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ORIGINAL ARTICLE

Evaluation of orthodontic treatment needs in junior male students of Yazd high schools, Iran

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Background and aim: There are no strict criteria in determining the need for orthodontic treatment and dentists often have different opinion on assessing the orthodontic treatment needs. Making an appropriate estimation of the need and demand for orthodontic treatments is necessary to organize and provide meaningful orthodontic services. In this study, the orthodontic treatment needs were evaluated in highschool boys of Yazd.

Materials and methods: 420 students who were studying in 14 different high schools were randomly selected. All participants were examined under normal white light and DHC(dental health component) ruler. To assess the orthodontic treatment needs, the dental health component of IOTN index was used. The data were analyzed by Chi-square test and p-value was 0.05.

Results: Measurements showed that 44.8% of students scored 1, 15.1% scored 2, 13.6% scored 3, 15.3% scored 4 and 10.7% scored 5 in DHC records. The most frequent malocclusions observed in this study population were contact point displacement (27.3%), crossbite (13.3%), hypodontia (12.8%) and increased overjet (9.3%).

Conclusion: Based on the results, approximately one fourth of participants had definite need for orthodontic treatments (IOTN Grades 4 and 5) which is a warning sign. More studies are needed to be done on different populations of the country to make the governors able for organizing oral health programs and providing beneficial dental insurance.

Key words:IOTN,dental health component(DHC),iranian

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INTRODUCTION

determining the orthodontic treatment needs has always been a major concern for orthodontics. Although the use of orthodontic treatment need indexes has been increasingly widespread in Europe and in USA, unfortunately in Iran there are no strict criteria for determining the treatment needs and therefore no precise information is available regarding the need for orthodontic treatment in society level. At the other hand it is a necessity to know the epidemiology and distribution of dental and jaw abnormalities in order to make promotion on public health and also to provide the society with suitable dental insurance as it has already occurred in developed countries where almost all orthodontic treatment is publicly funded. [1]

One way to determine the orthodontic treatment need is the use of occlusal indexes. Several occlusal indices that attempt to categorize malocclusion into groups according to the level of treatment need have been developed. IOTN consists of two independent components to record the priorities and need for orthodontic treatment; the first dental health component (DHC) determines the need for treatment based on dental health and its functional aspects and the second aesthetic component(AC) is used to make a judgment about treatment based on examiner's or the individual's opinion.[2] In this research the dental component of IOTN was used to assess the orthodontic treatment need of junior male students of Yazd high schools.

MATERIAL AND METHODS

In this descriptive cross-sectional study, 420 male students were randomly selected from 14 different highschools. Based on consultation with the statistician, randomized cluster sampling was used to select 14 highschools from 2 education districts of Yazd. Then 30 students were randomly selected from each school. Students who were wearing orthodontic appliances at the time of the survey and those who were suffering from disease or syndromes affecting the jaw were excluded from the study. In the beginning of the study all participants have signed the written informed consents and filled the demographic questionnaires. Then they were taken under an oral examination which in through the dental traits including, hypodontia, overjet, overbite, cross-bite, openbite, contact point displacement, post normal and prenormal occlusion was recorded. For each student an individual DHC ruler was used and sample was categorized into 5 groups based on the severity of occlusal pattern.

RESULTS

The present study was carried out on 420 male students of Yazd highschools. Results showed that 188 students (44.8%) didn't need orthodontic treatment (DHC score of 1). 61 students (15.9%) had mild/little need to treatment (DHC score of 2). 57 students (13.6%) had moderate/borderline need to treatment ((DHC score of 3). 63 students (15%) had sever need to treatment (DHC score of 4) and 45 students (10.7%) had extreme need to treatment (DHC score of 5) (Table 1).

