

## Malocclusion Pattern In Orthodontic Patients

### Abstract

**Background:** The human face holds an absorbing and consuming interest the world over. The study of orthodontia is indissolubly connected with the human face, as the mouth is the most potent factor in making or marring the beauty and character of the face. One of the primary goals of orthodontic treatment is to attain and preserve optimal facial attractiveness.

**Aims and Objectives:** In the present study attempt was made to check the prevalence of various malocclusion characteristics in the orthodontic patient population. The aim of the study was to provide quantitative information regarding the pattern of dentofacial characteristics in orthodontic patients and to find frequencies of Angles classes and other dentofacial characteristics in orthodontic patients along with gender differences if any.

**Material and Method:** Pre-treatment orthodontic records of 102 patients, 44 males and 58 females, were obtained and used for study. The following dentofacial characteristics were recorded: chief complaint, Angle's malocclusion, Irregularity index i.e. arch length discrepancy; crowding and spacing, overjet, overbite, diastema, crossbite, cephalometric skeletal analysis. Data collected were pooled to determine frequencies and cross-tabulation of dentofacial characteristics with Angle's malocclusion classes.

**Statistical Analysis:** The statistical analysis was carried out using Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, version 15.0 for Windows).

**Results:** Results showed that there is no gender difference in the number of male and female patients seeking orthodontic treatment. Dentofacial characteristics concerned with esthetics i.e. forwardly placed teeth and malpositioned teeth are of prime importance to the patients and there are no prevalent gender trends in the different characteristics of malocclusion.

### Key Words

Dentofacial characteristics, esthetics, malocclusion.

### Introduction

The malocclusion can be defined as an occlusion in which there is mal-relationship between the arches in any of the planes or there are anomalies in tooth position beyond normal limits. The etiology of malocclusion can be genetic or environmental and/ or a combination of both along with various local factors such as oral habits, tooth anomalies etc. The malocclusion has been shown to affect oral health, increase prevalence of caries and can cause temporomandibular disorders. The benefits of orthodontic treatment are prevention of tissue damage, improvement in aesthetics and physical function. The uptake of orthodontic treatment is influenced by the desire to look attractive, self-esteem and self-perception of dental appearance. Satisfaction with one's appearance is related to social functioning. As malocclusion is often conspicuous, it might lead to adverse social reactions and a deficient self-concept. Concern for and a desire to improve one's appearance is a significant motive for most people who seek orthodontic treatment. People equate good facial and dental appearance with

many social aspects of life. Rather than physical function malocclusion has greater impact on individual in terms of quality of life and social limitations. In the present study attempt was made to check the prevalence of various malocclusion characteristics in the orthodontic patient population. This can give an indication about which dental characteristics are perceived by the patients and the parents as being the most unpleasant so that they have to opt for orthodontic treatment.

**Aims and Objectives :** The aim of the study was to provide quantitative information regarding the pattern of dentofacial characteristics in orthodontic patients and to find frequencies of Angles classes and other dentofacial characteristics in orthodontic patients along with gender differences if any.

**Materials and Method :** This cross-sectional study included orthodontic patients who visited the department of Orthodontics and Dentofacial Orthopaedics, Luxmi Bai Institute of Dental Sciences and Hospital, Patiala. Pre-treatment orthodontic records of 102

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patients, 44 males (mean age 25.9 years) and 58 females (mean age 21.3 years), were obtained and used for study. The inclusion criteria for the sample included those with complete pre-treatment records and undergoing orthodontic treatment; while those who came for consultation only or had previously undergone orthodontic treatment were not included in the study. Data collection was based on written case records, dental casts and cephalometric radiographs. The following dentofacial characteristics were recorded: chief complaint, Angle's malocclusion, Irregularity index i.e. arch length discrepancy crowding and spacing (0-1 Ideal, -3 mild, 4-6 moderate, 7-10 severe, > 10 extreme) overjet (1-2 Ideal, 3-4 mild, 5-6 moderate, 7-10 severe, > 10 extreme, reverse overjet), overbite (0-2 Ideal, 3-4 moderate, 5-7 severe, > extreme, open bite), diastema > 2mm, crossbite, cephalometric skeletal analysis ( ANB- skeletal Class I: 0-4\*, skeletal Class II :> 4, skeletal Class III :< 0). Data collected were pooled to determine frequencies and cross-tabulation of dentofacial characteristics with Angle's malocclusion classes.

