of malocclusion and orthodontic treatment needs among 12-15 year old school children according to Dental Aesthetic Index in Muradnagar, Uttar Pradesh.*
Material And Methods: *A cross sectional study was conducted by the Department of Public Health Dentistry, I.T.S-Dental college, Muradnagar among 1012 school children aged 12 to 15 year of Muradnagar, Uttar Pradesh. A survey proforma was prepared with the help of WHO Oral Health Assessment Form. The components of the form that were used were:General information, Dentofacial which were analysed through Dental aesthetic Index.Significance is assessed at 5% level of significance.The Statistical software namely SPSS 16.0 was used for the analysis of data.*
Results: *The overall prevalence of malocclusion according to DAI score came out to be 33.1%, 66.1% of participants didn't required any treatment or had minor malocclusion, out of 33.1% - 22.2% required elective treatment, for 6.5% treatment was highly desirable and 4.4% required mandatory treatment.The mean DAI score for the study was 23.1. In the present study males had slightly higher mean DAI scores (23.11) than females (22.82).*
Conclusion: *The results of this study indicate a high prevalence of malocclusion in 12-15 year old school going children in Muradnagar.*
Keywords: *Malocclusion, Dental Aesthetic Index, School children, Orthodontic treatment needs*.

I. Introduction

People health and consequently the health of society have great influence on development and abilities of the community. A prevention of oral disease is considered to be the most effective, acceptable and efficient method implicated to pave the way to oral health. Dental health education implementation at early period of life & during adolescence is; a key development period of life needs to prioritized to promote oral health.

The physical appearance of an individual may be the single variable feature that has the greatest impact on self-esteem, behavioural patterns and personal interactions. Individual perceptions, physical and psychosocial functions, opportunities to lead a normal life and social interaction – all of these factors are critical for evaluating the impact of health care services on an individual.[1]

Malocclusion is "any deviation from normal occlusion of teeth". The teeth are in abnormal position in relationship to the basal bone of the alveolar process, to the adjacent teeth and/or to the opposing teeth. According to Angle "occlusion is the normal relation of the occlusal inclined planes of the teeth when the jaws are closed".[2]

Malocclusion is considered to be a Dental public health problem. It is the second most common dental disorder in children and young adults next to dental caries.[3] The interest and awareness in dental health has increased considerably over the last few years, likewise the increasing demand for orthodontic care globally urges the need to develop various methods to assess and grade malocclusion in order to prioritize the treatment.[4] Increased concern about dental appearance during childhood and adolescence to early adulthood has been observed. The public equates good dental appearance with success in many pursuits[5] of their life.

The prospect of Dental Aesthetic Index (DAI) in assessing malocclusion in Dental public health is that it links mathematical, objective, clinical, and subjective aesthetic factors to produce a single score that reflects both aspects of the malocclusion[6] needs to be explored. The paucity of data on malocclusion in the study area guided to conduct the present study to assess the prevalence of malocclusion and orthodontic treatment needs in 12-15 year school children in Muradnagar, Uttar Pradesh.

II. Material And Methods

A cross sectional study was conducted by the Department of Public Health Dentistry, I.T.S-Dental college, Muradnagar among 12 to 15 year school children of Muradnagar, Uttar Pradesh.A pilot study was carried out in the month of August- September 2011. A group of 100 subjects were selected using convenient sampling and examined according to the criteria set for the study.

The sample size was determined based on the results of pilot study the sample size was estimated to be 1052.Out of which 10 children were excluded from the study as the questionnaires were not filled correctly; 18 children were absent on the day of examination and 12 parents did not give consent to participate in the study. So a total of 1012 comprised as the final sample size.

Prior to the conduct of the study the survey protocol was approved by the Ethical clearance Committee of I.T.S-Centre for Dental Studies and Research, Muradnagar, Ghaziabad. Permission was obtained from the school authorities. Informed written consent was taken from the parents of the students through school authorities to participate in the study followed by the verbal consent of the students.

All the children between the age of 12 to 15 year attending schools in Muradnagar,the children whose parents gave informed written consent for examination, present on the day of examination on their respective schools.Medically compromised individuals and children who were absent on the day of examination were excluded. There was no substitution for children who could not be examined on the day due to sickness or poor co-operation.

