



## Original Research Article

## Prevalence of malocclusion in school going children of age 12-15 years in Telangana

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## ABSTRACT

Health is the functional or metabolic regulation of a living body. In humans, health is an individual capability to conform and adjust to the challenges like socially, mental or physically. Mouth is the window to health of our body. Most of the nutritional deficiencies, systemic diseases, infections etc are manifested first as oral conditions. Good oral health is very important for overall wellbeing of an individual. Malocclusion is a misalignment or incorrect relation between the teeth of the two dental arches when the jaws are closed. Malocclusion is the highest public health problem in the world because of its high prevalence. Worldwide data on prevalence of malocclusion has shown that malocclusion is more prevalent in whites than in blacks, then more in females than males and more in developed countries than in developing countries, less in rural population than urban population. A definite geographical and racial variation is seen in southern and northern parts of India. In India class I malocclusion is more prevalent than class II and class III malocclusions. A prior recognition of malocclusion not only aids in intercepting its severity but it also helps in addressing the aesthetics and functional problems.

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### 1. Introduction

Health is the functional or metabolic regulation of a living body. In humans, health is an individual capability to conform and adjust to the challenges like socially, mental or physically.<sup>1</sup>

Health systems of the human body connects with oral health. Mouth is the window to health of our body. Most of the nutritional deficiencies, systemic diseases, infections etc are manifested first as oral conditions. Malocclusion is the highest public health problem in the world because of its high prevalence. It is one of the most common oral health problem after dental caries<sup>2</sup> and periodontal diseases and it is ranked 3<sup>rd</sup> among worldwide public health

diseases. The WHO included malocclusion as handicapping dentofacial anomaly because it causes disfigurement or it impedes function.<sup>3</sup> Since malocclusion has major affect on patients facial aesthetics, social and psychological consequences and bring the cause of stress for patient and their families.<sup>4</sup> Therefore, it is important to find out the prevalence of malocclusion and proper treatment to correct them. One of the major problems in studying malocclusion is the availability of suitable method for recording the occurrence and severity of orthodontic problem thus orthodontic indices are used in epidemiological studies on malocclusion. Though malocclusion is a common oral health problem its diagnosis is dependent on classification of malocclusion. A standard system of classification for malocclusion is required for planning and evaluating the orthodontic services.<sup>5</sup> One of the methods is by using

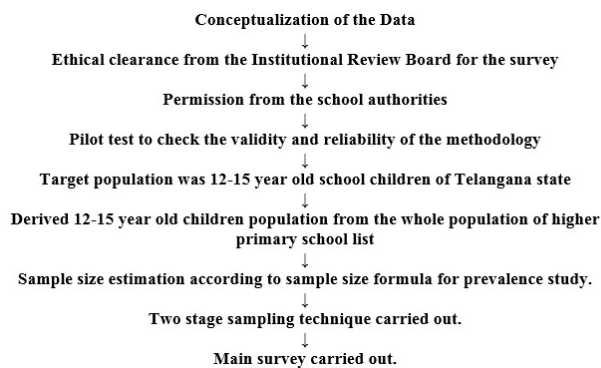
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orthodontic indices. An index has defined as a numerical value describing the relative status of a population on a graduated scale with definite upper and lower limits.<sup>6</sup>

The results of the epidemiological studies in India on malocclusion not only helps in planning orthodontic treatment but also helps in rational approach for determining the etiological factors of malocclusion.<sup>7</sup> Telangana – Suma S et al.<sup>8</sup> in his study compared the prevalence and severity of malocclusion between rural and urban children in nalgonda district. They observed that the malocclusion was more in urban (20.8%) than in rural areas (14.9%) and more in females (21.8%) than males (13.2%) the reason was socio-economical variation and dietary habits. G Anita et al.<sup>9</sup> conducted a study on school students in Telangana state, they observed 10% requires elective treatment, 3% suggesting highly desirable treatment and 0.9% indicating mandatory treatment, 86.1% suggesting no treatment. Venugopal reddy et al.<sup>10</sup> has done a study on schoolgoing children of Khammam district of age group 10-12 years. He observed that 65.9% with class I malocclusion, 9.25% has class II malocclusion and 1.37% has class III malocclusion, 15.4% has increased overjet, 0.2% has reverse overjet, 43.6% has increased overbite, 2% have Openbite, 14.01% had cross bite, 46.23% has midline diastema and 2.98% had rotated tooth.

