Original Article

THE AESTHETIC COMPONENT OF INDEX OF ORTHODONTIC TREATMENT NEED (IOTN): A POPULATION BASED STUDY IN TWO HEALTH DISTRICT OF PUNJAB, PAKISTAN

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ABSTRACT:

OBJECTIVE: The Index of Orthodontic Treatment Need (IOTN) was developed with aim to access treatment needs of orthodontic patients, and consisted of aesthetic component and the dental health component. The aim of current study was to apply aesthetic component of Index of Orthodontic treatment need in two local health districts of Punjab, Pakistan.

MATERIAL & METHODS: In current cross sectional study, aesthetic component of index of orthodontic treatment need was applied using frontal intraoral photographs of 100 patients. The frontal pictures were compared with intraoral template photographs of aesthetic component of index of orthodontic treatment need, to find out the orthodontic treatment need in Pakistani subjects. The data was collected and analyzed using SPSS 23.0.

RESULTS: Results showed that 80 % of the subjects needed orthodontic treatment, out of which, 40% were female and 60% were male. Greater percentage of males was found in definite treatment need than females as per the aesthetic component of index of orthodontic treatment need. 20 % of the patients were classified as being in need of little/no treatment need.

CONCLUSION: It was concluded that a high number of cases were in need of the orthodontic therapy as per the aesthetic component of index of orthodontic treatment need.

KEYWORDS: Aesthetic, IOTN, Index.

INTRODUCTION:

Any numerical scoring system that rate patient's occlusion or malocclusion can be labelled as orthodontic index.[1] Several orthodontic indices have been developed to rate and score patient's malocclusion and in order to find out the orthodontic therapy need.[2,3] The index of orthodontic treatment need (IOTN), Peer assessment rating (PAR) and the index of complexity, outcome, and need (ICON) are perhaps the most commonly used orthodontic indices.[4-6] In addition to rating malocclusion and finding orthodontic therapy, these indices were also utilized for diagnosis of various orthodontic conditions and to plan orthodontic funding programmes.[7]
There are certain limitations of PAR and ICON index, which resulted in development of IOTN index. Limitations of PAR and ICON orthodontic indices are; applicability in UK subjects only, decreased rating of over bite and over rating of

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over jet malocclusions, and no scoring for upper lower incisor inclinations and rotations.[7,8]

There are several studies available on comparison and validity of orthodontic indices i.e. IOTN, PAR and ICON.[9-11] The Index of Orthodontic Treatment Need was introduced by Brook and Shaw in 1989 to score and rate orthodontic treatment need, the IOTN index was developed from index of treatment priority used by the Swedish Dental Board.[12] The IOTN index consisted of two components, the Aesthetic component and the Dental Health component.[12] There are five categories of health portion of IOTN, namely; no need of orthodontic therapy, little need of orthodontic therapy, borderline need of orthodontic therapy, great need of orthodontic therapy and very great or definitive need of orthodontic therapy[12].

The aesthetic component of index of orthodontic treatment need provided a measurable, visual assessment of patients' malocclusion and their orthodontic treatment needs. Scoring system of aesthetic component of index of orthodontic treatment need is as follows (figure 1)[12].

Scoring 1-4 represented no or slight need for treatment.
Scoring 5-7 represented moderate or borderline need.
Scoring 8-10 represented definite need.

This cross sectional research was conceived with an aim to test the aesthetic component of index of orthodontic treatment need in two local health districts of Punjab, Pakistan, to find out the need of orthodontic therapy.

METHODOLOGY:

Current cross sectional study was conducted at Orthodontic centres of two public sectors dental hospitals of Punjab i.e. Faisalabad medical university and de'Montmorency college of dentistry, Pakistan. Duration of study was 1.4.2017 to 1.9.2017.

Inclusion Criteria
Patients were selected according to the following inclusion criteria: Fully erupted teeth from second molar to second molars, 12 to 18 years of age, and patients ready to give informed consent. Patients were excluded according to the following criteria: Any previous

episodes of orthodontic therapy, orofacial syndromes, and cleft lip or palate.

Aesthetic component of index of orthodontic treatment need was applied using frontal intraoral photographs of 100 patients. The frontal pictures were compared with intraoral template photographs of aesthetic component of index of orthodontic treatment need, to find out the orthodontic treatment need in Pakistani subjects. Intraoral pictures were scored from the front view for aesthetic component of index of orthodontic treatment need for different levels of dental attractiveness according to the 10-point scale as shown in figure I.