**Statistical Analysis :** The statistical

analysis was carried out using Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, version 15.0 for Windows). Our data was of qualitative or categorical variables which were described as frequencies and proportions. Proportions were compared using Chi square or Fisher's exact test whichever was applicable. All statistical tests were two-sided and performed at a significance level of  $\alpha=.05$ .

**Results :** **Table 1** gives the distribution of subjects on the basis of gender and malocclusion classes. Within each malocclusion class there was no significant difference between the numbers of male and female patients as shown by the p-value of 0.76, when Chi-square test was applied. **Table 2** gives the number of patients who came with a particular chief complaint. These subjects were again divided on gender basis. Chi-square test was applied to check for any specific trend in chief complaints in males and females and the difference between the two was statistically insignificant as shown by the p-value. **Table 3** shows the distribution of malocclusion classes based on maxillomandibular skeletal relation. Chi-square test shows the skeletal classes were related to the angles classes significantly. **Table 4** gives the distribution of various dental malocclusion characteristics in both male and female subject. Any prevalent trends on gender basis for any dentofacial characteristics were checked. It was demonstrated that there was no statistically significant variation between males and females for crowding as shown by a p value of 0.3 for maxillary crowding and 0.7 for mandibular crowding. Similarly there was no statistically significant difference in the prevalence of maxillary and mandibular spacing between males and females as shown by p value of 0.7 and 0.2 respectively. A p value of 0.7 and 0.9 for overjet and overbite again show no prevalent gender differences.

**Discussion :** This study shows the distribution of subjects on the basis of gender and malocclusion classes.

ANGLE'S CLASSIFICATION	TOTAL NUMBER = 102 (no%)	Males Total No. = 44	Females Total No. = 58
CLASS I	49 (48.03%)	18	31
CLASS II	53 (51.9%)	21	32
CLASS III	0 (0%)	0	0
Chi Sq = .09 p- val = .7642			

distribution of various malocclusion characteristics in the orthodontic patients coming to the department. The results show that there is comparable number of male and female patients seeking orthodontic treatment. Similar results were reported by Oluranti OD, Ifeoma LU (2009)<sup>[1]</sup> in their study that showed 45.5% males and 54.5% females attending the orthodontic unit of the hospital. This study evaluated the traits which were of greater concern to the patients. The dentofacial characteristics which were of prime importance to the

patients were recorded. This study demonstrates that most of the patients came with the chief complaint of forwardly placed teeth. This is followed by the chief complaint of malpositioned teeth. This was followed by a chief complaint of increased spacing, diastema, high placed canines, crossbites and rotations. Similar results were reported in study by Gul E Erum(2008)<sup>[2]</sup> in which majority of patients reported with a chief complaint of 'upper front teeth forward' and 'malaligned teeth'. The study further demonstrates that there

Table 2: Distribution of patients on the basis of chief complaint.

CHIEF COMPLAINT	NUMBER (TOTAL = 102)	Males (Total =44)	Females (Total= 58)	Chi sq	P - val
MALPOSITIONED TEETH	26 (25.49%)	11	15	.01	.9203
FORWARDLY PLACED TEETH	35 (34.31%)	16	19	.14	.7082
CROSSBITE	7 (6.86%)	2	5		.4689
DIASTEMA	10 (9.8%)	4	6		1
SPACING	12 (11.76%)	5	7	.04	.8414
ROTATION	1 (0.09%)	1	0		.4314
OPEN BITE	1 (0.09%)	1	0		.4314

Table 3: Distribution of malocclusion classes based on maxillomandibular relation.

