

Prevalence of dental malocclusion and dental anomalies in grade I to grade V school children in rural primary school in Sakipur village Greater Noida Uttar Pradesh.

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Abstract

Aim: The objective was to assess the prevalence of malocclusion and dental anomalies among 6-13 years old school children in a rural government mid day meal school in Sakipur village of Greater Noida

Materials and Methods: A cross-sectional descriptive survey was conducted among 150 subjects aged 6-13 years old (class I to V) government primary school children who were examined by face to face interview followed by oral examination by trained dental experts using the WHO survey methodology 1997 . Descriptive statistics was calculated and *t*-test, chi square test and ANOVA was used for group comparisons.

Results: Males had a significantly higher prevalence of dental anomalies like impacted teeth , rotated teeth and peg shaped lateral than females which was seen to be statically significant.

Conclusions: The prevalence of malocclusion and orthodontic treatment needs among school children of Sakipur village, Greater Noida was seen in the study. This information can be utilized in future to meet the orthodontic treatment need among the population.

Keywords: Peg Shaped, Malocclusion, Impacted

Introduction

India as a developing country faces challenge in providing oral health care to the major part of its population in rural areas which comprises of 40 % children. The prevalence of malocclusion varies from 20%- 43% in India as quoted by literature.¹ In 1995 the National Programme for Nutrition Support for Primary Education was set up to universalize primary education as well as improve nutritional status of primary school children.²

Epidemiological data pertaining on orthodontic treatment need is valuable for dental public health programs, dental education, minimizing orthodontic treatment in future, clinical treatment, screening for treatment priority, resource planning and third party.³

An individual with malocclusion feels shy in social contacts, has lesser career opportunities and is embarrassed by their dental appearance⁴ Schools from a platform for promoting comprehensive oral health and intercepting at the right age can decrease the need of future orthodontic treatment.⁵

Materials And Methodology

A descriptive cross sectional study was conducted on 150 children (54 boys and 96 girls) among 6 - 13 year old school children studying in a rural primary school were

screened at sakipur village, Greater Noida for malocclusions, presence of dental anomalies and shape of teeth and palatal vault. Children who had undergone a past orthodontic treatment, cleft lip or cleft palate children, craniofacial anomalies, with rampant caries, with history of facial trauma and unwilling for clinical examination were excluded from the study sample. The children belonged to low socioeconomic background that were provided midday meal at school and had permanently erupted first permanent molar. All the recordings were done in the daylight and the child was made to sit in ordinary chair facing away from a direct sunlight.

The clinical examination process was visual using a mouth mirror (i.e. no examination explorer) following WHO guidelines and adequate infection control was taken into account by use of new gloves for each subject, new barrier sleeves for mouth mirror handles for each participant, new mouth mirror heads for each participant, ice cream sticks and hand disinfectant. The children were made aware of the importance of identifying minor tooth discrepancies at the right age to prevent and minimize future orthodontic problems and formal permission for conducting the oral examination was taken from the head masters of concerned school.

The orthodontic variables observed were malocclusions, anterior and posterior crossbite, pseudo class III, lower anterior crowding, supernumerary teeth, shape of teeth, palatal form, attrition of teeth, retroclination and impaction of teeth. The data of each individual was documented in survey proformas. No radiographs, study casts were used and the data was statistically analyzed for prevalence between boys and girls and comparison between different age groups. A probability value of 0.05 or less was set as the level of statistical significance.

All responses were tabulated using Microsoft-Excel 2007 Software for data analysis using Statistical Package for the

Social Sciences (SPSS Inc., Chicago, Illinois, USA) version 25.0.

Result

The sample consisted of 150 school children amongst which 36% (n=54) were boys and 64% (n=96) were girls (**Figure 1**). 93.3% of the school children were aged between 7 to 12 years, 32% of children were 9 years and 4% were 13 years old (**Table 1**). A value of $P < 0.05$ was considered as statistically significant.

