Comparison of Normative and Self-Perceived Orthodontic Treatment Needs of 11-14 Year-Old Schoolchildren

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Abstract

Aim: Occlusal indices used to determine orthodontic treatment needs cannot include the patients' perception about their need for orthodontic treatment. That is why in some cases, these indices show that a particular patient needs orthodontic treatment while the patient feels no such need. This study was carried out to compare normative and self-perceived orthodontic treatment needs of 11-14 year-old school children.

Materials and Methods: In a descriptive cross-sectional study 250 children of 11 to 14 years old were selected randomly. The scores of the Aesthetic Component (AC) of IOTN, were determined by specialist and the children themselves. The Dental Health Component (DHC) of IOTN was also assessed.

Statistical analysis used: correlations between the AC of the patient, AC of the specialist and DHC of the specialist were assessed using Spearman's rho correlation coefficient.

Results: The mean of patient's AC and specialist's AC were 2.556 and 4.308, respectively, while the mean of specialist's DHC was 2.60. The correlation coefficient between patient's AC and specialist's AC was 0.281, between specialist's AC and DHC was0.549 and between patient's AC and DHC was 0.210. The highest correlation was seen between specialist's AC and DHC and the lowest correlation was seen between patient's AC and DHC.

Conclusion: The significant positive relation between the AC indices and the DHC indicates their ability to determine the need for orthodontic treatment. The highest need for orthodontic treatment was determined by specialist's AC and the lowest was patient's AC.

Keywords: Self-perceived, normative, treatment need, IOTN

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The "index of orthodontic treatment need" (IOTN), as a well-known index in orthodontics, classifies malocclusions based on individual's occlusal indices and has two components: Aesthetic Component (AC) and Dental Health Component (DHC).[1]

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Using IOTN as a tool for research and in offering orthodontic treatments has gained an increasing popularity and its Aesthetic Component (AC) has been used in patient education programs.[2,3] Its easiness of use as well as the very high level of agreement between IOTN ratings determined by clinicians, children and their parents are the most significant advantages of this index.[4] It has been shown that if this index is determined by non-specialists in oral health, its reliability will increase.[5] In addition, IOTN provides better clinical judgments in comparison with other methods and in assessing the need for orthodontic treatment there is a particular congruence between

Aesthetic Component and Dental Health Component of IOTN.[6,7]

On the basis of occlusal indices, the need for orthodontic treatment is determined according to the clinician's view (normative or real need) with no consideration of the patient's perceptive, functional and social needs. However, the importance of viewpoints of patients, as the main recipients of orthodontic treatments, which should result in improved function and beauty, cannot be ignored.[8] Also, being interested in receiving orthodontic treatment is primarily influenced by demand and is not always a result of real need. [9] Hence, determining the need by a clinician may not be a useful tool for determining the need for orthodontic treatment. It seems that personal perceptions of applicants for orthodontic treatment, their reasons and expectations, although dispersed and even contradicting in some cases, plays an essential role in achieving a successful treatment. So, when the individual's tendency for treatment is in agreement with scientific principles and the clinician's opinion performing the treatment will be inevitable.[10] The normative need for orthodontic treatment is generally more than the self-perceived need expressed by the patient.[11-13] A less than 60% agreement between the normative need and the patient's demand for orthodontic treatment has also been reported.[14] In those who are deemed to be in need of orthodontic treatment according to objective criteria, not all of their subjective and personal needs are taken into account and vice versa.[13,14] In assessing the factors that influence the normative and self-perceived needs the role of variables such as gender, social status and place of residence (urban and rural) has been mentioned an different results are reported.[15-17]

Given the essential role of patients' views in determining the need for orthodontic treatment and some reports of lack of agreement between their normative and self-perceived needs, the present study was carried out to compare normative and self-perceived orthodontic treatment needs of 11-14 year-old children in Qazvin, IRAN.

Materials and Methods

This descriptive cross-sectional study was carried out on 250 children of 11 to 14 years old with equal distribution of genders. The patients were included in the study depending on their ability and interest. The project was a DDS project that was fully sponsored by school of dentistry. The samples were selected randomly using a two-stage stratified cluster sampling method and in order to increase the similarity between the sample and the studied population, as well as its accuracy, various parameters relating to different social classes were also taken into account. Those students who had history of orthodontic treatment were excluded. The reason for choosing this age group was that in these years all or most of their anterior permanent teeth have erupted and most of them have not experienced orthodontic treatment procedures. The study's questionnaire was given to those students who had brought a written consent. They were divided into small groups and taken to separate rooms to indicate their need for orthodontic treatment on the basis of aesthetic component of IOTN. There was no opportunity for these students to discuss their scores. To this end, ten color pictures for classifying the appearance of teeth into ten degrees were given to them for comparing with their own teeth and obtaining their self-perceived need. Before looking at the pictures, it was explained for the individual that these pictures are categorized from the best and most beautiful condition of the teeth (No. 1) to the worst one (No. 10). They were asked