Aesthetic component of index of orthodontic treatment need was scored in every patient by one specialist orthodontist. Scoring was done as follows:[12].

Scoring 1-4 represented no need for treatment.
Scoring 5-7 represented moderate need
Scoring 8-10 represented definite need

One expert orthodontist who was calibrated in the IOTN scored the 100 photographs using the aesthetic component of IOTN index. 3 weeks later, a random set of 25 photographs was chosen and rated again by the expert orthodontist to test intra-examiner reliability.

The kappa statistics was used to evaluate the intra-examiner reliability. The mean age and gender distribution was calculated. Mean and SD for the age of the subjects for aesthetic component of index of orthodontic treatment need, categories was calculated. Descriptive statistics were presented as frequencies (per cent) for distribution of aesthetic components, gender, and mean ($\pm$ SD) for age. Chi-square test was applied for proportion test. The data was collected and analyzed using SPSS 23.0. The P value less than or equal to 0.05 was considered as statistically significant.

RESULTS:

With regard to Intra-examiner agreement, values of weighted kappa statistic (0.88) showed good Intra-examiner agreement for the 25 photographs that were evaluated twice.

The mean age of sample was 17.14$\pm$3.42 years. Results showed that 80% needed treatment, while only 20 % were classified as in need of little or no treatment. By proportion test results showed that significantly high number of

patients needed treatment (P= 0.001). Out of 80% patients that needed treatment, 40% were girls and 60% were boys so greater percentage of boys was found in treatment need than girls according to aesthetic component of index of orthodontic treatment need but this difference was insignificant(P= 0.170)
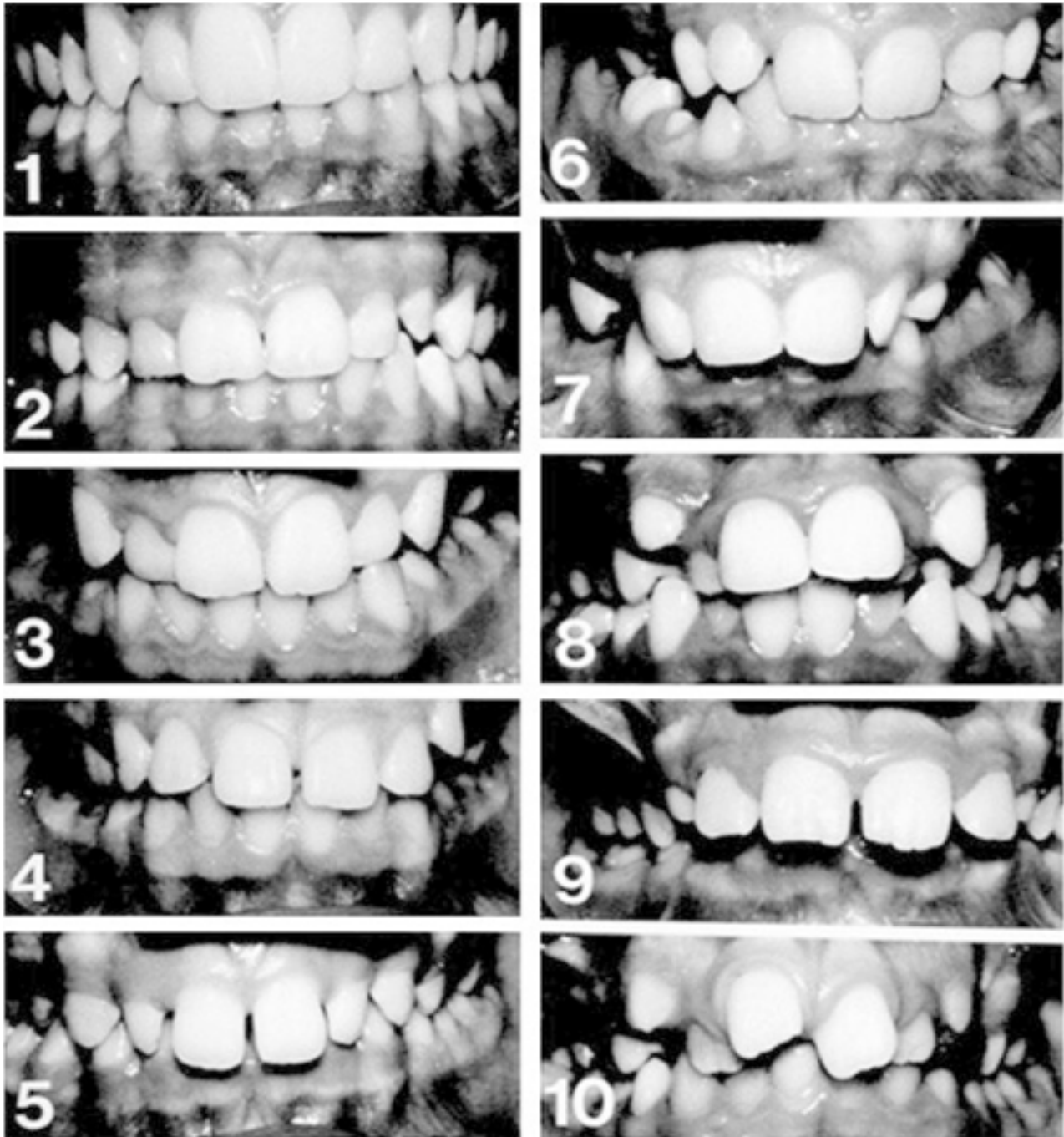