A survey proforma was prepared with the help of WHO Oral Health Assessment Form.[7] The components of the form that were used were:

a) General information
b) Dentofacial anomalies(DAI)[7](Table 1)

Descriptive statistical analysis was carried out in the present study. Results on categorical data were compared by applying chi-square (Pearson's) test and Fischer exact test. The continuous data was compared by applying student t-test or one way ANOVA followed by Post-HOC comparison using bonferri test. Significance is assessed at 5% level of significance.The Statistical software namely SPSS 16.0 was used for the analysis of data and Microsoft word and Excel has been used to generate graphs, tables etc.

III. Results

A total of 1012 chilren participated in study Figure 1 & 2 represents distribution of participants according to age(12years-332,13 years-254,14 years-230,15 years-196) and gender(661 males & 351 females).

Table 2 represents the prevalence of malocclusion and treatment needs according to DAI score, it was seen that 4.4% (very severe malocclusion), 6.5% (Severe malocclusion), 22.2% (Definite malocclusion) and 66.9% (No abnormality or minor malocclusion).

Table 3 represents age wise distribution of DAI scores in the study population. Among 12 years old the mean DAI scores was 22.63 ± 6.468, among 13 years old it was 23.08 ± 6.392 and among 14 years old and 15 years old it was 22.85 ± 6.899 and 23.77 ±7.167 respectively. Overall mean DAI score of the study population was 23.01 ± 6.691. The difference was not found to be statistically significant p-0.292.

Table 4 represents gender wise distribution of DAI scores in the study population. Among 661 males mean DAI score was 23.11 ± 7.078 higher as compared to females 22.82 ± 5.898. The difference was not found to be statistically significant p-0.512.

Table 5 represents distribution of DAI components according to age and gender.Number of missing teeth and A-p molar relation was found to be significantly associated with age.

IV. Discussion

This study provides database on prevalence of malocclusion and treatment needs according to Dental aesthetic index and its association with various deleterious oral habits among school going children in the age group of 12-15 years in Muradnagar, Uttar Pradesh.

In the present study the mean DAI score was 23.01 which is in accordance with the studies done by **Otuyemi OD et al** ,[7] **Estioko et al** ,[8] **Danaei S.M et al** [9] had shown the mean DAI scores of 22.3, 24.1 and 23.5 respectively. However it was higher as compared to **Naveen B et al** [4] which had DAI score 18.5.This difference might be due to a larger sample size of the study and urban study setting which would affect the patient awareness and timely intervention of dental care.

In the present study males had slightly higher mean DAI scores (23.11) than females (22.82). It is similar with the results obtained by **Esa R et al**[10] **and Naveen B et al** [4] whereas studies done by **Ansai T et al** ,[11] **Otuyemi OD et al**[12] and **Ogunyinka A et al**[7] found no difference in mean DAI scores among males and females. The higher mean DAI score among males than females in the present study may be due to variation in dentofacial morphology for boys and girls in this part of the world.

In the present study 66.9% of children did not require any treatment, 22.1% required elective treatment 6.5% had dental appearance which required highly desirable treatment and 4.4% required mandatory treatment. These results are similar with the studies done by **Danaei S.M** [9] 70.1% (No treatment), but studies done by **Shivakumar KM et al** [5] 80.1% (No treatment) and **Naveen kumar B et al** [4] 83.4%(No treatment) have shown lower treatment needs than the present study. Variations in growth, facial skeleton development and development of occlusion may be the cause for difference in DAI scores. In the present study though there some marginal increase in DAI scores among 13 and 15 years (23.08 and 23.77) respectively, than 12 years and 14 years, it was not statistically significant.

V. Conclusion

The present study was conducted to ascertain the prevalence of malocclusion among 12 to 15 years old school going children of Muradnagar. The results of this study indicate a high prevalence of malocclusion in 12-15 year old school going children in Muradnagar. These finding established reliable base-line data regarding the prevalence, distribution, and severity of malocclusion as well as useful epidemiological data on the orthodontic treatment needs of 12-15 year children in Muradnagar.

The guidelines need to framed which would not only help the practioners in making clinical decisions in preventing malocclusions but also provide anticipatory guidance and preventive counseling for not only children and adolescents but also the parent or caregivers which would be a key in success of such a programme.

