Original Article

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Assessment of Prevalence of Malocclusion and Orthodontic Treatment Need in Young Population

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Abstract

Background: Prevalence of malocclusion and orthodontic treatment need. **Subjects & Methods:** Five hundred eighty subjects of age range 14-17 years of either gender was examined for orthodontic treatment need with Dental Health Component (DHC) of the Index of Orthodontic Treatment Need (IOTN). Treatment needs of the subjects were categorized as grade 1 (no treatment need), grade 2 (mild need), grade 3 (moderate need), grade 4 (severe need), and grade 5 (extreme need). **Results:** IOTN index shows that grade 1 was seen among 22% males and 25% females, grade 2 in 45% males and 42% females, grade 3 in 24% males and 27% females, grade 4 in 5% males and 4% females and grade 5 in 4% males and 2% females. A significant difference was observed in class I, II and III malocclusion, overjet >4mm, cross bite, crowding, TMD and diastema in both genders ($P < 0.05$). **Conclusion:** Most of the subjects had no orthodontic abnormality. Orthodontic treatment needs among study population was lower.

Keywords: Orthodontic treatment needs, Dental Health Component, Malocclusion, Diastema.

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Introduction

Malocclusion is one of the main complaints for which patient visit to the dentist. There are two types of malocclusion such as dental and skeletal. Dental malocclusion is related to tooth position and alignment discrepancy whereas in skeletal malocclusion, there is discrepancy in bone either maxilla or mandible. The motive of orthodontic treatment is to correct malocclusion and to maintain teeth in ideal occlusion. Esthetics is the main concern of the patients.[1]

Health is state of physical, mental and social well- being. Malocclusion is the challenge for both patients and dentists.[2] Based on relation of maxillary first molar with mandibular first molar, we have 3 types of malocclusion. Class I is when mesio-buccal cusps of maxillary first molar falls in mesio- buccal groove of mandibular first molar. Class II is when disto- buccal cusps of maxillary first molar falls in mesio- buccal groove of mandibular first molar. Class III is when mesio- buccal cusps of maxillary first molar falls between mandibular first molar and second molar.[3]

There can be anterior crowding, rotation, tipping etc. also. On an increased basis, malocclusion is considered an expression of normal biologic variation, and treatment need is often based as much on psychosocial concerns as on proven oral health risks attributable to malocclusion.[4] The criteria for determining who is most likely to benefit from orthodontic treatment are controversial. These factors make it particularly difficult for the general dentist to determine for whom orthodontic treatment is clearly indicated, since the traditional pathway to orthodontic care starts at the general dentist's office.[5] Grainger's Treatment Priority Index (TPI) which was proposed in 1960s can be named as one of the most prominent ones. Recently, the Index of Treatment Need (IOTN) was proposed by Brook and Shaw.[6] Considering this, the present study was attempted with the aim of assessing prevalence of malocclusion and orthodontic treatment need.

Subjects and Methods

The present study commenced with the approval from higher authorities and obtaining written consent from five hundred eighty subjects of age range 14-17 years of either gender.

Demographic data of all included subjects was recorded in case history proforma. Each patient was examined for orthodontic treatment need with Dental Health Component (DHC) of the Index of Orthodontic Treatment Need (IOTN). The examination lasted approximately 15 minutes per child as per World Health Organization guidelines. Examination was carried by an Orthodontist using mirror, tweezer and probe under illumination. Treatment needs of the subjects were categorized as grade 1 (no treatment need), grade 2 (mild need), grade 3 (moderate need), grade 4 (severe need), and grade 5 (extreme need). Parameters such as overjet, overbite, crossbite, crowding, diastema and temporomandibular joint disorders were recorded. Results of the present study after recording all relevant data were subjected for statistical inferences using chi- square test. The level of significance was significant if p value is below 0.05 and highly significant if it is less than 0.01.

Results

Table 1: Age & gender distribution

Age groups (years)	Male	Female	Total
14-15	105	110	215
15-16	125	130	255
16-17	50	60	110
Total	280	300	580

Maximum subjects were seen in age group 15-11 years (males- 125, females- 130) followed by 14-15 years (males- 105, females- 110) and 16-17 years (males- 50, females- 60). [Table 1].

Table 2: Grades of the Dental Health Component of the Index of Orthodontic Treatment Need

Grade	Male	Female	95% CI
1	22%	25%	21.8-27.4
2	45%	42%	35.2-43.6
3	24%	27%	23.5-30.6
4	5%	4%	4.2-8.7
5	4%	2%	1.34-3.58

IOTN index shows that grade 1 was seen among 22% males and 25% females, grade 2 in 45% males and 42% females, grade 3 in 24% males and 27% females, grade 4 in 5% males and 4% females and grade 5 in 4% males and 2% females [Table 2].

A significant difference was observed in class I, II and III malocclusion, overjet >4mm, cross bite, crowding, TMD and diastema in both genders (P< 0.05) [Table 3, Figure 1].

