

Original Research

Determination of Malocclusion and Orthodontic Treatment Need in Patients- A Clinical Study

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ABSTRACT:

Background: Prevalence of malocclusion and the need of orthodontic treatment are deemed important and included in national health surveys in various countries. The present study was conducted to determine malocclusion and orthodontic treatment need in population.

Materials & Methods: The present study was conducted on 525 patients of age ranged 12-30 years of both genders. Malocclusion such as Angle's classification, over jet, over bite, open bite, crowding, spacing and cross bite were recorded in a performa. Dental Health Component (DHC) of IOTN index was recorded for various malocclusions. Three categories of treatment need such as grade 1- no need, grade 2 (no or little need of treatment), grade 3- borderline need, grade 4- definite and grade 5- extreme need. **Results:** Out of 525 patients, males were 315 and females were 210. 75 patients were normal, class I malocclusion in 210, class II in 150 and class III in 90. Overjet was excessive in 220 and reduced in 45. Overbite was excessive in 200 and reduced in 35. Open bite was present in 195. The difference was significant ($P < 0.05$). DHC grade 1 & 2 was seen in 395, grade 3 in 120 and grade 4 and 5 in 60. The difference was significant ($P < 0.05$). **Conclusion:** The most commonly class I malocclusion. DHC grade 1 and 2 was seen in maximum number of patients. Dental Health Components (DHC) of index of Orthodontic Treatment Need (IOTN) is useful in determining malocclusion.

Key words: Malocclusion, Index of Orthodontic Treatment Need, Class I.

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INTRODUCTION

Prevalence of malocclusion and the need of orthodontic treatment are deemed important and included in national health surveys in various countries. The major etiology of malocclusion is attributed to genetic, racial and environmental factors. Malocclusion has been shown to affect the person psychologically, reducing the self-esteem and resulting in fewer opportunities in life. Various methods are used to assess orthodontic treatment need; while Index of Orthodontic Treatment Need (IOTN) is most commonly used to assess occlusal traits.¹

Malocclusion is not a disease, but a developmental condition representing biological diversity. It is basically the clinically significant variations from normal morphology and range of growth.

Malocclusion may be the result of a combination of minor variations from the normal and these combinations add on to produce a clinical problem.² The factors responsible for malocclusion include genetic and environmental factors, or a combination of both along with various local factors such as adverse or deleterious oral habits and anomalies in number, shape and developmental position of teeth and dentition. Malocclusion may affect periodontal health, causes dental caries and temporomandibular joint problems.³

The Index of Orthodontic Treatment Need (IOTN), which was developed to rank malocclusion on the basis of the significance of various occlusal traits for dental health and aesthetic components. The index incorporates a dental health component (DHC) based on the recommendations of

the Swedish medical board and an aesthetic component.⁴ The present study was conducted to determine malocclusion and orthodontic treatment need in population.

MATERIALS & METHODS

The present study was conducted in the Department of Orthodontics, Adesh Institute of Dental Sciences & Research, Bathinda, Punjab, India. It comprised of 525 patients of age ranged 12-30 years of both genders. Patients who had any kind of malocclusion were considered. Patients undergoing fixed orthodontic treatment, history of extractions, systemic health problems and developmental anomalies were excluded. The study was approved from institutional ethical committee. All participants were

informed regarding the study and written consent was obtained.

Data related to participants such as name, age, gender etc. was recorded. A thorough oral examination was done by dental surgeon using mirror, probe and twizzer. Malocclusion such as Angle’s classification, over jet, over bite, open bite, crowding, spacing and cross bite were recorded in a performa. Dental Health Component (DHC) of IOTN index was recorded for various malocclusions. Three categories of treatment need such as grade 1- no need, grade 2 (no or little need of treatment), grade 3- borderline need, grade 4- definite and grade 5- extreme need. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of participants

	Total- 525	
Gender	Males	Females
Number	315	210

Table I shows that out of 525 patients, males were 315 and females were 210.

Table II Distribution of different occlusal traits

Parameters	Class	Number	P value
Angle class	Normal	75	0.01
	Class I	210	
	Class II	150	
	Class III	90	
Overjet	Normal	310	0.04
	Excessive	220	
	Reduced	45	
Overbite	Normal	340	0.02
	Excessive	200	
	Reduced	35	
Open bite	Present	195	0.05
	Absent	380	

Table II shows that 75 patients were normal, class I malocclusion in 210, class II in 150 and class III in 90. Overjet was excessive in 220 and reduced in 45. Overbite was excessive in 200 and reduced in 35. Open bite was present in 195. The difference was significant (P< 0.05).