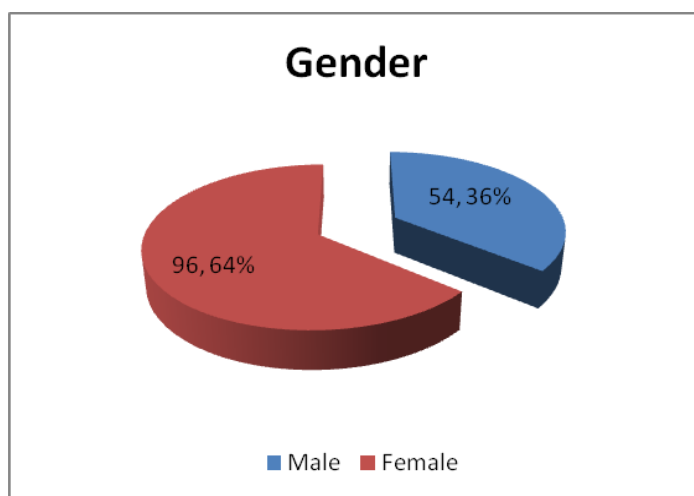


Figure 1:

Age	Frequency	Percent
6 years	6	4.0
7 years	18	12.0
8 years	28	18.7
9 years	32	21.3
10 years	16	10.7
11 years	26	17.3
12 years	20	13.3
13 years	4	2.7
Total	150	100.0

Table 1: Chi-square test

Non-significant difference

There was no significant difference in distribution of Ellis class II fractured teeth between 6-7, 8-9, 10-11 and 12-13 years age groups when compared using chi square test. 6.7% of children who showed fracture were aged between 8

to 9 years, 4.2 % were 6 to 7 years old and 2.4% were aged 10-11 years.(Table 2).

	Age groups			
Fractured teeth	6-7 years	8-9 years	10-11 years	12-13 years
Absent	23	56	41	24
	95.8%	93.3%	97.6%	100.0%
Present	1	4	1	0
	4.2%	6.7%	2.4%	0.0%
Total	24	60	42	24
	100.0%	100.0%	100.0%	100.0%
Chi-square value = 2.400, p-value = 0.494				

Table 2:

There was no significant difference in distribution of crowding of lower anteriors between 6-7, 8-9, 10-11 and 12-13 years age groups when compared using the chi-square test (Figure 2). 25.0% of children aged between 12-13 years showed crowding of lower anteriors.

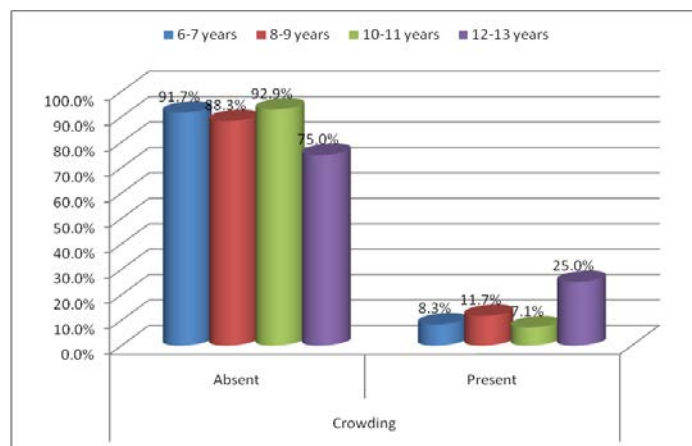


Figure 2:

There was no significant difference in distribution of diastema between 6-7, 8-9, 10-11 and 12-13 years age groups using chi square test. Diastema was more seen between 10 to 13 years (Figure 3).