Acknowledgement

We acknowledge the cooperation of individuals who participated in study.

References

[1]. Nagarjun S, Krishnappa P. The Relationship of malocclusion as assessed by the Dental Aesthetic Index (DAI) with perceptions of aesthetics, function, speech and treatment needs among 14-15 year old school children of Bangalore, India. Oral Health Prev Dent 2010; 8: 221 -228.
[2]. Angle EH. Classification of malocclusion. Dent Cosmos 1988;41: 248-264.
[3]. Pankaj S. Prevalence of malocclusion and orthodontic treatment needs among 12-15 years school children using dental aesthetic index (DAI); J Ind Assoc Public Hlth Dent 2010; 15: 81-84.
[4]. Naveen KB, Mohapatra A, Ramesh N, Ravishankar Tl. Prevalence Of Malocclusion And Orthodontic Treatment Need Among 12-15 Years Old School Children In Davangere, Karnataka, India. Pakistan Oral and Dental Journal 2010;1: 181-185.
[5]. Shivakumar KM, Chandu GN, Subha Reddy VV, Shafiulla MD. Severity of malocclusion and orthodontic treatment needs among 12 to 15 Year Old School Children of Davangere District, Karnataka, India. Eur J Dent 2010 ; 4(3): 298–307.
[6]. Otuyemi OD, Kolawole KA. Perception of Orthodontic Treatment need: Opinion comparisons of patients, parent and orthodontists. African journal of oral health 2005; 2 (1,2): 42-52.
[7]. World Health Organization. Oral Health Surveys – Basic Methods, 4th Ed, Geneva, WHO, 1997.
[8]. Otuyemi OD, Ogunyinka A, Dosumu O, Cons NC, Jenny J : Malocclusion and orthodontic treatment need of secondary school students in Nigeria according to the Dental Aesthetic Index (DAI). Int Dent J 1999 ; 49 : 203-210.
[9]. Estioko LJ, Wright FA, Morgan MV. Orthodontic treatment need of secondary school children in Heidelberg victoria, an epidemiologic study using Dental Aesthetic Index. Community Dent Health 1994 ; 11 (3) : 147-151.
[10]. Danaei SM, Amirrad F, Salehi P. Orthodontic treatment needs of 12-15 year old students in Shiraz, Islamic Republic of Iran. Eastern mediterranean health journal 2007; 13(2): 326-334.
[11]. Esa R, Razak IA, Allister JH. Epidemiology of malocclusion and orthodontic treatment need of 12-13 years old Malaysian school children. Community Dent Health 2000; 18: 31-36.
[12]. Ansai T, Miyazaki H, Katoh Y, Yamashita Y, Takehara T, Jenny J, Cons NC. Prevalence of malocclusion in high school students in Japan according to DAI. Community Dent Oral Epidemiol 1993; 21 (5): 303-305.
[13]. Tarvit DJ, Freer T. Assessing malocclusion – the time factor. Br J Orthod 1998 ; 25 (1) : 31-34.