Table III Dental Health Component grades of IOTN

DHC grade	Number	P value
Grade 1 & 2	395	0.05
Grade 3	120	
Grade 4 & 5	60	

Table III, graph I shows that DHC grade 1 & 2 was seen in 395, grade 3 in 120 and grade 4 and 5 in 60. The difference was significant (P< 0.05).

DISCUSSION

The factors responsible for malocclusion include genetic and environmental factors, or a combination of both along with various local factors such as adverse or deleterious oral habits and anomalies in number, shape and developmental position of teeth and dentition. Malocclusion may affect periodontal health, causes dental caries and temporomandibular joint problems.⁵

The IOTN has a DHC component which as with all normative indices is able to transform along with developmental changes over time hence is quite reliable. In addition, the IOTN has been tried and tested with the example of the National Health Service in the United Kingdom routinely using it to identify individuals whose traits of malocclusion are deemed appropriate for the expenditure of resources that is orthodontic treatment.⁶ The present study was conducted to determine malocclusion and orthodontic treatment need in population.

In this study, out of 525 patients, males were 315 and females were 210. 75 patients were normal, class I malocclusion in 210, class II in 150 and class III in 90. Overjet was excessive in 220 and reduced in 45. Overbite was excessive in 200 and reduced in 35. Open bite was present in 195. The difference was significant ($P < 0.05$).

Klages et al⁷ conducted a study to assess the prevalence of malocclusion and orthodontic treatment need amongst patients. A cross-sectional study based on WHO-Oral Health Survey Basic Methods using Community Periodontal Index (CPI) probe and mouth mirror was conducted. The malocclusion based on Angle's classification, overjet, overbite, open bite, crowding, spacing and cross bites were recorded. Dental Health Components (DHC) of Index of Orthodontic Treatment Need (IOTN) was recorded. The prevalence of normal occlusion was 5.8%, Angle's Class I malocclusion was 67.9%, Class II was 19.5% and Class III was 6.8%. Crowding (51.07%) was more common malocclusion trait than spacing (24.46%). There were no significant differences in distribution of various occlusal traits between male and female subjects. Orthodontic treatment need based on DHC showed: 19.40% were in definite/extreme need of treatment (Grade 4/5), 21.93% had borderline need (Grade 3) and 58.67% had no/ little need of treatment (Grade 1/2).

We found that DHC grade 1 & 2 was seen in 395, grade 3 in 120 and grade 4 and 5 in 60. The difference was significant ($P < 0.05$). Evans et al⁸ evaluated the severity of the malocclusion and orthodontic treatment needs in 16–24-year-old Indian young adults. A cross-sectional study was conducted among 660 subjects (352 males; 308 females) residing in rural areas. Clinical examinations were conducted using the dental esthetic index (DAI) to evaluate the extent of orthodontic treatment needs among the population. The mean DAI score of the sample was found to be 31.08 ± 7.98 . No gender-wise differences were found.

Statistically significant differences were observed between the age groups. Diastema between males and females was the only component where differences were found to be statistically significant. Around 45.15% of the total sample had a highly desirable and mandatory orthodontic treatment need. Gender did not influence treatment need whereas age group was found to influence it.

Sharma et al⁹ showed that Angle's Class III malocclusion was more prevalent than class II amongst Tibetan ethnic group in the same region; which were 9.40% and 5.10% respectively. This could be due to racial variation in occlusal traits. Similarly, increased prevalence of Angle's Class III malocclusion was also seen in Saudi Arabia population (15.5%). Baral P et al¹⁰ found that crowding was more common occlusal trait than spacing which was 51.07% and 24.46% respectively. This study showed midline diastema in 13.9%, anterior cross bite in 10.3% and posterior cross bite in 6.8%. The differences could be due to ethnic diversity and study design.

CONCLUSION

Authors found that most commonly class I malocclusion. DHC grade 1 and 2 was seen in maximum number of patients. Dental Health Components (DHC) of index of Orthodontic Treatment Need (IOTN) is useful in determining malocclusion.

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