to compare these pictures with their own teeth and give a score to themselves. The given score was considered as their self-perceived need. Then the examiner determined the aesthetic component for each child independently and on the basis of his judgment that was calibrated with an orthodontist, which was considered as the normative need. Selection of pictures 1 to 4 indicated little or no need, pictures 5 to 7 a borderline need and pictures 8 to 10 a serious need for orthodontic treatment. Referring to the DHC table, the score of this component was determined by the orthodontist. The Dental Health Component (DHC) of IOTN has 5 degrees and scores equal to2 and 1 indicate little or no need, a score equal to 3 a borderline need and scores equal to 5 and 4 a serious need for orthodontic treatment. The Aesthetic Component (AC) of IOTN included ten color pictures on the basis of which scores of 1, 2, 3 and 4 indicated little or no need, scores of 5, 6 and 7 a borderline need and scores of 8, 9 and 10 a definite need for orthodontic treatment.

In order to assess the reliability of examiner in the study, he had taken part in a related workshop and his reliability in evaluating the IOTN of 23 photograph of various patients was verified (Kappa = 0.785).

The relation between variables was obtained through using Spearman's rho correlation coefficient. Wilcoxon Signed Rank test was used to compare the self-perceived and normative need of the students.

Results

The mean age of the students was 12.47±1.11 years. The table 1 and chart 1 Show the results of assessment of the need for orthodontic treatment on the basis of the perceived need, normative need and DHC.

The results of assessment of the need for orthodontic treatment on the basis of the DHC, as determined by the specialist, showed that 19.2% of the students had a score of 1, 30.8% had a score of 2, 26.4% had a score of 3, 18% had a score of 4 and 5.6% had a score of 5. The mean score of the DHC of IOTN as determined by the specialists was 2.60±1.15 (Table-1 and Chart-1).

The relation between the scores of the AC and DHC of IOTN of the students was analyzed by Spearman's rho correlation coefficient (Table-2). There were statistically significant relations between various components of this index.

Table 1- Distribution of the 11 to 14 year old children, based on the AC of IOTN, as determined by the children and the specialist, and the DHC in 2008

DHC	Normative need	Self-perceived need	index / index value
48 (19.2%)	12(4.8%)	63 (25.2%)	1
77 (30.8%)	46 (18.4%)	85 (34%)	2
66 (26.4%)	49 (19.6%)	59 (23.6%)	3
45 (18%)	31 (12.4%)	15(6%)	4
14 (5.6%)	44(17.6%)	15 (6%)	5
-	36 (14.4%)	6 (2.4%)	6
-	9 (3.6%)	-	7
-	12(4.8%)	5 (2%)	8
-	3 (1.2%)	2(0.8%)	9
-	8 (3.2%)	-	10

Table 2- Assessment of the relation between the AC of different groups and the DHC of the specialists in 11 to 14 year old children in 2008

DHC	Normative need	Perceived need	
r=0.210 P< 0.001	r=0.281 P< 0.001	-	Perceived need
r=0.549 P< 0.0001	-	r=0.281 P< 0.0001	Normative need
-	r=0.549 P< 0.0001	r=0.210 P< 0.001	DHC

The highest correlation coefficient was between the AC determined by the specialist and the DHC of the specialist and the lowest correlation coefficient existed between the DHC determined by the specialist and the AC of IOTN, as determined by the students.

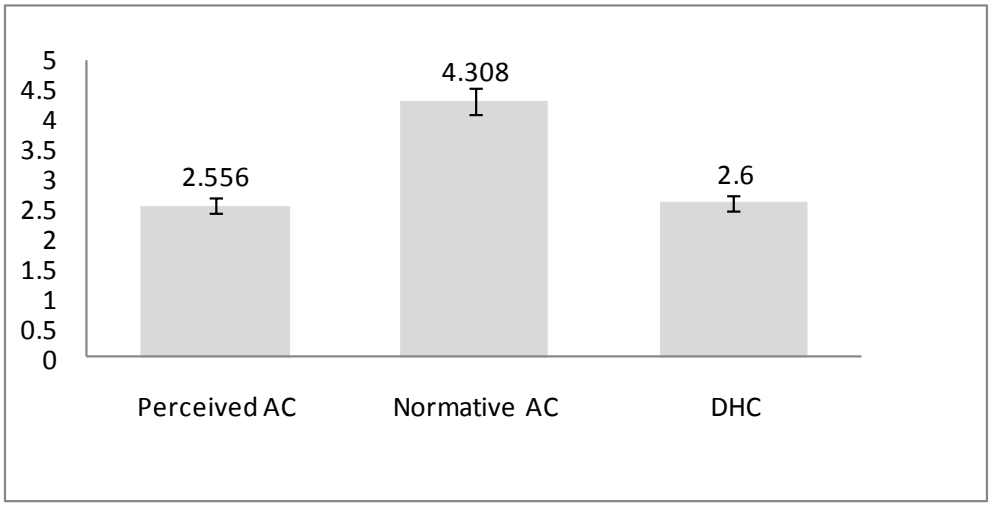
According to the AC of IOTN, as determined by the students, it became evident that 88.8% had little or no need for treatment, 8.4% had borderline need and 72.8% had definite need for orthodontic treatment.