SKELETAL CLASSES	ANGLES CLASS I (no. %)	ANGLES CLASS II (no. %)	ANGLES CLASS III (no. %)	TOTAL
SKELETAL CLASS I	29 (28.43%)	15 (14.7%)	0	44 (43.13%)
SKELETAL CLASS II	22 (21.56%)	34 (33.33%)	0	56 (54.90%)
SKELETAL CLASS III	2 (1.96%)	0	0	2 (1.96%)
Chi Sq. = 8.88, p- val. = .0118				

Table4 : Distribution of various dental malocclusal characteristics in both male and female subjects.

DENTOFACIAL CHARACTERISTICS		ANGLE'S CLASS I	ANGLE'S CLASS II	TOTAL	Males	Females	
CROWDING	0-1	1	0	1 (0%)	1	0	
	NORMAL	MAXILLARY	4	6	10 (9.8%)	3	7
		MANDIBULAR	8	5	13 (11.74%)	6	7
	2-3	5	7	12 (11.76%)	6	6	
	4-6	MAXILLARY	7	7	14 (13.72%)	5	9
		MANDIBULAR	7	8	15 (14.70%)	5	10
	> 7	5	9	14 (13.72%)	3	11	
	SEVERE	MAXILLARY	7	9	16 (15.6%)	6	10
MANDIBULAR		7	9	16 (15.6%)	6	10	
SPACING	0-1	0	1	1 (0%)	0	1	
	NORMAL	MAXILLARY	7	8	15 (14.7%)	8	7
		MANDIBULAR	4	2	6 (5.88%)	3	3
	2-3	4	2	6 (5.88%)	5	1	
	MILD	MAXILLARY	7	12	19 (18.62%)	9	10
		MANDIBULAR	1	2	3 (2.94%)	1	2
	4-6	13	10	23 (22.54%)	13	10	
	> 7	6	6	12 (11.76%)	4	8	
SEVERE	MAXILLARY	15	1	21 (20.58%)	8	13	
	MANDIBULAR	17	6	23 (22.54%)	10	13	
	MAXILLARY	7	5	12 (11.76%)	5	7	
	MANDIBULAR	4	31	35 (34.3%)	18	17	
OVERJET	0-2 NORMAL	19	2	21 (20.58%)	9	12	
	3-4 MILD	18	10	28 (27.45%)	12	16	
	5-6 MODERATE	5	28	33 (32.35%)	14	19	
	>7 SEVERE	0	11	11 (10.78%)	4	7	
OVERBITE	5	2	7 (6.86%)	2	5		
CROSSBITE							

is no statistically significant difference in the number of patients coming with Class I and Class II malocclusions, whereas the number of patients reporting with Class III malocclusion is very less. The research of Proffit et al for untreated White American subjects between 8 and 50 years showed incidence of Class I malocclusions as 52.2%, 42.4% as Class II and less than 5% as Class III malocclusions.<sup>[2]</sup> In the hospital based study by Gul E Erum(2008), the frequency of Class I, Class II and Class III malocclusion was found to be 18.6%, 70.5% and 10.9% respectively. Another study on the pattern of malocclusion in Africa by Onyeaso CO, Aderinokun GA, Arowojolu MO(2002)<sup>[3]</sup> showed the molar relationship among those as: Class I 76.5%, Class II 15.5% and Class III 8.0%. A study on rural children by Guaba K, Ashima G, Tewari A, Utreja A (1998) found 29.2% subjects to have malocclusion; among them Class I malocclusion was found to be 14.4%, Class II 13.5% and Class III 1.35% of the whole sample. Willems G (2001)<sup>[5]</sup> showed the prevalence of Angle Class I, Class II div. 1, Class II div. 2 and Class III malocclusions as, respectively, 31%, 52%, 11% and 6%. Oluranti OD, Ifeoma LU (2009)<sup>[1]</sup> found Class I molar relationship was predominantly occurring seen in 76.7% of patients. The results of the study showed 20.58 percent of patients to have a normal overjet, 22.54 to have mild overjet, 11.76 percent had moderate overjet while 34.3 percent had severe overjet. For overjet, there was greater number of patients with normal or mild overjet in Class I malocclusion. There was greater number of patients with moderate and severe overjet in Class II category. Study by Gul E Erum(2008)<sup>[2]</sup> showed normal overjet in 16 percent, mild in 28 percent, moderate in 20 percent and severe in 30 percent. Onyeaso CO, Aderinokun GA, Arowojolu MO(2002)<sup>[3]</sup> demonstrated increased overjet in 16.2% of the patients, reduced overjet in 0.7% while 2.1% had reversed overjet. Oluranti OD, Ifeoma LU (2009)<sup>[1]</sup> in their study reported marked increase in overjet in 32.2%. The results of study by E. Tausche, O. Luck, and W. Harzer (2004)<sup>[6]</sup> showed that overjet (more than 3.5 mm) affected 37.5% of the subjects. This study showed that 20.58 percent had normal overbite, 27.45 percent had mild overbite, 32.35 percent had moderate overbite and 10.78 presented with severe

