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ORTHODONTIC TREATMENT;

ORTHODONTIC TREATMENT NEED AT FAISALABAD MEDICAL UNIVERSITY AND DE'MONTMORENCY COLLEGE OF DENTISTRY

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ABSTRACT... Introduction: The Index of Orthodontic Treatment Need (IOTN) was proposed by Brook and Shaw, included an Aesthetic portion having ten levels and a Dental Health Component (D-IOTN) with five levels. The aim of present cross sectional research was to apply the D-IOTN in Pakistani subjects visiting Orthodontic centres of Faisalabad Medical University and de'Montmorency College of Dentistry. **Study Design:** Cross sectional study. **Setting:** Orthodontic centres**,** Faisalabad Medical University and de'Montmorency Dental College. **Period:** From 1.3.2017 to 1.10.2017. **Materials & Methods:** D-IOTN was applied to subjects using clinical intraoral evaluation method in which patients were evaluated on dental chair to grade various aspects of D-IOTN. The intraoral examination was done for missing teeth, clefts of lip and maxilla, impeded tooth eruption and sagittal molar relationship. Vernier calliper was used to measure the horizontal and vertical overlapping of incisors, transverse cross bite and displacement of incisal or posterior segments of arch. Findings were collected and recorded on a predesigned D-IOTN Performa. **Results:** Results showed that 68 % of the subjects needed definite orthodontic treatment, out of which 55% were females and 45% were males. No significant gender difference was found for treatment need in any of the grade of D-IOTN.D-IOTN analysis revealed: 15% (Grade 5), 53% (Grade 4), 16% (Grade 3), 14=% (Grade 2) and 2% (Grade1) results.16 % of the subjects were found to be in moderate need of treatment, while only2 % were found to be having no orthodontic treatment need. **Conclusion:** It was concluded that a high number of cases were in need of the orthodontic therapy.

Key words: ICON; IOTN; PAR.

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INTRODUCTION

A rating or scoring system that utilize a mathematical numeric grading system to a patient's occlusion/malocclusion is known as orthodontic index.[1] There are various orthodontic indices to access orthodontic treatment need,[2-5] but index of orthodontic treatment need (IOTN) was found to be useful in epidemiological studies for comparing the orthodontic therapy need in various population groups and was also found to be suitable for orthodontic diagnosis and planning orthodontic resources.[6] The IOTN, PAR and the index of complexity, outcome, and need (ICON) are perhaps the most commonly used orthodontic indexes.[7-10]

As per Jamion, there are certain requirements of any ideal orthodontic index. Index should be quick, simple, reliable and reproducible. Furthermore, index should be objective, can score various handicapping and non-handicapping orthodontic conditions, amenable to any later modifications and can be applied easily on patients clinically or also on study models.

After the introduction of PAAR index, soon it came to know that there are certain shortcomings of PAR index, namely; Validity in UK population only, high weightings of horizontal overlapping of incisors, hypersensitive to malocclusion with increased horizontal overlapping of incisors, low weightings to vertical overlapping of incisors, and no scoring for displacements, gummy smile and facial profiles.[11-13]

To address the shortcomings of PAR, the ICON index[10] was developed by merging views of 97 specialist orthodontists from different countries of the world especially europe.[14,15] Even after introduction of ICON index, certain limitation were later detected. To counter shortcomings of ICON and PAR index, the Index of Orthodontic Treatment Need (IOTN) was introduced by Brook and Shaw to form a more valid and reproducible index of orthodontic treatment priority.[16] The IOTN index consists of two portions, the Aesthetic part and the Dental Health part.[17] The IOTN index is unique in incorporating aesthetic score as integral part of the assessment of orthodontic need.[17] IOTN Health component grades are as follows:[16]

- D-IOTN grade 1=no need for orthodontic therapy
- D-IOTN 2= little need
- D-IOTN 3= borderline need
- D-IOTN 4=great need
- D-IOTN 5=very great need for orthodontic therapy

Keeping in mind the fact that there are very few public sector orthodontic centres in Punjab, D-IOTN can be applied to the patients visiting these dental care institutes, so that patients with definitive treatment need get treatment on priority basis. Therefore this cross sectional study was designed to apply the D-IOTN in Pakistani population visiting Orthodontic centres of Faisalabad medical university and de'Montmorency College of dentistry, to assess need of orthodontic therapy.

METHODS

Study Design

Cross sectional study

Setting and Duration

Orthodontic centres, Faisalabad medical university and de'Montmorency College of Dentistry. From 1.3.2017 to 1.10.2017

SELECTION CRITERIA

Inclusion Criteria

Permanent dentition fully erupted except 8s
Age range of 12 and 18
Patient willing to take part in current study

Exclusion Criteria

Any history of orthodontic therapy
Any Craniofacial conditions
TMJ issues

Data Collection Procedure

Current study was conceived at the centre of Orthodontics of our institutes. 200 subjects were included as per above mentioned selection criteria. D-IOTN was evaluated in every patient by one expert orthodontist. Clinical intraoral examination was done to find out the need of orthodontic therapy, by seating the patient on dental chair under optimal dental lighting. The intraoral examination was done for missing teeth, clefts of lip and maxilla, impeded tooth eruption and sagittal molar relationship. Vernier calliper was used to measure the horizontal and vertical overlapping of incisors, transverse cross bite and displacement of incisal or posterior segments of arch. Findings were collected and recorded on a predesigned D-IOTN Performa. Scoring was done as follows:[16]

- D-IOTN grades 1 represented no need for orthodontic therapy
- D-IOTN 2 represented little need
- D-IOTN 3 represented borderline need
- D-IOTN 4& 5 represented definitive need

Statistical Analysis

The kappa statistics were applied to find out the intra and inter-examiner reliability. The mean age and gender distribution was calculated. Mean and Standard Deviation for the age of the subjects for D-IOTN grades was calculated.