VI. Tables And Figures

Figure 1:-Distribution of study population according to age

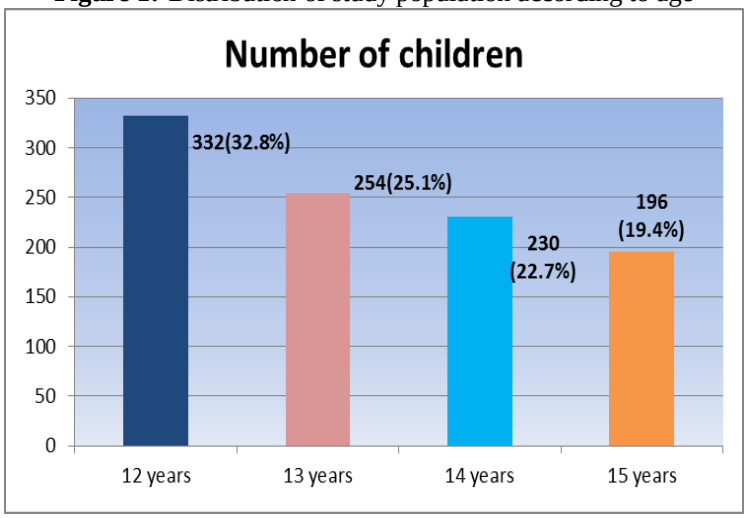

Figure 2:-Distribution of study population according to Gender

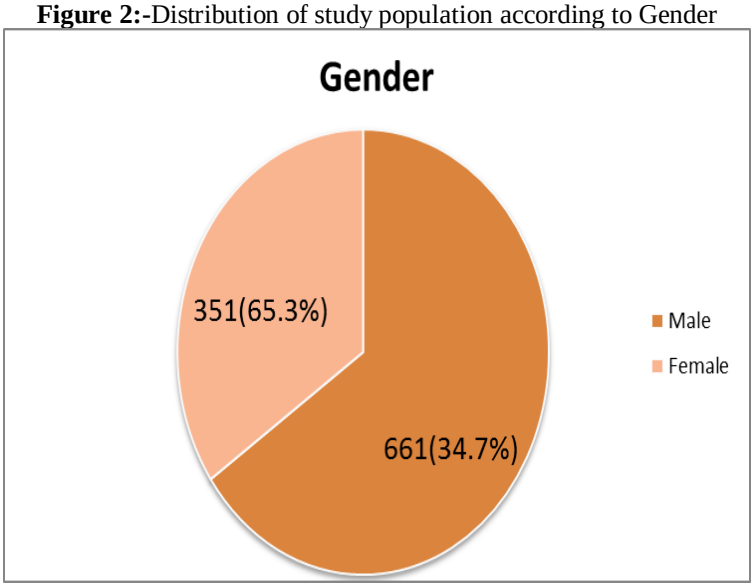

Table 1: DAI scores for Malocclusion and trearment needs

Severity of malocclusion	**Treatment indication**	**DAI Score**
No abnormality or minor malocclusion	No or Slight need	<25
Definite malocclusion	Elective	26-30
Severe Malocclusion	Highly desirable	31-35
Very severe or handicapping	Mandatory	>36

Table 2:- Prevalence of malocclusion according to dental aesthetic index in study population

DAI Score		**Treatment Needs**	**Prevalence**	**95% Confidence Interval**
≤25	No or slight need	**No abnormality or minor malocclusion**	66.9%	69.9- 69.7
26-30	Elective	**Definite malocclusion**	22.11%	21.5-24.87
31-35	Highly desirable	**Severe malocclusion**	6.52%	5.08-8.22
≥36	Mandatory	**Very severe or handicapping**	4.44%	3.26-5.90

Table 3:-Mean DAI score according to age of the study population

Age (in years)	Number of children	Mean DAI Score	S.D
12	332	22.63	6.468
13	254	23.08	6.392
14	230	22.85	6.899
15	196	23.77	7.167
Total	1012	23.01	6.691

P-0.292

Table 27:-Mean DAI score according to age of the study population

Age (in years)	Number of children	Mean DAI Score	S.D
Male	661	23.11	7.078
Female	351	22.82	5.898
Total	1012	23.01	6.691