overbite. Study by Gul E Erum(2008)<sup>[2]</sup> showed 25.6 percent as normal, 48.7 percent as mild, 17.9 percent as moderate and 3.8 percent as severe overbite. Onyeaso CO, Aderinokun GA, Arowojolu MO(2002)<sup>[3]</sup> reported increased overbite (3.8%), reduced overbite (1.4%); anterior open bite (5.2%). Oluranti OD, Ifeoma LU(2009)<sup>[1]</sup> reported Overbite discrepancies in 26.2% of patients with deep bite and 11.2% of patients with anterior open bite. E. Tausche, O. Luck, and W. Harzer (2004)<sup>[6]</sup> showed that deep overbite affected 46.2%.

This study demonstrates that a total of 39.18 percent patients had maxillary crowding and 51.86 percent had mandibular crowding. The results showed that almost the same number of patient came for treatment for mild, moderate and severe crowding. This can be explained on the basis that even moderate crowding is associated with malposed front teeth which are esthetically unacceptable to the patient. Oluranti OD, Ifeoma LU (2009)<sup>[1]</sup> Anterior segment crowding was recorded in 38.7% and 43.2% of the patients for the upper and lower arch respectively. Onyeaso CO, Aderinokun GA, Arowojolu MO (2002)<sup>[3]</sup> Crowding, spacing and retained primary incisors constituted 29.7%, 1.4% and 40.1%, respectively. E. Tausche, O. Luck, and W. Harzer (2004)<sup>[6]</sup> Anterior crowding greater than 3.0 mm was recorded in 14.3% of the subjects in the mandible and in 12.0% in the maxilla. The study demonstrates that a total of 47.04 percent patient presented with maxillary spacing while 35.28 percent patients presented with mandibular spacing. However the number of patients increases as the severity of spacing increases i.e. mild, moderate, and severe.

Chi square test applied to check any prevalent gender trend in the different characteristics of malocclusion demonstrated no statistically significant difference. Similar results were reported by Gul E Erum (2008)<sup>[2]</sup> who also reported no significant differences in distribution of Angle's classes and dentofacial characteristics between males and females. In study by Willems G (2001)<sup>[5]</sup> no significant difference in the prevalence of the Angle classes between the sexes was found.

This result is in contrast to the results of studies by that showed higher tendency for class II and III in males as compared

to females. Onyeaso CO, Aderinokun GA, Arowojolu MO(2002)<sup>[3]</sup> reported males to have significantly more of classes II and III molar relationships than females (P < 0.05). Occurrence of retained primary teeth as well as overjet deviation from normal was significantly higher in females (P < 0.05). No significant sex differences were found in the other occlusal disorders (P > 0.05).

**Conclusions :** There is no gender difference in the number of male and female patients seeking orthodontic treatment.

Dentofacial characteristics concerned with esthetics i.e. forwardly placed teeth and malpositioned teeth are of prime importance to the patients while seeking orthodontic treatment. No statistically significant difference in the number of patients coming with Class I and Class II malocclusions, whereas the number of patients reporting with Class III malocclusion is very less.

No prevalent gender trend in the different characteristics of malocclusion.

## References

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