Chi-square test was applied to find out the distribution of D-IOTN grades as per gender and gender comparison was done. The P value less than or equal to 0.05 was declared as statistically significant. The data analysis was done using SPSS 20.0.

RESULTS

The mean age of 200 subjects was 16.11±2.33 years.
The sex distribution was 60% females (16.19±2.31) and 40% (17.11±2.43) males. (Table-I)

Parameter	Results
Mean Age	16.11±2.33 Years
Males	80 (40 %)
Females	120 (60 %)

Table-I. Age and sex distribution. (n=200)

Results showed that 68% needed definite orthodontic therapy, 16 % needed borderline orthodontic therapy, while 16 % were scored as in need of little or no orthodontic therapy. D-IOTN score results showed 15% (Grade 5), 53% (Grade 4), 16% (Grade 3), 14% (Grade 2) and 2% (Grade1). (Table-II)

Grades	% of Patients
Very great Treatment Need	15%
Great Treatment Need	53%
Borderline Treatment Need	16%
Little Treatment Need	14%
No Treatment Need	2%

Table-II. Results of D-IOTN. (n=200)

Out of 68% patients that required definite therapy, 55% were females and 45% were males. No significant gender difference was found for therapy need in any grade of D-IOTN. (Table-III)

		Definitive Treatment Need
		Yes (%)
Gender	Male	45%
	Female	55%
Total		100%

Table-III. Gender distribution in definitive treatment need group. (n=200)

DISCUSSION

The evaluation of need of orthodontic treatment by D-IOTN method is a key tool to assess need of any orthodontic population. Present study was conceived on 200 Pakistani patients. The sample for current study was not collected from general population group, but from orthodontic department of our institutes.

Results of current study showed that 68% were in definitive need of therapy, while 2% were found to be having no need of therapy. Results of present study can be compared with other availablestudies.[18-22] Zahid et al. in his study showed that 75% of the subjects were in definite treatment need category. Our results are in contrast to findings of Naeem et al. 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 IOTN. Difference in results can be linked to the fact that Naeem et al. used aesthetic component of IOTN index instead of D-IOTN used in present study.

In present study, out of 68% patients that needed definite therapy, 55% were females and 45% were males i.e. no statistically significant gender difference. This is in agreement with findings of study by Zahid et al. where no significant gender difference was found for therapy need. However results are in contrast with findings of another study by Zahid et al, where 36% of female patients and 41% of male patients were found to be in need of definite orthodontic care as per D-IOTN. Results are also in contrast with findings of Naeem et al. who found that 37 % of females and 52 % of males needed definite therapy. Our results are also in accordance to studies by Güray et al., Uur et al., Uncuncu and Souames, who showed insignificant difference among males and females for treatment need.[23-26]

Firestone et al concluded similar results in their study, in which 14.3% patients were found to be in moderate care need and 81.6% in great care need. A study conducted in Turkish population by Ucuncu concluded that 12.0% patients were in need for moderate care need and 83.2% for great care need.

There are various orthodontic indices available such as IOTN, PAR, ICON and dental disability index. All these indices are good epidemiological tools for assessing and scoring treatment need in any population group.[27-29] These indices can also be utilized for diagnosis, treatment planning, prognosis of orthodontic malocclusions and planning orthodontic disease control programmes. Keeping in mind the fact that there are very few public sector orthodontic centres in Punjab, D-IOTN can be applied to the patients visiting these dental care institutes, so that patients with definitive treatment need get treatment on priority basis. This is similar to the Schanschieff report on H-IOTN which was

applied in NHS in UK, to avoid unnecessary therapy of mild orthodontic subjects and H-IOTN was also found to be a helpful sieve in allocating orthodontic care in a fair and transparent way.[30-34]

It is necessary to point out certain shortcomings of current study i.e. small sample size, short study duration, and sample is representative of only two orthodontic centres of Pakistan. However, in presence of certain shortcomings still present study provided useful data regarding needs of orthodontic patients in Pakistani population. Future large scale studies are suggested with improved methodology and longer study duration.

CONCLUSION

- A high number of Pakistani patients were in need of the orthodontic therapy
- 68% needed definite orthodontic therapy, 16 % needed borderline orthodontic therapy, while16 % were scored as in need of little or no orthodontic therapy
- No significant gender difference was found for therapy need in any grade of D-IOTN

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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1	Muhammad Azeem	Data recording and analysis, Written the manuscript.	
2	Aqeel Ahmad	Data recording and analysis.	
3	Arfan ul Haq	Critically reviewed the manuscript.