P-0.512

Table 5- Distribution of DAI components by age and gender of study population

DAI COMPONENTS		AGE (in years)				p-value	Gender		p-value
		12	13	14	15		Male	Female	
Number of missing Teeth	0	312(94%)	247(97.2%)	228(99.1%)	193(98.5%)	**0.003**	637(96.4%)	343(97.7%)	**0.170**
	1-2	9(2.7%)	1(0.4%)	0(0%)	2(1%)		9(1.4%)	3(0.9%)	
	2-4	8(2.4%)	4(1.6%)	2(0.9%)	0(0%)		9(1.4%)	5(1.4%)	
	>4	3(0.9%)	2(0.8%)	0(0%)	1(0.5%)		6(0.9%)	0(0%)	
Crowding in incisal segment	No crowding	134(40.4%)	108(42.5%)	108(47%)	78(39.8%)	**0.601**	302(45.7%)	126(35.9%)	**0.007**
	One segment crowding	101(30.4%)	83(32.7%)	53(23%)	50(25.5%)		177(26.8%)	110(31.3%)	
	Two segment crowding	97(29.2%)	63(24.8%)	69(30%)	68(34.7%)		182(27.5%)	115(32.8%)	
Spacing in incisal segment	No spacing	248(74.7%)	175(68.9%)	175(76.1%)	148(75.5%)	**0.703**	477(72.2%)	269(76.6%)	**0.270**
	One segment spacing	55(16.6%)	43(16.9%)	43(18.7%)	25(12.8%)		118(17.9%)	48(13.7%)	
	Two segment spacing	29(8.7%)	36(14.2%)	12(5.2%)	23(11.7%)		66(10%)	34(9.7%)	
Midline diastema	0 mm	279(84%)	209(82.3%)	196(85.2%)	168(85.7%)	**0.833**	555(84%)	297(84.6%)	**0.410**
	1 mm	38(11.4%)	30(11.8%)	19(8.3%)	18(9.2%)		65(9.8%)	40(11.4%)	
	2 mm	12(3.6%)	8(3.1%)	14(6.1%)	7(3.6%)		31(4.7%)	10(2.8%)	
	3 mm	3(0.9%)	5(2%)	0(0%)	3(1.5%)		8(1.2%)	3(0.9%)	
	>4 mm	0(0%)	2(0.8%)	1(0.4%)	0(0%)		2(0.3%)	1(0.3%)	
Maxillary irregularity	>1mm	141(42.5%)	108(42.5%)	109(47.4%)	64(32.7%)	**0.155**	268(40.5%)	154(43.9%)	**0.307**
	0mm	191(57.5%)	146(57.5%)	121(52.6%)	132(67.3%)		393(59.5%)	197(56.1%)	
Mandibular irregularity	>1mm	131(39.5%)	104(40.9%)	101(43.9%)	59(30.1%)	**0.146**	251(38%)	144(41%)	**0.344**
	0mm	201(60.5%)	150(59.1%)	129(56.1%)	137(69.9%)		410(62%)	207(59%)	
Maxillary overjet	0 mm	18(5.4%)	9(3.5%)	13(5.7%)	3(1.5%)	**0.197**	21(3.2%)	22(6.3%)	**0.18**
	1-2 mm	57(17.2)	67(26.4%)	32(13.9%)	37(18.9%)		133(20.1%)	60(17.1%)	
	2-4 mm	220(66.3%)	132(52%)	161(70%)	129(65.8%)		402(60.8%)	240(68.4%)	
	>4 mm	37(11.1%)	46(18.1%)	24(10.4%)	27(13.8%)		105(15.9%)	29(8.3%)	
Mandibular overjet	0 mm	320(96.4%)	241(94.9%)	221(96.1%)	183(93.4)	**0.165**	633(95.8%)	332(94.6%)	**0.216**
	1-2 mm	9(2.7%)	9(3.5)	6(2.6%)	8(4.1%)		20(3%)	12(3.4%)	
	2-3 mm	3(0.9%)	1(0.4%)	3(1.3%)	4(2%)		7(1.1%)	4(1.1%)	
	>3 mm	9(0%)	3(1.2%)	0(0%)	1(0.5%)		1(0.2)	3(0.9)	

Openbite	0 mm	314(94.6%)	245(96.5%)	224(97.4%)	179(91.3)	**0.345**	638(96.5%)	324(92.3%)	**0.25**
	0-1 mm	6(1.8%)	6(2.4%)	4(1.7%)	7(3.6%)		10(1.5%)	13(3.7%)	
	1-2 mm	12(3.6%)	2(0.8%)	2(0.9%)	8(4.1%)		10(1.5%)	14(4%)	
	2-3 mm	0(0%)	0(0%)	0(0%)	2(1%)		2(0.3%)	0(0%)	
	>3 mm	0(0%)	1(0.4%)	0(0%)	0(0%)		1(0.2%)	0(0%)	
A-P Molar relationship	**Normal**	263(79.2%)	187(73.6%)	181(78.7%)	134(68.4%)	**0.006**	494(74.7%)	271(77.2%)	**0.286**
	Half Cusp	53(16%)	62(24.4)	38(16.5%)	41(20.9%)		129(19.5%)	65(18.5%)	
	Full cusp	16(4.8)	5(2%)	11(4.8%)	21(10.7%)		38(5.7%)	15(4.3%)	