

INDEX OF COMPLEXITY, OUTCOME AND NEED (ICON) FOR DETERMINING TREATMENT NEED IN PAKISTANI ORTHODONTIC PRACTICE

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ABSTRACT

Assessment of orthodontic treatment need is a complicated issue. Taking decision of whether or not one should undergo orthodontic treatment, both the desire of the patient (and/ or parents) and the opinion of the orthodontist must be taken into account. The aim of present cross sectional study was to apply Index of Complexity, Outcome and Need (ICON) in Pakistani population. Dental casts of 50 patients were used and analyzed by applying ICON to find out the orthodontic treatment need and initial stage complexity grades. The data was analyzed in Statistical Package for the Social Sciences software package (SPSS) 21. Results showed that 80% of the patients needed some sort of orthodontic therapy. More than 65% of the cases were classified as being difficult and very difficult to treat. It was concluded that a high number of cases were in need of the orthodontic therapy and majority of the patients undergoing orthodontic treatment were in difficult grades.

Key Words: *Index of Complexity Outcome and Need; Index of Orthodontic Treatment Need.*

INTRODUCTION

Orthodontic index can be described as- A rating or scoring system which assigns a mathematical numeric grade to a patient's occlusion.¹ Several orthodontic indexes have been proposed to find out orthodontic treatment need and to score complexity of patient's malocclusion.²⁻⁷ The index of orthodontic treatment need (IOTN), PAR and the index of complexity, outcome, and need (ICON) are perhaps the most commonly used orthodontic indexes.⁸⁻¹⁰

However there are certain shortcomings of PAR index and the IOTN,¹¹⁻¹³ namely insignificant correlation between indices, contradictory findings, valid in UK only, undue lenient for end treatment spaces, no

scoring for incisor inclination and rotations, and not grade difficulty of treatment.

To address the shortcomings of IOTN and the PAR index, the ICON¹⁰ was developed by merging views of 97 orthodontists from different European countries and the USA. ^{15,16} ICON has been shown to be a reliable and valid index for assessing orthodontic treatment need. ^{17,18} The index is intended for use in the late mixed dentition and permanent dentition. Further, the index may be applied clinically to cases and to plaster models without any modification. The ICON is unique in incorporating aesthetic score as integral part of the evaluation of treatment need.¹⁹ ICON complexity grades (Score range) are as follows¹⁰:

Easy	<29
Mild	29 to 50
Moderate	51 to 63
Difficult	64 to 77
Very difficult	>77

This cross sectional study was designed to apply Index of Complexity, Outcome and Need (ICON) in Pakistani population to assess treatment need and complexity grades, among the patients visiting department of Orthodontics, de, Montmorency College of dentistry, Lahore, Pakistan.

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METHODOLOGY

This cross sectional study was conducted at the Department of Orthodontics, de, Montmorency College of Dentistry, Lahore in which orthodontic records of 50 untreated patients, between the chronological ages of 12 and 16 years, irrespective of gender were included. Duration of this study was from November 2016 to June 2017.

Inclusion Criteria: All teeth present except wisdoms, orthodontic patients with chronological ages of 12 to 16 years, and good quality pre-treatment models.

Exclusion Criteria: Previous orthodontic / Orthognathic treatment, craniofacial syndromes and patients with TMJ problems.

Dental casts of 50 patients were used and analyzed by applying ICON to find out the orthodontic treatment need and initial stage complexity grades.¹⁰

The data were analyzed in Statistical Package for the Social Sciences software package (SPSS) 21. The mean age and gender distribution among the selected sample was calculated. For Intraexaminer reliability, 10 dental casts were randomly selected from the main sample and were reassessed 10 days after the initial assessment, and found out to be reliable.

RESULTS

The mean age of the patients was 14.18 years. The sex distribution was 20 males and 30 females. The mean age of male patients was 14.11 years and mean age of female patients was 14.13 years. (Table 1)

Forty study casts (80%) were found to be in need of orthodontic treatment, while 10 (20%) were found to be having no need of orthodontic treatment. It was found that, out of 30 females 23 needed orthodontic treatment and 7 were found, having no need of treatment. 17 males were found to be in need of orthodontic treatment and 3 were found, having no need of treatment. (Table 2)

As far as the orthodontic pre-treatment complexity grade is concerned, maximum number of cases 35% were

TABLE 1: AGE AND SEX DISTRIBUTION (N=50)

Parameter	Results
Mean Age	14.18 Years
Males	20 (40 %)
Females	30 (60 %)

TABLE 2: RESULTS OF TREATMENT NEED (N=50)

		Treatment Need		Total
		Yes	No	
Gender	Male	17	3	20
	Female	23	7	30
Total		40	10	50

TABLE 3: RESULTS OF TREATMENT COMPLEXITY GRADES (N=50)

Complexity Grade ¹⁰	% of patients
Easy <29	5
Mild 29 to 50	5
Moderate 51 to 63	25
Difficult 64 to 77	30
Very difficult >77	35

classified as having very difficult orthodontic treatment (ICON score > 77). 5% cases in easy treatment grade (ICON score < 29), 5% cases in mild treatment grade (ICON scores from 29 to 50), 25% in moderate treatment grade (ICON scores from 51 to 63), and 30 % in difficult treatment grade (ICON scores from 64 to 77). (Table 3)

DISCUSSION

Advantages of grading complexity of occlusion are: (I) Identification of the most proper clinical setting in which orthodontic patient receives therapy (II) Information to the patient regarding orthodontic therapy success chances, and (III) grade cases according to difficulty.¹⁰

The ICON consists of five components: The Aesthetic Component which is similar to the Aesthetic Component of the IOTN, upper and lower crowding and or spacing, the presence or absence of X bite, grading of overbite, and the saggital fitness of the posterior teeth.¹⁰

Results of present study showed that 80% were in need of orthodontic treatment, while 20% were found to be having no need of orthodontic treatment. It was found that, out of 30 females 23 needed orthodontic treatment and 17 males were found to be in need of orthodontic treatment. As far as the orthodontic pre-treatment complexity grade is concerned, maximum number of cases i.e. 65% were classified as having difficult and very difficult orthodontic treatment grades.

Results of present are study higher than other studies in Jordan (28%), Kuwait (28%), United Kingdom (32%), New Zealand (31.3%), Malaysian (47.9%) and Chinese (52%) populations. Contrary to our findings, some African studies, reported much lower estimates for Nigerian (13%) and Tanzanian children (22%).²⁰⁻²⁷ However our results are in agreement with other local studies.^{28,31} The limitation of this study is small sample size; further large scale studies are suggested.

CONCLUSION

It was concluded that, according to ICON, a high number of cases were in need of the orthodontic therapy and majority of the patients undergoing orthodontic treatment were in difficult grades.

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CONTRIBUTIONS BY AUTHORS

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| 1 Muhammad Azeem: | Conceived and designed the study, data recorded, analysed and interpreted the data. |
| 2 Muhammad Burhan Hayat: | Wrote and critically reviewed the manuscript. |
| 3 Muhammad Imran Khan: | Statistical analysis and interpretation of data. |
| 4 Waheed ul Hamid: | Main supervisor, critically reviewed the manuscript & did final editing |