

RELIABILITY OF PAR AND IOTN INDEICES IN NORTH EAST INDIAN POPULATION: A PILOT STUDY

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ABSTRACT

Background: rationale behind of this study was to evaluate the severity of malocclusion in north East Indian populations in relation to know what types of malocclusion and associated orthodontic treatment need. **Methods:** this study was carried out in north East Indian populations (the department of orthodontics, Mansarovar dental college kolar road Bhopal madhyapradesh state India). Study models were collected from department store, sum of 93 pre treated study models were collected. (Age, 16-24 years). The peer assessment rating (PAR) index was used to determine the severity of their malocclusions. To treatment need assessed by the dental health component (DHC) and the esthetic component (EC) of the index of orthodontic treatment need. **Results:** The mean PAR scores were 17, 29, 21, and 19 for Class I, Class II Division 1, Class II Division 2, and Class III, respectively. A statistical value concludes that the mean and median PAR scores of Class II Division 2 malocclusions were significantly higher than the other types of malocclusion (P .005). In comparison with PAR index value with IOTN index, it reports that the treatment need group is much greater than no treatment need. **Conclusions:** This study was concluded that the north East Indian population's posses Class II malocclusions to be more significant than other two class of malocclusion. Furthermore, PAR score seemed very high in class II division 2 malocclusion, as compare to class I and III.

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INTRODUCTION

PAR index can be used as best tool to diagnose orthodontic treatment outcome. Several investigators have been accepted, applied and suggested that the peer assessment rating (PAR) index is valid tool to assess the severity of malocclusion and its treatment outcome PAR index evaluate the practitioner's capability along with epidemiological survey. Hence this PAR index is used as tool in this study [1]. The utility of occlusal indexes is to scrutinize, research, decision making, and assessing orthodontic treatment need and outcome is well accepted worldwide. The peer assessment rating (PAR) index was to provide appropriate summary score for occlusal anomalies and to evaluate approximate deviation of a malocclusion from normal alignment and occlusion [2]. Scores of PAR index and orthodontic treatment need index were found significantly co-related. However with exception UK, US, score of PAR index, few recent studies evaluated that with cutoff score of 17 as optimal points, can be used for decision making of orthodontic treatment need [2-5]. Various types of orthodontic indexes have been projected to provide information on the prevalence of malocclusions and independently enumerate the severity of the various features of malocclusion. The index of orthodontic treatment need (IOTN) and PAR index [3]. ORTHODONTICS treatment need index composed of dental health component (DHC) and esthetic component (EC) [4]. Thus the scores of this index guide us to evaluate the occlusal trait and dental, esthetic health impairment. The recommended cutoff scores that establish treatment need are DHC grades 4-5 and EC grades 8-10, as the validity and reliability of PAR index is very high all the time [5-6]. Few current studies have been concluded that more than 63% samples were untreated, had a definite need of orthodontic treatment [7]. However due less knowledge of orthodontic treatment many of patients are unaware of esthetic relation with orthodontic treatment [6-8]. The important rationale behind of this study was to evaluate the severity of malocclusion in Bhopal population in relation to know what types of malocclusion and associated orthodontic treatment need. With the help of PAR and treatment need index.

MATERIAL AND METHODS

The sample for this study was carried out in north East Indian populations. Study models were collected from department store, sum of (n=93, age 16-14) pre treated study models were collected. Before collecting study cast thorough case history was taken in to consideration.

Inclusive criteria were no history of orthodontic treatment, serial extractions, and craniofacial anomalies. Type of malocclusion was defined according to the British Standard Institute Incisor Classification.

Study model analysis were done by trained post-graduate students of the department and based on score obtained severity of malocclusion was evaluated using PAR and IOTN index , by single examiner guide by me , calibrated for both.

Sample were divided into two groups and analysis were done, to avoid error two week later model analysis were repeated and mean value was taken. Based on value obtained treatment need grouped in to two group

1. No treatment need (DHC,1-3;EC1-7)
2. Treatment need (DHC, 4-5; EC, 8-10)

Statistical analysis

Intraexaminer scores were assessed for the PAR, ANOVA statistical analysis was used, and the kappa statistic was used to evaluate intraexaminer scores for DHC and EC assessment. Appropriate statistical analysis was used to evaluate the PAR scores to differentiate the types and severity of malocclusion.

T test was used to evaluate the accuracy in PAR score, to differentiate between the no-treatment-need and treatment-need groups for dental health or esthetic impairment were assessed. Note that the statistical was set ($P < 0.05$) and possible statistical analysis were performed with help of SPSS software also used.

RESULTS

Inspection of the intra-examiner agreement of two post graduates resulted in the exclusion of two. The inter-examiner agreement (ICC) was 0.90 and the ICC for the intra -examiner-agreement ranged from 0.60 to 0.86. For each case the mean clinical sense determined by two inters and intra examiners were compared with their mean indicated treatment point, which were 4.43. When this value was more than or equal to 4.43, the case was labelled as 'Treatment need'. The others were labelled as 'no treatment need' [Supplementary Table-1, Supplementary Figure-1].

The examiner agreement (PAR) score ranged for the intra-examiner agreement from 0.33 ($P > 0.05$) to 0.58 these score indicates acceptable with assessment of student T test, table number 1. Clarify the detail score of PAR and for class I, II division1, division 2, and III malocclusion.