## 2. Materials and Methods



**Fig. 1:** Flow chart of the methodology

### 2.1. Eligibility criteria

#### 2.1.1. Inclusion criteria

1. All students with chronological age group of 12-15 years
2. Students who had all permanent teeth erupted
3. Students native of Telangana and both the parents are of Telangana state origin without interstate marriages
4. Students, whose parents gave consent and children assenting to participate in the study

#### 2.1.2. Exclusion criteria

1. Students with any previous history of Interceptive (or) Orthodontic treatment or on going orthodontic treatment
2. Medically compromised students
3. Un co-operative students
4. Any physical limitations who cannot open the mouth
5. Students with extracted, missing permanent teeth, impactions and delayed eruption of permanent teeth.
6. Students with no major (or) local systemic problems and any trauma to facial structures

The basic method for the recording of malocclusion that has been jointly developed by WHO/FDI Index has been used. In this study all the districts of Telangana State has been included. The examination of the students were carried out in the medical hall of the school premises under bright day light. All the instruments used for the study are sterilized and taken to the school on the day of examination. Data were coded and entered into excel sheet. At the end of the survey, the data were scrutinized again and was handed over to the Statistician.

## 3. Results

**Table 1:** Frequency distribution of study sample

Type	Frequency	Percent
Class I (Normal)	2288	24.7
Class I (malocclusion)	5338	57.6
Class II	1386	14.9
Class III	263	2.8
Total	9275	100

The frequency distribution of the collected study sample according to the groups, In total 9275 subjects, 2288 (24.7%) were with Class I molar relationship and without any dental positive findings. 5338 (57.6%) were with Class I malocclusion, 1386 (14.9%) were with class II malocclusion and 263 (2.8%) were with Class III malocclusion (Table 1).

## 4. Discussion

Epidemiological study of disease is the first step in public health endeavours. In India as mentioned in the introduction section there is wide variation in prevalence of malocclusion<sup>11</sup> which can be attributed to lack of uniformity in collection of data, variability of methods, indices used to access the severity of malocclusion. The prevalence of malocclusion is found to vary with different population, race, origin and ethnicity.<sup>12</sup>

The overall prevalence of malocclusion of 12 to 15 years old children was found to be 89% in agreement with previous studies.<sup>13</sup> Children at this age are permanent

**Table 2:** Comparison among gender in Class I

Parameter	Female		Male		Chi sq	P value
	N	%	N	%		
Crowding	1438	59.7	1420	48.5	67.291	<0.001**
Spacing	364	15.1	346	11.8	12.538	<0.001**
Diastemma	248	10.3	242	8.3	6.595	0.010*
Overbite	1442	59.3	1420	48.4	70.361	<0.001**
Overjet	1438.0	59.7	1420	48.4	65.711	<0.001**
Openbite	196	8.1	210	7.2	1.778	0.182 NS
Crossbite	112	4.7	114	3.9	1.213	0.211 NS
Midline shift	620	25.7	598	20.4	21.385	<0.001**

\*\*-Highly significant (p<0.001), \*-Significant (p<0.05), NS- Not significant (p>0.05)

**Table 3:** Comparison among gender in Class II

Parameter	Female		Male		Chi sq	P value
	N	%	N	%		
Crowding	223	34.5	100	13.5	84.59	<0.001**
Spacing	32	4.9	42	5.7	0.371	0.542 NS
Diastemma	14	2.2	20	2.7	0.424	0.515 NS
Overbite	626	96.8	691	93.5	7.7	0.006*
Overjet	626	96.8	718	97.2	0.192	0.662 NS
Openbite	21	3.2	6	.8	10.698	0.001*
Crossbite	2	0.7	40	5.7	37.92	<0.001**
Midline shift	70	10.8	44	6.0	10.817	0.001*

\*\*-Highly significant (p<0.001), \*-Significant (p<0.05), NS- Not significant (p>0.05)

**Table 4:** Comparison among gender in Class III

Parameter	Female		Male		Chi sq	P value
	N	%	N	%		
Crowding	56	41.5	38	29.7	3.979	0.046*
Spacing	0	0.0	5	3.9	5.376	0.020*
Diastemma	2	1.5	0	0.0	1.911	0.167 NS
Overbite	0	0.0	0	0.0	-	-
Overjet	96	71.1	100	78.1	1.702	0.192 NS
Openbite	24	17.8	34	26.6	3.196	0.074 NS
Crossbite	28	20.7	36	28.1	1.946	0.163 NS
Midline shift	0	0.0	0	0.0	-	-

