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AIMS: Prevalence of malocclusion among school children in Western Maharashtra

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Abstract
A total of 483 school children who had no previous history of any orthodontic treatment were assessed for malocclusion (molar relation, spacing and crowding.)
Methods: A total of 483 students were screened for a period of 2 months from October – December. Details of student's name, age, sex were recorded. Clinical findings were noted. This recorded data were entered in MS Excel and subjected to statistical analysis. Statistical analysis data were analyzed by Student s t test & chi square test.
Results: The results obtained from the study were as follows:
A total number of 483 students were screened. Prevalence of malocclusion:- Class 1 (66.3%) Class 2 (32.7%.) Class 3 (1%). Majority of the students were from the age group of 10-16 years.

Keywords: Malocclusion, School children, Western Maharashtra

Introduction
The oro-facial region is usually an area of significant concern for the individual because it draws the most attention from other people in interpersonal interactions and is primary source of vocal, physical and emotional communication. Malocclusion is any deviation from normal occlusion of teeth. The goal of the orthodontic treatment is to attain optimal occlusion within framework of function, stability and aesthetics.
As a result, patients who seek orthodontic treatment are concerned with improving their appearance and social acceptance, often more than they are with improving their oral function or health. Enhancing these aspects of quality of life is an important motive for undergoing orthodontic treatment. Orthodontic anomalies have been associated with psychosocial distress, poor periodontal condition and impaired masticatory function and so should be regarded as a health problem. Although data on orthodontic awareness and treatment needs are very scanty, malocclusion is undoubtedly a public health concern in young population. There are few studies to estimate the proportion of the population that requires orthodontic treatment in India. This study was an effort to find out the prevalence of malocclusion and orthodontic treatment need.

Material and Methods
Schools were randomly selected among western Maharashtra. Random samples of 483 children aged 10-16 years old attending these schools. School authorities and parents of sampled children were notified about purpose of the study. Clean sets of mouth mirror and probes were used to examine the samples. Mouth mirrors and probes were cleaned using 5% Savlon antiseptic solution (5ml of savlon in 95ml of water) provided by college.

Inclusion criteria
1. Age group of 10-16 years
2. No major local/systemic problems or trauma which affects the growth and development of facial structures or body.
3. No prior orthodontic or interceptive treatment carried out.

Exclusion criteria
Any child not fulfilling the stated criteria was excluded from the study. Socio-economic status

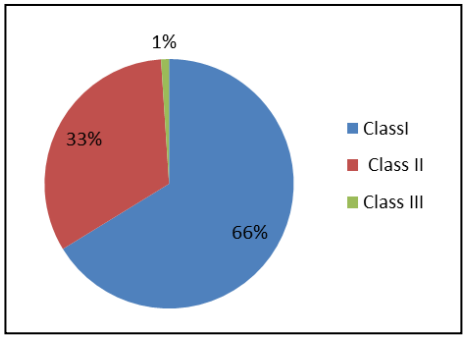
of the children.

Statistical analysis

Continuous data were summarized as mean SD while discrete (categorical) in numbers (n) & percentage (%). The data were analysed by independent Student's t test and chi square (x2) test. P value less than 0.001 ($p<0.001$) considered statistically significant. Analyses were performed on SPSS software (Windows version 16.0)

Table 1: occlusion

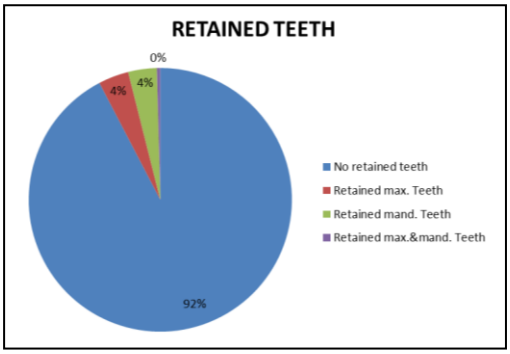
Type	No. of students	Percent
I	320	66.3
II	158	32.7
III	5	1.0
Total	483	100.0