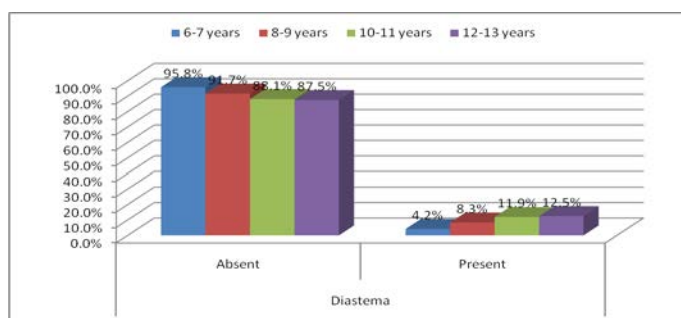


Figure 3:

	Age groups			
Retroclination	6-7 years	8-9 years	10-11 years	12-13 years
Absent	18	52	34	22
	75.0%	86.7%	81.0%	91.7%
Present	6	8	8	2
	25.0%	13.3%	19.0%	8.3%
Total	24	60	42	24
	100.0%	100.0%	100.0%	100.0%
Chi-square value = 3.104, p-value = 0.376				

Table 3:Chi-square test

#Non-significant difference

The distribution of retroclination was compared between 6-7, 8-9, 10-11 and 12-13 years age groups using the chi-square test and showed no significant difference in distribution of retroclination of upper central incisors amongst all age groups (Table 3).

	Age groups			
V shaped arch	6-7 years	8-9 years	10-11 years	12-13 years
Absent	23	54	39	24
	95.8%	90.0%	92.9%	100.0%
High Arched	0	2	0	0
	0.0%	3.3%	0.0%	0.0%
Narrow	1	3	2	0
	4.2%	5.0%	4.8%	0.0%
Wide Square	0	1	1	0

	0.0%	1.7%	2.4%	0.0%
Total	24	60	42	24
	100.0 %	100.0%	100.0 %	100.0%
Chi-square value = 5.411, p-value = 0.797				

Table 4: Chi-square test

Non-significant difference

The distribution of V shaped arch was compared between 6-7, 8-9, 10-11 and 12-13 years age groups using the chi-square test and there was no significant difference in distribution of V shaped arch amongst all age groups (**Table 4**)(**Figure 4**). High arched palate was seen at 8 to 9 years and wide square palate was seen between 8 to 10 years of age.

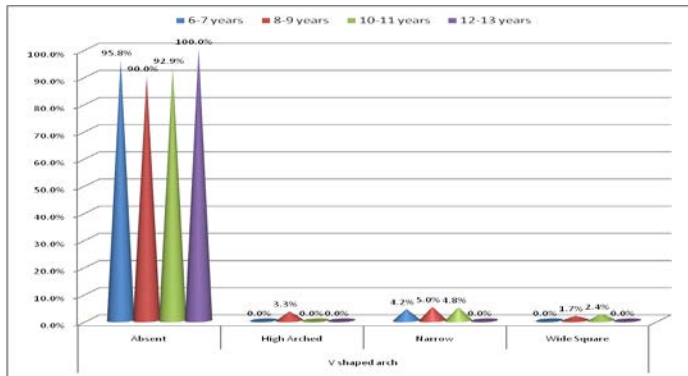


Figure 4:

	Age groups			
Peg shaped Lateral	6-7 years	8-9 years	10-11 years	12-13 years
Absent	23	59	42	22
	95.8%	98.3%	100.0%	91.7%
Present	1	1	0	2
	4.2%	1.7%	0.0%	8.3%
Total	24	60	42	24
	100.0%	100.0%	100.0%	100.0%
Chi-square value = 4.559, p-value = 0.207				

Table 5: Chi-square test

Non-significant difference

No significant difference in distribution of Peg shaped Lateral between 6-7, 8-9, 10-11 and 12-13 years age groups was seen (**Table 5**).

	Age groups			
Impaction Canine/lateral	6-7 years	8-9 years	10-11 years	12-13 years
Absent	24	60	40	22
	100.0%	100.0%	95.2%	91.7%
Present	0	0	2	2
	0.0%	0.0%	4.8%	8.3%
Total	24	60	42	24
	100.0%	100.0%	100.0%	100.0%
Chi-square value = 5.981, p-value = 0.113				

Table 6: Chi-square test

Non-significant difference

The distribution of impacted teeth was compared between 6-7, 8-9, 10-11 and 12-13 years age groups using the chi-square test and no significant difference in distribution of impacted teeth was seen (**Table 6**).

