

# USE OF INDEX OF ORTHODONTIC TREATMENT NEEDIN DETERMINING ORTHODONTIC TREATMENT NEEDS OF PESHAWAR ADOLESCENT

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## ABSTRACT

**Objective:** To determine the use of an index of orthodontics treatment need (IOTN) in orthodontic treatment needs of Peshawar adolescent.

**Materials and Methods:** This descriptive cross sectional included 200 young people by consecutive sampling technique from August 2018 to February 2019. The examinations were done on the study models and all-encompassing radiographs taken from every subject. The Dental Health Component (DHC) and Aesthetic Component (AC) segments of the IOTN were applied as an evaluation measure of the requirement for orthodontic treatment. Data were analyzed in SPSS version 20.0. The Pearson correlation test was run to examine the relation between the DHC and the AC of the IOTN.

**Results:** out of total  $n=200$ , the females were  $n=130(65\%)$ , and males were  $n=70(35\%)$ . The mean age was  $22.7\pm 5.95$  years. The most frequent group of IOTN health component was 'no need'  $n=92(46\%)$  followed by 'need' was  $n=63(31.5\%)$  and least was 'borderline need' was  $n=45(22.5\%)$ . The most frequent group of IOTN esthetics component was 'no need'  $n=90(45\%)$  followed by 'need' was  $n=62(31\%)$  while least was 'borderline need' was  $48(24\%)$ . The correlation between the IOTN health and IOTN aesthetic component was very strong and significant ( $r=0.976$ ,  $P<0.001$ ).

**Conclusion:** Based on the IOTN assessment in our population, only one-third of the presenting are in 'need' of treatment, and one fifth is in 'borderline need'.

**Keywords:** IOTN, Treatment need, Orthodontic treatment

## INTRODUCTION

In recent years, much attention has been focused on measuring the severity and prevalence of malocclusion and orthodontic treatment needs worldwide.<sup>1</sup> In particular, the etiological importance of genetic factors has been reduced, considering that many malocclusions recognize a post-natal origin, related to non-Nutritive or nutritive sucking habits at early stages of life and traumas.<sup>2,3</sup> Moreover, the expanded opportunities in orthodontic treatment demand more

careful individual evaluation of treatment needs and standardized criteria for their assessment. Indeed, it has been reported that a significant number of children are inappropriately referred for orthodontic treatment,<sup>4</sup> underlying the necessity of objective or normative assessment of orthodontic treatment by the use of an index.<sup>5</sup>

The Index of Orthodontic Treatment Need (IOTN), with dental health (DHC) and the aesthetic components (AC), is the most frequently utilized apparatus for measuring treatment needs. As per Brook and Shaw, the duplicability of the DHC of the original IOTN is dependable in ideal clinical settings. For the AC of the original IOTN, they informed well inter and intraexaminer reproducibility when a dental specialist evaluated a kid for aesthetic debasement.<sup>6</sup>

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Padisar et al.<sup>7</sup> found a critical relationship between the AC, the DHC, and dental aesthetic index in the evaluation of orthodontic treatment needs of 11 – 14 years of age school children in Qazvin.

Gelgor<sup>8</sup> evaluate orthodontic treatment need (OTN) in a juvenile populace, utilizing the Index of Orthodontic Treatment Need (IOTN), including sexual orientation contrasts evaluation. Their results showed that Utilizing the DHC of the IOTN, the extent of subjects assessed to have an incredible or extremely extraordinary treatment need was 28.7%, and 16.7% were in need (grades 8 - 10) as indicated by the AC (IOTN). No sexual orientation contrasts were noted, with the exception of no need class of the IOTN (more successive in young men) as per the DHC (chi-square: 6.83, df: 1, P = 0.01). There was a moderate agreement between the DHC and the AC of the IOTN (kappa = 0.49, 95% CI, 0.47 - 0.63).

There is a lack of research on the need for orthodontic treatment using IOTN in the local population. The aim of this study was the use of IOTN in determining the orthodontic treatment needs of Peshawar adolescents. The need-based treatment is important for developing county like Pakistan because of the limited facility. This will provide local statistics to create a treatment priority index for our patients.