Figure I: Aesthetic Component of IOTN[12]

Table II.
Results of aesthetic component of index of orthodontic treatment need. (n=100)

Grades	Observed N	Expected N	Residual
Definitive to Moderate therapy Need	80	50	30.0
Little or Notherapy Need	20	50	-30.0
Total	100		

Test Statistics

Grades	Therapy need
Chi square	12.22
df	1
Asymp. Sig.	0.001

DISCUSSION:

Current cross sectional study was conducted with an aim to analyze the aesthetic component of index of orthodontic treatment need in Pakistani patients, in order to find out the need of orthodontic treatment. Aesthetic component of index of orthodontic treatment need was applied using frontal intraoral photographs of 100 orthodontic patients. The frontal pictures were compared with template photographs given in aesthetic component of index of orthodontic treatment need. The sample for the present study was not taken from general population, but from the orthodontic subjects presenting at Orthodontic centres of two public sectors dental hospitals of Punjab i.e. Faisalabad medical university and de'Montmorency college of dentistry, Pakistan.

Results of present study showed that 80% needed treatment, while 20 % were classified as in need of little treatment. Results of present study can be compared with other studies.[13-17] Zahid et al.[13] showed that 36.3% of the population was in definite treatment need according to Aesthetic component of IOTN. Similarly, our results are in agreement to findings of Naeem et al.[14] who found that 41 % of the cases needed definite care, 41 % of the patients needed moderate care, with 18 % having no care need as per aesthetic component of IOTN.

In present study, out of 40% patients that needed definite treatment, 40% were girls and 60% were boys so greater percentage of boys was found in definite treatment need than girls according to aesthetic component of index of orthodontic treatment need. Results of present study can be compared with other studies as per gender distribution for orthodontic treatment need.[13-17] In a study by Zahid et al,[13] 12.5% of female patients and 23.5 % of male patients were found to be needed definite orthodontic treatment according to aesthetic component of IOTN, thus greater percentage of males was found in definite treatment need than females, which is in agreement with findings of present study. Similarly, our results are also in agreement with findings of Naeem et al.[14] who found that out of 41 % of the cases needed definite orthodontic treatment, 37 % of female patients and 52 % of male patients needed definite orthodontic treatment. Our results are however in contrast to results of few other studies, where no gender differences for treatment need was found.[18-21] Zahid et al.[15] in another study, also showed that no significant gender difference was found for treatment need which is in contrast to findings of current study.

Findings of current study can be applied to prioritize orthodontic patients presenting at public sector orthodontic centres of Pakistan particularly Punjab, so that patients with definitive treatment need get orthodontic treatment on priority basis in presence of limited budget and resources. This is not different from UK where IOTN was applied in NHS, to prioritize orthodontic patients, so that

patients with definitive treatment need get orthodontic treatment on priority basis and unnecessary treatment of no need patients can be avoided.[21-25]

There are few limitations of present research such as, small sample size, cross sectional design and shorter research period. However, in view of certain limitations still current research provided scientific evidence regarding need of orthodontic therapy in Pakistani subjects as per aesthetic component of IOTN. Further research with larger sample size is suggested to further establish the norms of need of orthodontic therapy in Pakistani subjects as per aesthetic component of IOTN.

CONCLUSION:

In the current study, application of aesthetic component of index of orthodontic treatment need in two local health districts of Punjab, Pakistan, revealed that:

· Increased number of subjects were in high/moderate need of orthodontic treatment.
· 80% needed definite/moderate treatment, while 20 % were classified in no or little need of orthodontic treatment.
· Males were found to be more in need of orthodontic treatment than females but differences were insignificant.

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