Based on the normative need, 55.2% had little or no need for treatment, 35.6% had borderline need and 9.2% had definite need for orthodontic treatment.

Assessment of the DHC of IOTN showed that 50% had little or no need for treatment, 26.4% had borderline need and 23.6% had definite need for orthodontic treatment.

The orthodontic treatment need of children, as determined by self-perceived and normative needs were compared with each other by Wilcox on Signed Rank test and the results showed statistically significant differences between these pairs (in all cases P< 0.0001).

Chart 1- Distribution of the 11 to 14 year old children, based on the mean and standard deviation of the perceived need, normative need and DHC.



Discussion

The results of the present study showed that specialists determine more need for treatment for people. So 6.4% of the patients who feel no need for orthodontic treatment need treatment according to specialist opinion. De Oliveira etal.[18], showed similar discrepancies in using the IOTN according to self-perceived and normative determination of need for orthodontic treatment in England. Other studies have reported such discrepancies, too. [9, 19]

Paying attention to opinions of patients, as well as their reasons for seeking treatment and their expectations of treatment, although dispersed and even contradicting in some cases, plays an essential role in achieving a successful outcome. Therefore, when the individual's tendency for treatment is in agreement with scientific principles and the clinician's opinion, performing the treatment will be inevitable.[10] Hence; it can be said that probably measuring the normative need of the individual for orthodontic treatment cannot determine his/her self-perceived need for orthodontic treatment or predict his/her demand for it. Evidently, specialized opinions do not consider various aspects of patient's satisfaction with his/her dental appearance. On the other hand, offering treatment based on normative need may cause bias in selection of patients in favor of treatment provider(s). Moreover; previous knowledge of the students regarding the arrangement and order of teeth, prior experience with orthodontic treatment and presence of a dentist or an orthodontist in their family may affect their assessment of their need for orthodontic treatment. Of course, when a person cannot give a correct description of his/her dental status, in particular about such instances as open-bite or antero-posterior components of malocclusion, because of their complexity, using the patients' view for determining their need for orthodontic treatment will not properly describe their need for treatment.

Assessing the relation between the AC and DHC of IOTN revealed that there have been statistically significant relations between various components of this index. The high level of correlation between these indices indicates their strength in assessing the occlusal status of patients; so that all of them can be considered as having accuracy and validity in this regard. The highest correlation existed between the DHC and AC, as determined by the specialist, and the lowest correlation existed between the DHC and AC, as determined by the patients. In other words, the DHC of IOTN and the AC, as determined by the specialist, had a very high level of agreement. However, because the specialists determined the DHC and the patients determined the AC, their level of agreement was not at the same level as that of other assessments. This shows that, despite the high importance of the patients' views in determining the need for orthodontic treatment; it may have disagreement with specialists' views in some cases. This disagreement may be due to insufficient education of patients, inability to understand certain malocclusions, inability to provide a correct classification of their dental status, in particular about open-bite or antero-posterior components of malocclusion, because of their complexity.

Shue-Te Yeh etal.[8] in assessing the relation between the two indices of DAI and IOTN and the individual's perception about aesthetics, function and speech with his/her need for orthodontic treatment, showed that there is a statistically significant relation between the two components of IOTN. Minor differences between the results of these two studies may be due to differences in the study populations and sample sizes of the two studies. Kerosou etal.[20] in assessing the need for orthodontic treatment showed that both the DHC and the AC of IOTN

have a positive relation with the patients' feeling of need for orthodontic treatment. In 53% of their patients, there was a complete agreement between the need for orthodontic treatment, according to the patient's view, and the score of the DHC of IOTN.

Today, various studies on newer indices in determining the need for orthodontic treatment, along with IOTN, are being performed. These indices, in addition to having the strengths of the accepted indices, provide other information about the outcome of treatment and their efficiency in determining the need for orthodontic treatment has been confirmed in some studies.[21] Also, using the Oral Health-related Quality of Life and considering it in determining the need for orthodontic treatment, can be an important step toward relating the patients, dental students and specialists views regarding orthodontic treatment It seems that further investigations using newer indices as well as using the criteria of the Oral Health-related Quality of Life can provide new ideas in this regard for researchers.

The results of the present study revealed that there is a statistically significant and positive relation between the normative and self-perceived orthodontic treatment needs of 11-14 year-old children. This is an indication of these indices' potential in detecting the occlusal status of the subjects and in determining their need for orthodontic treatment. The AC of IOTN, according to the specialists' opinion, determined the highest need for orthodontic treatment. It seems that using the patients' opinion in determining the need for orthodontic treatment, along with normative needs, can provide an accurate estimate of the need for orthodontic treatment.

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