All the students were from the age group of 10-16 years of age. Class I 320 samples (66.3%). Class II 158 samples (32.7%). Class III 5 samples (1%)

Table 2: Retained teeth

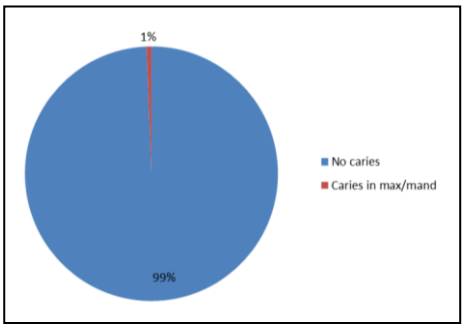
Retained	No. of students	Percent
No retained teeth	446	92.3
Retained max. Teeth	18	3.7
Retained mand. Teeth	17	3.5
Retained max. & mand. Teeth	2	.4
Total	483	100.0



The parameter was retained deciduous teeth 92% showed no retained teeth. 4% showed retained teeth in maxillary arch. 4% showed retained teeth in mandibular arch. No sample showed retained teeth in both maxillary and mandibular arch at same time. The result also showed that most the students showed maxillary deciduous teeth retained in the oral cavity.

Table 3: Caries in deciduous teeth

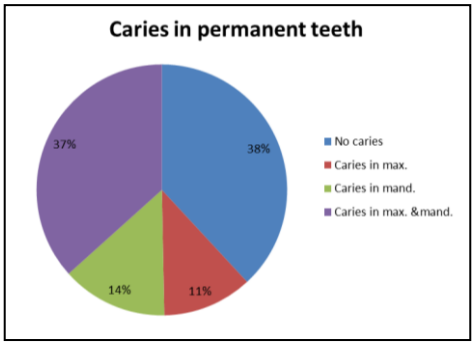
	No. of students	Percent
No caries	480	99.4
Caries in max/mand	3	.6
Total	483	100.0



Caries is one of the factor for malocclusion as stated in previous studies. 99% samples showed no caries. 1% sample showed caries in either maxillary or mandidular arch. The retained deciduous teeth showed less number of caries prevalence.

Table 4: caries in permanent teeth

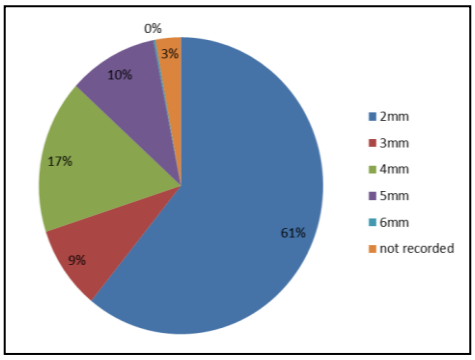
Area	No. of subjects	Percent
No caries	184	38.1
Caries in max.	56	11.6
Caries in mand.	66	13.7
Caries in max. & mand.	177	36.6
Total	483	100.0



Caries in maxillary arch 11%. Caries in mandibular arch 14%. Caries in maxillary/mandibular arch 37%. 38% showed no caries.

Table 5: overjet

Measurements in mm.	No. of subjects	Percent
2	294	60.9
3	44	9.1
4	81	16.8
5	49	10.1
6	1	.2
Total	469	97.1
Missing System	14	2.9
Total	483	100.0

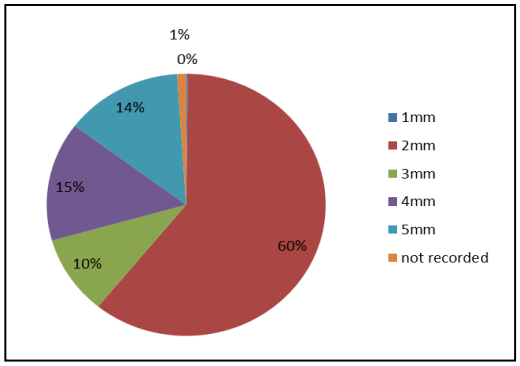


'Overjet: 2mm was seen in 61% samples. 3mm in 9%

samples. 4mm in 17% samples. 5mm in 10% samples. 6mm in 0%. Overjet was recorded in 3% cases.