## MATERIALS AND METHODS

Ethical approval was obtained from the hospital ethical committee. This descriptive cross-sectional included 200 young people (70 boys, 130 girls) by consecutive sampling technique from August 2018 to February 2019. Both gender, Pakistani nationals, age from 12 to 35 years, and medically healthy individuals were included. Every examination was completed with the individual setting in a dental unit, utilizing an assessment reflection under normal lighting. This was followed by alginate impressions with a wax bite for every subject. The panoramic radiographs were obtained when hypodontia or other dental inconsistencies were suspected. Every malocclusion was re-examined utilizing the dental casts as a result of study models of the subjects gave a tri-dimensional survey. The IOTN was recorded, which comprises of the DHC and the AC by the second-year trainee (FCPS). Contemplations as to “no treatment need,” “marginal need,” or “great need” depended on five grades in the DHC and ten grades in the AC.

The data were analyzed using SPSS version 20.0. Mean, and the standard deviation was calculated for a numerical variable like age. Frequency and percentages were computed for qualitative variables like various gender grades of IOTN DHC. The Pearson correlation was utilized to break down the agreement between the DHC and the AC of the IOTN. Stratification for gender was done to see effect modifiers. A post-stratification chi-square test was applied. P < 0.05 was considered statistically significant.

## RESULTS

Out of the total 200 samples, the females were n=130(65%), and males were n=70(35%). The mean age was 22.7±5.95 years. The most common age group was 21-30 years n=106(53%) followed by 12-20 years n=71(35.5%) and least was in >31 years n=23(11.5%). (Table 1)

The IOTN was categorized into three groups. Grades 1 – 4, ‘No Need’; Grade 5 - 7, ‘Borderline Need’; Grades 8 - 10, ‘Definite Need’. The most frequent group of IOTN health component was ‘no need’ n=92(46%) followed by ‘need’ n=63(31.5%) while least was ‘borderline need’ was n=45(22.5%). (Fig1) Similarly, the most frequent group of IOTN esthetics component was ‘no need’ n=90(45%) followed by ‘need’ was n=62(31%) and least was ‘borderline need’ was n=48(24%). (Fig 2)

The correlation between IOTN Health and IOTN aesthetic component was very strong and significant (r=0.976, P<0.001). (Table 2 & Fig 3) The Comparison of IOTN aesthetics and health components were not statistically significant (P>0.005). (Table 4 & 5).

## DISCUSSION

In this study, we used IOTN to determine the need to present patients to the department of Orthodontics, Khyber College of Dentistry, Peshawar. When the IOTN index is utilized, the certainty level is much greater for determining patients’ need for treatment. Our findings showed that based on the IOTN assessment in our population, only one-third of the presenting patients are in ‘need’ of treatment, and one fifth is in ‘borderline need.’

The orthodontic need has been shown in different studies utilizing distinctive indices for defining OTN TN.<sup>9, 10</sup> In this research, the classification by the IOTN was utilized as one of the author’s best

Table 1: Age distribution of the sample

Age group (years)	Frequency	Percent
12-20	71	35.5
21-30	106	53.0
>31	23	11.5
Total	200	100.0

Table 2: Correlation between IOTN Health and IOTN aesthetic component

		IOTN aesthetic component
IOTN Health component	Correlation Coefficient	.976**
	Sig. (2-tailed)	0.000
	N	200

\*\* . Correlation is significant at the 0.01 level (2-tailed); Spearman’s rho

Table 3: Comparison of IOTN Health component among genders

IOTN Health component	Gender				P-value
	Male		Female		
	N	%	N	%	
No need	31	44.30	61	46.90	0.614
Boderline need	14	20.00	31	23.80	
Need	25	35.70	38	29.20	

Chi-square value=0.975; df=2

Table 4: Comparison of IOTN aesthetic component among genders

IOTN aesthetic component	Gender				P-value
	Male		Female		
	N	%	N	%	
No need	29	41.40	61	46.90	0.567
Boderline need	16	22.90	32	24.60	
Need	25	35.70	37	28.50	