Table1: Need for orthodontic treatment based on DHC

IOTN based on DHC	frequency	percent%
1; No need	188	44.8
2; little need	67	15.9
3; moderate need	57	13.6
4; severe need	63	15
5; extreme need	45	10.7
Total	420	100

As shown in table 2, the most frequent malocclusions observed in this study population were contact point displacement (27.3%), crossbite (13.3%), hypodontia (12.8%) and increased overjet (9.3%).

Table2: Frequency of occlusal traits

Occlusal traits	frequency	percent
Cross-bite	56	13
Open-bite	23	5.5
Overjet	39	9.3
Negative overjet	8	1.9
Contact point displacement	115	27.3
Overbite	19	4.5
Hypodontia	54	12.8
Post and pre normal occlusion	11	2.6
Semi-erupted tooth	6	1.4
Impeded eruption of teeth	22	5.2
Total	420	100

Table 3 summarizes the distribution of occlusal traits according to the dental health component (DHC) of the IOTN index. The most frequent malocclusion was contact point displacement which was higher in students with DHC score of 3, 4 and 5. Hypodontia was the second most frequent trait particularly in students with DH C score of 4 and 5.

TABLE 3. Distribution of occlusal traits according to the DHC grades of the Index of Orthodontic Treatment Need.

Occlusal traits	DHC 1	2	3	4	5	Total
hypodontia	0	0	0	25	26	51
overjet	0	14	7	1	0	22
Negative overjet	0	4	2	1	0	7
Cross-bite	0	10	13	4	0	27
Contact point displacement	0	24	30	26	0	80
Open-bite	0	9	4	1	0	14
overbite	0	7	1	0	0	8
Semi-erupted tooth	0	0	0	4	0	4
Impeded eruption of teeth	0	0	0	0	19	19
Normal occlusion	188	0	0	0	0	188
Total	188	68	57	62	45	420

DISCUSSION

This study evaluated the orthodontic treatment need of 420 male students in Yazd, Iran. Results indicated that nearly one fourth of the samples definitely need treatment which is similar to the results of previous studies; Safavi et al. reported that 20% of 5200 students in Tehran (with average age of 15) had DHC of 4 and 5 and therefore had definite need to treatment[3]. Similarly Burden et al. in 1994 reported that 23% of 924 students of Manchester, England who aged 11 to 12 had definite need to treatment[4]. Birkland et al. reported that 26.1% of Norwegian students with age of 11 years old definitely need treatment.[5] However the value obtained in this study was different from some of previous studies; Shahri et al. in 2013 showed that 36% of 395 schoolchildren in Zahedan had definite need to treatment which is higher than the results of this study[6]. The racial or geographical differences between the study samples might explain this difference. Also, Farahani et al. in 2008 reported that 36% of 500 students of Esfahan, with average age of 12[7], need orthodontic treatment which is higher than the results of the present study. the different age range between 2 studies samples might be the reason. Burgersdijk et al. reported that 39% of people in Netherlands who aged 15 to 74 need orthodontic treatment[8]. The notable difference between the age range of Burgersdijk study and the present study and also the increased number of tooth loss in that age range could cause such a difference between the results of these 2 studies.

The most common malocclusions related to DHC were Hypodontia and Impeded eruption of teeth in students with DHC score of 5 and contact point displacement and hypodontia in students with DHC score of 4. Regardless of DHC score, contact point displacement was the most common malocclusion which is similar to the study of Burden and Holmes[5,9]. Compared to other studies, hypodontia had higher incidence in present research. It could be explained by high incidence of first permanent molar extraction in this population that might be due to lack of dental knowledge, erroneous extraction of first permanent molar instead of second primary molar and the high price of root canal therapy. In terms of treatment need rate, as stated above, there were not much differences between the results of this study and previous ones which could be the indication of homogeneity of this study participants.

CONCLUSIONS

Based on the results, approximately one fourth of participants had definite need for orthodontic treatments (Grades 4 and 5) which is a warning sign. More studies are needed to be done on different populations of the country to make the governors able for organizing oral health programs and providing beneficial dental insurance.

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