Table 6: overbite

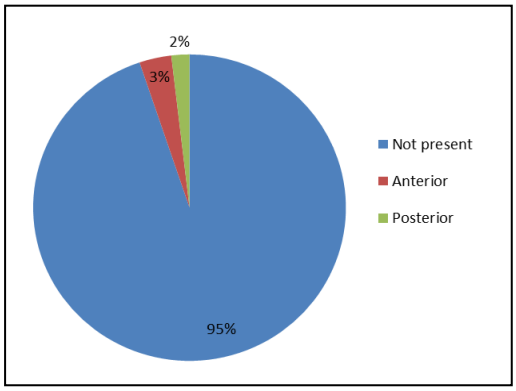
Measurements in mm.	Frequency	Percent
1	1	.2
2	293	60.7
3	47	9.7
4	71	14.7
5	66	13.7
Total	478	99.0
Missing System	5	1.0
Total	483	100.0



Overbite: 1mm seen in 0% samples. 2mm in 60% samples. 3mm in 10% samples. 4mm in 15% samples. 5 mm in 14% cases. Not recorded in 1% samples.

Table 7: open bite

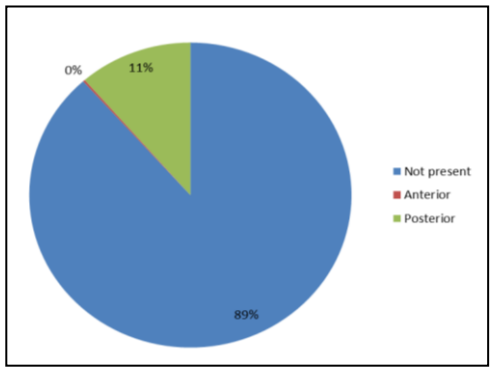
Sites	Frequency	Percent
No	458	94.8
ANT	16	3.3
POST	9	1.9
Total	483	100.0



Openbite: not present in 95% samples. Present anteriorly in 3% samples. Present posteriorly in 2% samples.

Table 8: cross bite

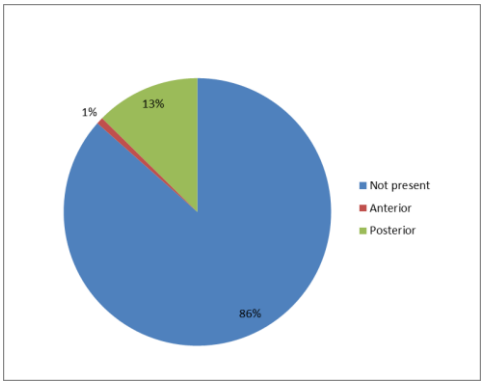
Sites	Frequency	Percent
N	427	88.4
ANT	1	.2
POST	55	11.4
Total	483	100.0



Crossbite: not present in 89% samples. Present anteriorly in 0% samples. Present posteriorly in 11% samples.

Table 9: rotation

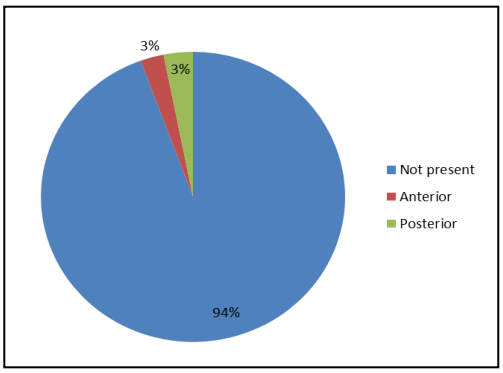
Rotation		
Sites	Frequency	Percent
No	418	86.5
ANT	4	.8
POST	61	12.6
Total	483	100.0



Rotation: not present in 86% samples. Present anteriorly 1% samples. Present posteriorly 13% samples.