Chi-square value=1.136; df=2

known for IOTN. Because of IOTN’s prevalence, another index has additionally been gotten from IOTN, evaluating the orthognathic useful treatment need (IOFTN).<sup>11</sup>

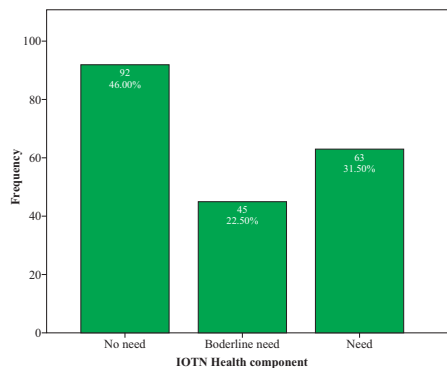


Fig 1: Frequency of IOTN Health component

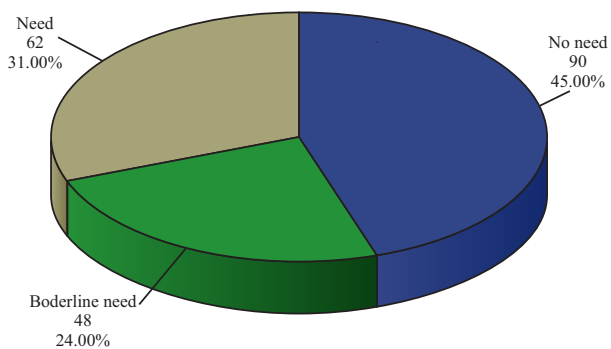


Fig 2: Distribution of IOTN aesthetics component

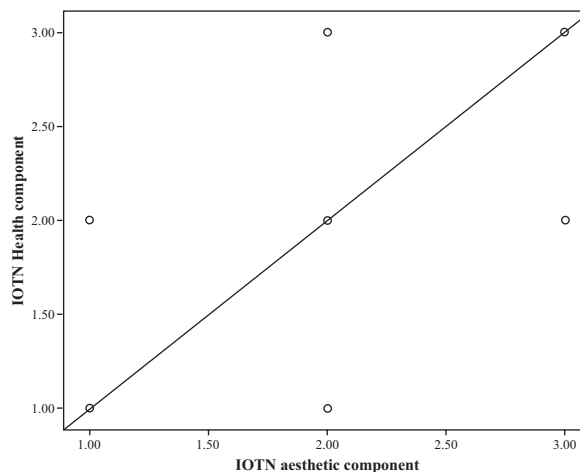


Fig 3: Scatter plot between IOTN health and esthetics component

In our study, the females were more in number than males. This may be because of more awareness and consciousness among females about their denotofacial esthetics. Gelgor reported similar results in Turkey population in a study on the use of IOTN in determining orthodontic treatment needs of Turkish adolescents.<sup>8</sup>

In the current study, the most common age was the fourth decade. This may be because in the age group the patients are more financially independent and can manage their treatment time in a better way than other age groups.<sup>12</sup>

In our study, about one-third of the patients were in need of orthodontic treatment. The estimate of one-third of the subjects needing orthodontic treatment is like the figures covered in the permanent dentition utilizing the DHC of the IOTN for British,<sup>13</sup> for Jordanian,<sup>14</sup> for Colombian (25), for Senegalese,<sup>15</sup> for Iranian<sup>16</sup> children however lower than the reported gauges by Beglin et al.<sup>17</sup> for the United States youngsters and higher than the evaluated requirement for the Nigerian teenagers.<sup>18</sup>

Our results showed there was a very high correlation between DHC and DAC of IOTN. This implies that we can only use the dental health component for assessing the need for orthodontic treatment. Similar findings are available in literature.<sup>19</sup>

## CONCLUSION

Based on the IOTN assessment in our population, only one-third of the presenting patients are in 'need' of treatment, and one fifth is in 'borderline need.'

## STRENGTH OF STUDY

This is the first kind of study conducted on a sample of the Peshawar population determining the need for orthodontic treatment. This study used IOTN as a tool validated by literature.

## LIMITATIONS OF STUDY

This is a hospital-based and single centered based study, so further community-based studies are needed on this perspective to explore this area also.

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