NS — Not significant (p>0.05), \*-Significant (p<0.05)

dentition which represents their health status. With age children grow and interact with various environments; they begin to develop differential self-concepts that are specific to different areas of life. This process begins in early childhood and accelerates during the higher primary and high school years. Self-concept represents a learned, organised response pattern that incorporates the reactions of other people; the positive and negative experiences of the child and the Childs ability to achieve his/her goals and objectives.<sup>14</sup>

It has shown that children begin to understand the ill health effects on social activities around eight years of age along with the enormous psychosocial changes associated with childhood.<sup>15</sup> The time of middle adolescence represents when social relationships may be particularly important increasing from early adolescence

and levelling off in late adolescence<sup>16,17</sup> Malocclusions with commonly occurring forms in adolescents are often presumed to be at the risk for negative self-esteem and social maladjustment.<sup>18</sup> Bullying is another social impact commonly attributed to malocclusion.<sup>19</sup>

With this background the present study was designed to assess the prevalence of malocclusion and need for orthodontic treatment in 12-15 years old Telangana school children, selecting three types of schools viz government, private, private aided schools with boys and girls. Many epidemiological studies have done previously among different populations, age groups, ethnic regions & minor communities to evaluate the prevalence of malocclusion, but there is evidence of limited documentation on newly divided regions of India after 2014 like Telangana state. Being a resident researcher of that region, this study has focused on

the population of Telangana state.

One of the major hindrances to get uniform data related to prevalence of malocclusion in India is because of variable ethnic, linguistic, communal nativities. So, it is very difficult to screen the whole population of entire country to interpret the results for application. Moreover, selecting a specific population to access the prevalence is also difficult as variations are observed among the same set of population. Hence, we incorporated 9219 school children of 12-15 years age group residing in Telangana region. The primary objective of the assessment is to determine the prevalence of malocclusion & dental anomalies to estimate the treatment needs of a population as a basis for planning of orthodontic services. Recording malocclusion is important for document purpose which serves as data for planning orthodontic service to the community. Among various types of quantitative methods,<sup>16</sup> WHO/FDI basic method is one such tool which provides a common morphology basis for studies of prevalence of malocclusion in various parts of the world as well as for studies into methods for assessing the need and demand for treatment of malocclusion. Table 1

The prevalence of Class I malocclusion with positive dental finding is found to be higher (57.6%) compared to Class II and Class III malocclusion. This can be attributed in accordance with study done by Sandhu S. S, 2012 as Class I malocclusion is the most prevalent malocclusion in India followed by Class II and Class III. The prevalence of Class II malocclusion (14.9%) is found to be higher than the average Class II malocclusion in other parts of southern India where it is around (5%) [Sadhu S. S]. The prevalence of Class III malocclusion (2.8%) is also different from regions of India like 1.4% in Rajasthan 2.3% in Bangalore 3.4% in Delhi [Das U. M]. These findings are different from Caucasians (0.8%) and Chinese (4%) population.

#### 4.1. Gender comparison in class I malocclusion

Among the male subject's overjet, overbite and crowding were found to be higher, whereas in female subjects' overbite is found to be higher in our study.

#### 4.2. Gender comparison in class II malocclusion

Among the male subject's overjet is found to be higher and in female subjects both overjet and overbite are found to be higher in our study.

#### 4.3. Gender comparison in class III malocclusion

Among both male and female subjects' overjet is found to be higher in the study.

There is no evidence for segregated comparison among male and female subjects in class I, II & III malocclusions using WHO/FDI tool in Indian population to contradict the results of the present study.

## 5. Conclusion

Observations recorded from our study as follows:

Prevalence of malocclusion using WHO/FDI index

Among all the subjects of Telangana school children of age group 12-15 years age group, 57.6% showed class I malocclusion, 24.7% showed normal class I malocclusion, 14.9% presented with class II malocclusion and 2.8% with class III malocclusion.

This study gives a baseline data of the prevalence and severity of malocclusion in 12-15 years of school children in Telangana state.

Outcome of this study is useful to the community

1. Dental professionals
2. NGO'S
3. Further research

Whereas, the limitations are,

1. It's only observational study and no intervention is done
2. Sample size is limited to apply for the whole population of Telangana
3. Subjects included are native of Telangana state origin only; other children of different states are not included in the study.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

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