Table 10: crowding

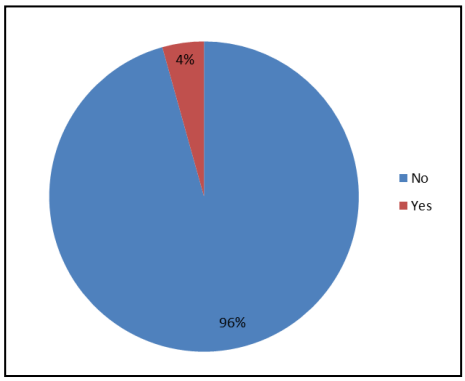
Crowding		
Sites	**Frequency**	**Percent**
N	456	94.4
ANT	12	2.5
POST	15	3.1
Total	483	100.0



Crowding: not present in 94% samples. Present anteriorly in 3% samples. Present posteriorly in 3% samples

Table 11: spacing

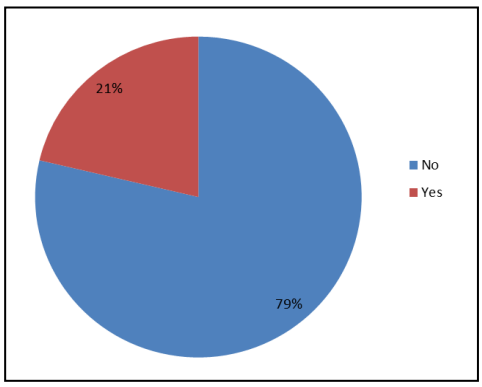
Spacing		
Spacing	**Frequency**	**Percent**
No	462	95.7
Yes	21	4.3
		.
Total	483	100.0



Spacing present in 4% samples. Spacing not present in 96% samples.

Table 12: mid-line diastema

Diastema	Frequency	Percent
No	380	78.7
Yes	103	21.3
Total	483	100.0



Midline diastema: Not present in 79% samples. Present in 21% samples.

Discussion

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's occlusion is the normal relation of the occlusal inclined planes of the teeth when the jaws are closed" [1].

Orthodontic anomalies have been associated with psychosocial distress, poor periodontal condition and impaired masticatory function and so should be regarded as health problem.

Malocclusion is not just an invariable disease state, but a continuous spectrum of occlusal variation, occurring as a myriad of combinations of permutations of a number of heterogeneous traits or symptoms each with its own wide range of severity and implications in creating a particular manifestation of occlusion [1]. An epidemiological study done by Kumar p [2] concluded malocclusion was present in 53.7% samples. And 32.8% samples needed orthodontic treatment. 55.1% samples showed no caries risk.

In the present study Class I 320 samples (66.3%). Class II 158 samples (32.7%). Class III 5 samples (1%) results were seen. As the study done by Kumar p did not concluded about the types of malocclusion present in the samples also occlusal traits except for caries were not taken in consideration.

Sogi GM (3) done a study of oral hygiene status of school children in Davangere in relation with their socioeconomic level. The study concluded that caries experience and occurrence of untreated carried lesions in secondary teeth and oral hygiene status of children are strongly correlated to socioeconomic status. Although Sogi Gm concluded that oral hygiene, untreated carried lesion and socio- economic status are important for malocclusion other factors such as retained deciduous teeth were not taken in consideration in the study done.

In the present study the socio – economic status was not much considered but the retained deciduous teeth and occlusal traits were taken into consideration.

Study done by Ajayi E [4] in Benin city of Nigeria revealed predominance of Class 1 malocclusion among children of the south – southern region of Nigeria. No statistically significant gender difference was observed for any occlusal traits evaluated in this survey. In our study Class I malocclusion was the highest seen type of malocclusion Class I 320 samples (66.3%) which was higher than the results obtained by Ajayi E. In the study done by Shivakumar KM *et al.* [17] used Dental Aesthetic Index (DAI) to check the prevalence of malocclusion in the students of Davangere city.

On this basis they concluded that 80.1% of school children had little or no malocclusion requiring no or little treatment need. 19.9% of school had malocclusion ranging from definite to handicapping malocclusion requiring elective to mandatory type of orthodontic treatment.