	Age groups			
Rotation	6-7 years	8-9 years	10-11 years	12-13 years
Absent	21	60	42	23
	87.5%	100.0%	100.0%	95.8%
Present	3	0	0	1
	12.5%	0.0%	0.0%	4.2%
Total	24	60	42	24
	100.0%	100.0%	100.0%	100.0%
Chi-square value = 11.943, p-value = 0.008*				

Table 7: Chi-square test

Significant difference

The distribution of rotated teeth was compared between 6-7, 8-9, 10-11 and 12-13 years age groups using the chi-square test. Rotated teeth were significantly more among 6-7 years age group (**Table 7**)(**Figure 5**).

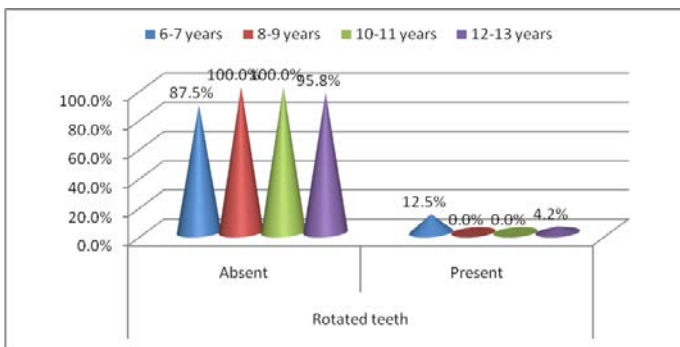


Figure 5:

The distribution of cross-bite was seen to be non significant when compared between 6-7, 8-9, 10-11 and 12-13 years age groups using the chi-square test.

Crossbite was more between 6-11 years and intercepting at the right age will stop lifelong orthodontic treatment needs (Figure 6).

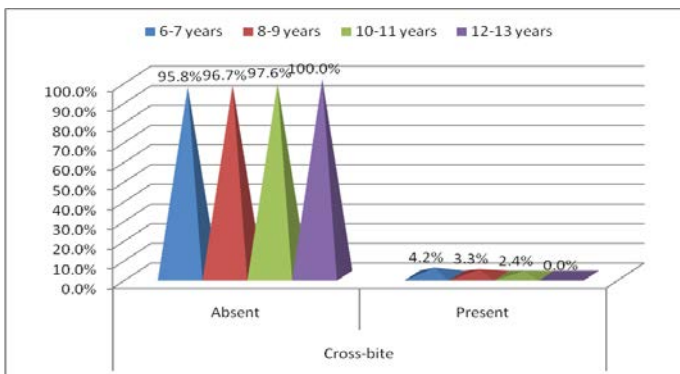


Figure 6:

	Age groups			
	6-7 years	8-9 years	10-11 years	12-13 years
Attrition				
Absent	23	58	41	24
	95.8%	96.7%	97.6%	100.0%
Present	1	2	1	0
	4.2%	3.3%	2.4%	0.0%
Total	24	60	42	24
	100.0%	100.0%	100.0%	100.0%
Chi-square value = 0.982, p-value = 0.806				

Table 8: Chi-square test

Non-significant difference

The distribution of attrited teeth was no significant when compared between 6-7, 8-9, 10-11 and 12-13 years age groups using the chi-square test (Table 8).

The distribution of supernumerary teeth was non significant when compared between 6-7, 8-9, 10-11 and 12-13 years age groups using the chi-square test (Figure 7).

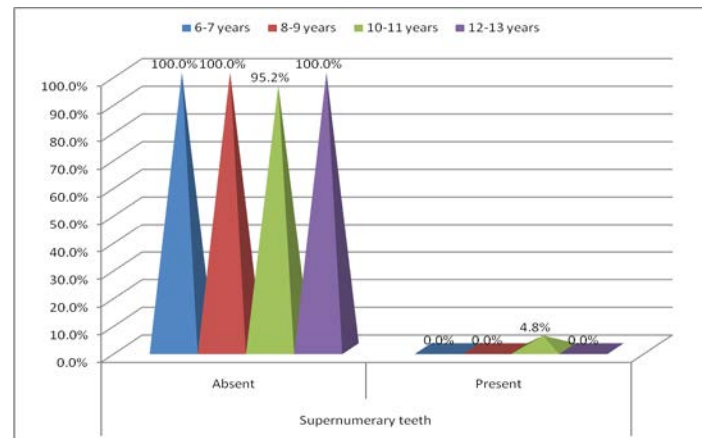


Figure 7:

The distribution of Elis class II fractured teeth was non significant when compared between males and females using the chi-square test (Figure 8).