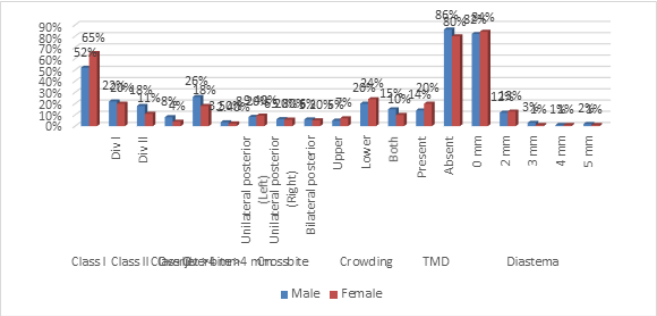

Figure 1: Malocclusion among subjects

Discussion

The people equate good dental appearance with success in many aspects. Increased concern for dental appearance during adolescents to early adulthood has been observed.[7] The literal meaning of malocclusion is bad bite. The malocclusion can be defined as an occlusion in which there is a mal-relationship between the arches in any of the planes or in which there are anomalies in tooth position beyond the normal limits.[8] The individual with malocclusion may feel shy in social contacts, may lose career opportunities and might feel shame about their dental appearance. Malocclusion in itself is neither a disease nor a life- threatening condition; nevertheless, the appearance of the mouth and smile plays a significant role in judgments regarding facial attractiveness.[9] Thus, malocclusion has large physical, social, and psychological impact on the individual and society. Several studies have attempted to provide epidemiological reports of the prevalence of malocclusions in different ethnic groups. The uptake of orthodontic treatment is influenced by the desire to look attractive, self-perception and self-esteem of dental appearance.[10,11] The benefits of taking orthodontic treatment are to prevention of tissue damage and correction of aesthetic component, improve the physical function. Keeping in view, the WHO has recommended Dental Aesthetic Index (DAI) as a method of assessing the dentofacial anomalies. DAI is a cross-cultural index focused on socially defined dental aesthetics.[12] The present study was attempted with the aim of assessing prevalence of malocclusion and orthodontic treatment need.

In our study, Maximum subjects were seen in age group 15-11 years (males- 125, females- 130) followed by 14-15 years (males- 105, females- 110) and 16-17 years (males- 50, females- 60). Josefsson et al,[13] compared the frequency of malocclusion and orthodontic treatment need in 12- and 13-year-olds of Swedish and immigrant background and found a high frequency of treatment need in the Swedish group, with 39.5 per cent classified as grades 4 and 5.

Table 3: Malocclusion among subjects

Parameters	Variables	Male	Female	P value
Class I		52%	65%	<0.05
Class II	Div I	22%	20%	
	Div II	18%	11%	
Class III		8%	4%	
Overjet >4 mm		26%	18%	<0.05
Overbite >4 mm		3.5%	2.4%	>0.05
Crossbite	Unilateral posterior (Left)	8.2%	9.4%	>0.05
	Unilateral posterior (Right)	6.2%	5.8%	
	Bilateral posterior	6%	5.2%	
Crowding	Upper	5%	7%	<0.05
	Lower	20%	24%	
	Both	15%	10%	
TMD	Present	14%	20%	<0.05
	Absent	86%	80%	
Diastema	0 mm	82%	84%	<0.05
	2 mm	12%	13%	
	3 mm	3%	1%	
	4 mm	1%	1%	
	5 mm	2%	1%	

IOTN index shows that grade 1 was seen among 22% males and 25% females, grade 2 in 45% males and 42% females, grade 3 in 24% males and 27% females, grade 4 in 5% males and 4% females and grade 5 in 4% males and 2% females. Jamilian et al,[14] assessed the need for orthodontic treatment among school children of Tehran by means of the Dental Health Component (DHC) of the Index of Orthodontic Treatment Need (IOTN) and also to evaluate the occlusal traits of the subjects. Methods. 684 (343 boys and 341 girls) school children, 15 to 17 years of age, were selected at random from 12 schools to represent the four main areas of Tehran. The final sample who met the inclusion criteria comprised 643 subjects (322 males and 321 females). Malocclusion was determined with the index of orthodontic treatment need. Orthodontic treatment need, using the DHC, was found in only 9.0 per cent of the children. The prevalence of Angle Class I malocclusion in this study was higher than other malocclusions (65.2 per cent), followed by crowding in 62.7 per cent of the subjects.

In our study a significant difference was observed in class I, II and III malocclusion, overjet >4mm, cross bite, crowding, TMD and diastema in both genders. Bilgic et al,[15] determined the prevalence of malocclusion and orthodontic treatment need in a large sample of Central Anatolian adolescents and compare them with European-other nations' adolescents. The sample included 1125 boys and 1204 girls aged between 12 and 16 years with no previous orthodontic treatment history. Occlusal variables examined were molar relationship, overjet, overbite, crowding, midline diastema, posterior crossbite, and scissors bite. The dental health (DHC) and aesthetic components (AC) of the Index of Orthodontic Treatment Need (IOTN) were used as an assessment measure of the need for orthodontic treatment for the total sample. The results indicated a high prevalence of Class I (34.9%) and Class II, Division 1 malocclusions (40.0%). Moreover, increased (18%) and reduced bites (14%), and increased (25.1%) and reversed overjet (10%) were present in the sample.

Conclusion

Most of the subjects had no orthodontic abnormality. Orthodontic treatment needs among study population was lower.

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