The study done by Prasad AR (11) in Bangalore city showed number of incidence of malocclusion (85.7%) with Class I (51.5%), Class II (4%), Class III (0.9%). Also crowded incisors were prevalently seen throughout the study which was the commonest feature associated with Class I malocclusion. No statistically significant sex differences were found among the subjects. In the present study Class I 320 samples (66.3%) Class II 158 samples (32.7%). Class III 5 samples (1%) results were seen. Class I malocclusion being the predominant. Also the results obtained were higher than the results obtained by Prasad AR study.

In the study done by Vinay Chugh *et al.* [12] grouped the samples into 5 groups being group 1 as normal occlusion, group 2 as class I malocclusion, group 3 class II div I, group 4 class II div2, group 5 class III. The class I malocclusion resulted into 57.9%. In the present study no such groups were made to assess between normal occlusion and malocclusion.

Khandelwal *et al* [14] reported class I (69.15%), class II div I (18.9%), class II div II (27.69%) class III (3.98%) in 201 males hailing from Indore.

Joshi *et al* [9] studied primary dentition in 100 children aged 3-6yrs from Gujarat and reported that spaced dentition was more common than the closed type. They found out that the amount of spacing was common in males.

The study includes various occlusal traits. These include occlusal antero-posterior relationship, overjet, overbite, openbite, spacing, crowding, midline diastema, caries in

deciduous & permanent teeth and anomalies of missing permanent teeth, impacted/ unerupted teeth and malformed teeth. Angle's classification was used as parameter to assess malocclusion. Malocclusion was assessed in buccal, sagittal, anteroposterior relationship of upper and lower arches. In the study children from age of 10-16 years were taken under consideration. There were 252(52.17%) male students & 231(47.82%) female students. The most commonly occurring malocclusion was class 1 malocclusion.

Difference

All the previous studies were done in Southern part of India [1-3, 5, 10, 11, 15, 7, 17], in an aboard country [4, 6, 16] and in northern part of India [9, 12, 13].

None of the studies were done in Western Maharashtra also only some of the studies used occlusal traits to study the prevalence of the malocclusion. All the studies done are based either on caries prevalence or depending upon the socio economic status; some were also done using the DAI index. Our study showed results that other than caries and socio economic status occlusal variants are also responsible for malocclusion. In some of the samples in our study the overjet and over bite were not recorded due to their class 3 malocclusion. As in the study done by Shivakumar *et al* [17] they did not focus on the types of malocclusion found in the samples. Also DAI used to check the malocclusion did not considered the occlusal discrepancies like buccal crossbite, openbite, central discrepancy, deepbite etc. All of which are the main basis of the present study done.

Conclusion

- Class I malocclusion is the commonest type of malocclusion present in the school children of Western Maharashtra. (66.3%)
- All the occlusal discrepancies were taken into consideration to evaluate the prevalence of the malocclusion.
- Results showed that malocclusion was highest in males (52.17%) in comparison with females (231).
- 92% cases showed no retained deciduous teeth in the oral cavity.
- 99.4% cases did not show caries in retained deciduous/present deciduous teeth.
- 60.9% samples had overjet of 2mm. 2.9% cases were not recorded due to class III malocclusion.
- 60.7% samples had overbite of 2mm. 1.0% samples not recorded due to class III malocclusion.
- 94.8% samples showed no openbite, 3.3% showed anterior while 1.9% showed posterior openbite.
- 88.4% cases showed no crossbite, 0.2% showed anterior crossbite, 11.4% showed posterior crossbite.
- 86.5% showed no rotation, 0.8% showed anterior rotation, 12.6% showed posterior rotation.
- 94.4% showed no crowding, 2.5% anterior crowding, 3.1% posterior crowding.
- 95.7% samples did not show any spacing while only 4.3% cases showed spacing.
- 78.7% samples showed no midline diastema, 21.3% samples showed diastema.
- All the results showed that malocclusion can occur in any cases irrespective of caries control and the socio economic status. There is need to make people aware about malocclusion and also about the retained deciduous teeth in oral cavity. The children should be screened at an early stage so that the rate of the malocclusion decreases. It creates an impact on the person's appearance in society at a greater extent.

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