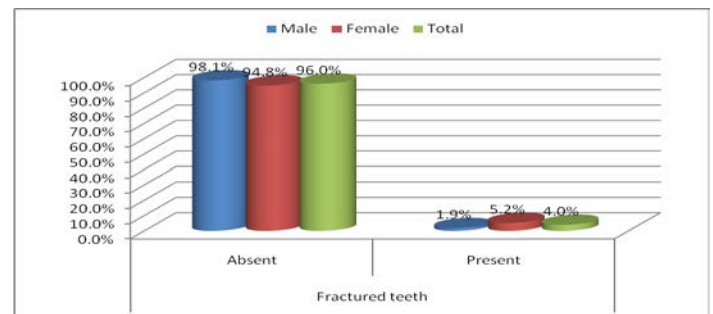


Figure 8:

Crowding	Male	Female	Total
Absent	49	83	132
	90.7%	86.5%	88.0%
Present	5	13	18
	9.3%	13.5%	12.0%
Total	54	96	150
	100.0%	100.0%	100.0%
Chi-square value = 0.600, p-value = 0.439			

Table 9: Chi-square test

Non-significant difference

Crowding was seen more in females but there was no significant difference in distribution of crowded teeth between males and females (**Table 9**).

Table:

Diastema	Male	Female	Total
Absent	48	88	136
	88.9%	91.7%	90.7%
Present	6	8	14
	11.1%	8.3%	9.3%
Total	54	96	150
	100.0%	100.0%	100.0%
Chi-square value = 0.315, p-value = 0.575			

Table 10: Chi-square test

Non-significant difference

The distribution of diastema was non significant when compared between males and females using the chi-square test (**Table 10**).

Retroclination was seen more in males when compared using the chi-square test however non significant difference in distribution of retroclination between males and females was seen (**Figure 8**).

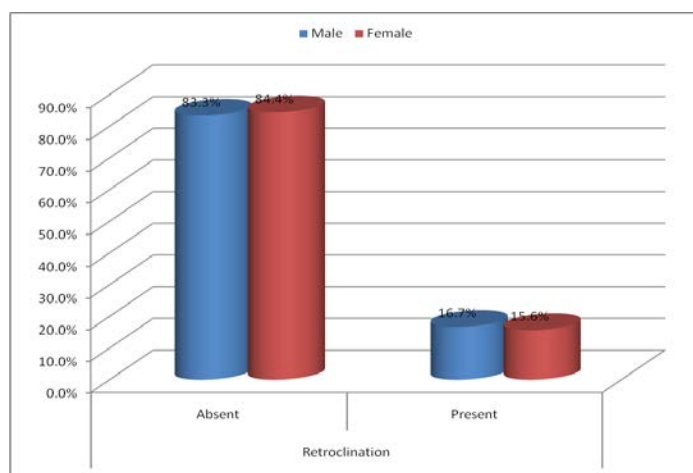


Figure 8:

V shaped arch	Male	Female	Total
Absent	51	89	140
	94.4%	92.7%	93.3%
High Arched	0	2	2
	0.0%	2.1%	1.3%
Narrow	2	4	6
	3.7%	4.2%	4.0%
Wide Square	1	1	2
	1.9%	1.0%	1.3%
Total	54	96	150
	100.0%	100.0%	100.0%
Chi-square value = 1.325, p-value = 0.723			

Table 11: Chi-square test

Non-significant difference

The distribution of V-shaped arch was non significant when compared between males and females using the chi-square test (**Table 11**). Narrow arch was more in females than males.

Peg shaped Lateral	Male	Female	Total
Absent	50	96	146
	92.6%	100.0%	97.3%
Present	4	0	4
	7.4%	0.0%	2.7%
Total	54	96	150
	100.0%	100.0%	100.0%
Chi-square value = 7.306, p-value = 0.007*			

Table 12: Chi-square test

*** Significant difference**

The distribution of Peg shaped Lateral was compared between males and females using the chi-square test. Peg

shaped lateral was significantly more among males compared to females (Table 12)(Figure 9).

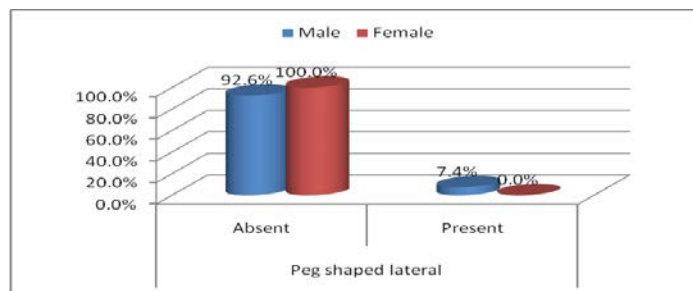


Figure 9:

Impaction	Male	Female	Total
Absent	50	96	146
	92.6%	100.0%	97.3%
Present	4	0	4
	7.4%	0.0%	2.7%
Total	54	96	150
	100.0%	100.0%	100.0%

Chi-square value = 7.306, p-value = 0.007*

Table 13: Chi-square test

* Significant difference

The distribution of impacted canine and laterals teeth was compared between males and females using the chi-square test. Impacted teeth were significantly more among males compared to females (Table 13)(Figure 10).

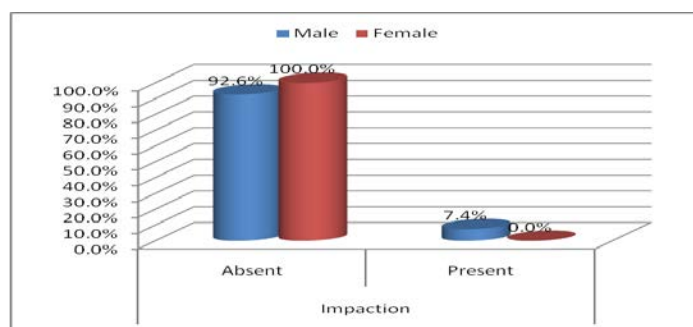


Figure 10:

Rotation	Male	Female	Total
Absent	50	96	146
	92.6%	100.0%	97.3%
Present	4	0	4

	7.4%	0.0%	2.7%
Total	54	96	150
	100.0%	100.0%	100.0%

Chi-square value = 7.306, p-value = 0.007*

Table 14: Chi-square test

* Significant difference

The distribution of rotated teeth was compared between males and females using the chi-square test. Rotated teeth was significantly more among males compared to females.

Cross-bite	Male	Female	Total
Absent	53	93	146
	98.1%	96.9%	97.3%
Present	1	3	4
	1.9%	3.1%	2.7%
Total	54	96	150
	100.0%	100.0%	100.0%

Chi-square value = 0.216, p-value = 0.642

Table 15: Chi-square test

Non-significant difference

The distribution of Cross-bite was non significant when compared between males and females using the chi-square test.

Attrition	Male	Female	Total
Absent	54	92	146
	100.0%	95.8%	97.3%
Present	0	4	4
	0.0%	4.2%	2.7%
Total	54	96	150
	100.0%	100.0%	100.0%

Chi-square value = 2.312, p-value = 0.128

Table 16: Chi-square test

Non-significant difference

The distribution of Attrition compared between males and females using the chi-square test was non significant though it was seen more in females (Table 16)

Supernumerary teeth	Male	Female	Total
Absent	53	95	148
	98.1%	99.0%	98.7%
Present	1	1	2
	1.9%	1.0%	1.3%
Total	54	96	150
	100.0%	100.0%	100.0%
Chi-square value = 0.172, p-value = 0.678			

Table 17: Chi-square test

Non-significant difference

The distribution of Supernumerary teeth was compared between males and females using the chi-square test was non significant (Table 17).

Figure 11: shows comparison between males and females on the basis of orthodontic parameters.

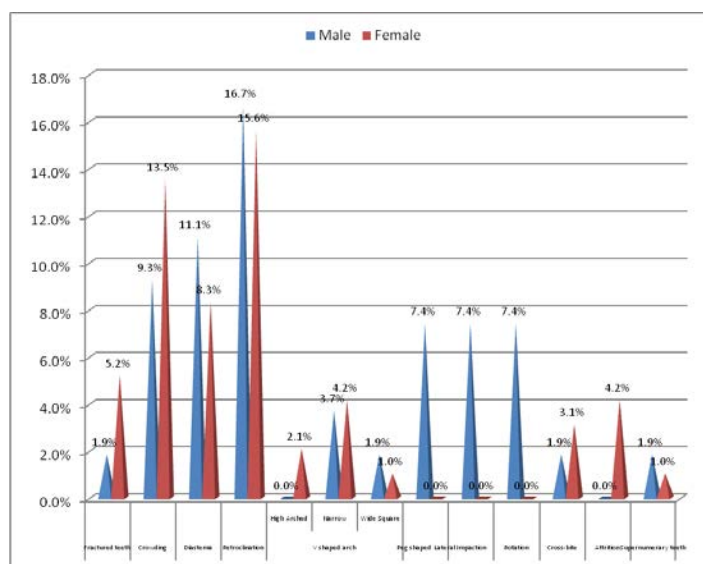


Figure 11:

Discussion

Public Health Dental Disease Priorities features malocclusion as the third highest in prevalence of dental diseases.⁵ Malocclusion has shown to affect oral health, increase prevalence of dental caries and can cause temporomandibular joint disorders.⁶ A survey proforma was prepared from WHO Oral Health Assessment Form.

The prevalence of malocclusion in India ranges from 20% to 43% as reported by literature.⁷

7% of children are born with dental anomaly of the orofacial system and most commonly seen anomaly are supernumerary teeth, missing teeth, fused teeth and peg lateral incisors.⁸ Impactions (39.2%) were the most common anomaly seen in maxilla of children.^{8,9} In our study also impactions of teeth in maxilla was significantly seen more in males than females.

The presence of crowding in the dental arches is due to dentoalveolar discrepancies and tooth size and jaw size discrepancies. The high prevalence of crowding is also because of caries and molar extraction causing migration of the first permanent molar, inclinations and rotations.¹⁰

Anterior cross bite needs early interceptive treatment to enhance a favourable growth of entire maxillofacial complex and was seen in 2.7% of our cases which are lower than 3.2 % as noted by Onyeaso among Nigerians and 6.5 % as noted by Muasya MK et al in Nairobi.^{11,12,13}

In our study males showed a higher prevalence of dental anomaly like impacted teeth, rotated teeth and peg shaped lateral which emphasizes on higher demand for orthodontic treatment among males than females. The reason might be that male craniofacial growth starts later and does not reach maximum at the age range of the study population.

A systematic orthodontic examination carried out in primary rural school will help in planning and timing of treatment of malocclusion and the use of preventive and interceptive measures to minimize the severity of lesion will help in planning purpose.¹⁴

The results of the epidemiological studies on malocclusion help in determining the etiological factors too.¹⁵ To meet the orthodontic treatment needs, the Public Health Dentistry and pediatric dentistry department of various dental colleges should take imperative steps in

implementation of a comprehensive dental health care inculcating the orthodontic services in the current public health policies to fill in the loopholes.^{16,17}

Conclusion

The prevalence of malocclusion and orthodontic treatment needs among rural school children in Sakipur village of Greater Noida, Uttar Pradesh was seen. The prevalence of dental anomalies was greater among males than females. So school based programmes and orthodontic evaluation can be beneficial intervention done at the right age to minimize the need of expensive and unaffordable treatments by trained orthodontic specialists.

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