The inter-examiner agreement (IONT) score ranged for intra-examiner from 0.02 ($P > 0.05$) to 0.49. These results are low due to the high prevalence of scores above 4.43. From obtained values mean and median PAR scores of Class II Division 2 malocclusions were significantly higher than the other types of malocclusion ($P .005$). In comparison with PAR index value with IOTN index, it reports that the treatment need group is much greater than no treatment need [Supplementary Table-2, Supplementary Figure-2].

DISCUSSION

Scores of PAR index reveals that the most of north East Indian populations can be categorized under treatment need section [7]. Furthermore, class II division 2 clears that PAR score highest among the three classes of malocclusion [8]. These results suggest that Class II malocclusions in north East Indian populations have more occlusal-traits and treatment need than Class I or Class III malocclusions [9]. With reference table II, clears that the treatment need group can be categorized with higher score than treatment not needed. This becomes significantly clear when we compare Supplementary Table-2, Supplementary Figure-2 [10]. Significant relationship between malocclusion severity and level of treatment need was found ($P < .001$).

The existence of low PAR score in treatment need group still suggestive of potential dental-health impairment [11]. Second important factor can be seen in study models which delaying the patient to treatment although they were in treatment need group was presence of deciduous teeth which they were maintaining the Overjet, occlusal traits [9-11].

Treatment need index divide in to dental health and esthetic component, but A patient with a mild Class I malocclusion with unilateral posterior crossbite of at least 1 tooth with functional shift might have acceptable esthetics despite the potential for compromised dental health [11]. This could be the rationale behind that most of the Bhopal populations under the group of treatment need, but still most of them were not perusing treatment. However, their apical radiographs reveal that they in high PAR score index [7-12]. Most of the previous studies have used PAR score as key factor in decision making with cutoff values of 17 score, and 21 PAR for esthetic impairments. Furthermore, those studies have agreed and accepted the PAR and IOTN scores [9-11].

The study carried out by me in department, could be directly compared with the PAR; still we have achieved the similar results. We found that PAR 17 was the optimum cutoff for presumed compromised dental health, and PAR 21 for esthetic impairment [7-11]. However, considering the optimum cutoff PAR values need not be always similar to decided treatment needed, because it might not be necessarily identical with dental health and dental esthetic [5-12]. Most of the recent studies were using index of complexity, key values for treatment outcome and esthetic evaluation. Thus it's always advice and suggestive of replacement of PAR and IOTN indices for current status and results of Bhopal population.

CONCLUSION

This study was concluded that north East Indian populations' possess Class II malocclusions to be more significant than other two class of malocclusion. Furthermore, PAR score seemed very high in class II division 2 malocclusion, as compare to class I and III. In treatment need group PAR score were significantly higher than those with borderline or no treatment need cadre. PAR index hold best for esthetic component then dental health need.

CONFLICT OF INTEREST

The author declares having no competing interests.

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REFERENCES

- [1] Jen Soh, Andrew Sandham, and Yiong Huak Chan. [2005] Malocclusion severity in Asian men in relation to malocclusion type and orthodontic treatment need; *Am J Orthod Dentofacial Orthop*; 128:648-652.
- [2] DeGuzman L, Bahiraei D, Vig KWL, Vig PS, Weyant RJ, O'Brien K. [1995] The validation of the Peer Assessment Rating index for malocclusion severity and treatment difficulty. *Am J Orthod Dentofacial Orthop*; 107:172-176.
- [3] McGorray SP, Wheeler TT, Keeling SD, Yurkiewicz L, Taylor MG, King GJ. [1999] Evaluation of orthodontists' perception of treatment need and the peer assessment rating (PAR) index. *Angle Orthod*; 69:325-333.
- [4] Firestone AR, Beck FM, Beglin FM, Vig KW. [2002] Evaluation of the peer assessment rating (PAR) index as an index of orthodontic treatment need. *Am J Orthod Dentofacial Orthop* 122: 463-469.
- [5] Brook PH, Shaw WC. [1989] The development of an index of orthodontic treatment priority. *Eur J Orthod*; 11:309-320.
- [6] Beglin FM, Firestone AR, Vig KW, Beck FM, Kuthy RA, Wade D. [2001] A comparison of the reliability and validity of 3 occlusal indexes of orthodontic treatment need. *Am J Orthod Dentofacial Orthop*; 120:240-246.
- [7] Shaw WC, Richmond S, O'Brien KD, Brook P, Stephens CD. [1991] Quality control in orthodontics: indices of treatment need and treatment standards. *Br Dent J*; 170:107-112.
- [8] Cooper S, Mandall NA, DiBiase D, Shaw WC. [2000] The reliability of the Index of Orthodontic Treatment Need over time. *J Orthod* 27:47-53.
- [9] Phillips C, Griffin T, Bennett E. [1995] Perception of facial attractiveness by patients, peers and professionals. *Int J Adult Orthod Orthognath Surg*; 10:127-135.
- [10] British Standard Institute. British Standard Incisor Classification. Glossary of Dental Terms BS4492. London: British Standard Institute; 1983.
- [11] Kerr WJS, O'Donnell JM. [1990] Panel perception of facial attractiveness. *Br J Orthod* 17:299-304.

[12] Soh J, Sandham A. [2004]Orthodontic treatment in Asian adult males. *Angle Orthod*;74:767-771.

SUPPLEMENTARY INFORMATION (As supplied by authors)

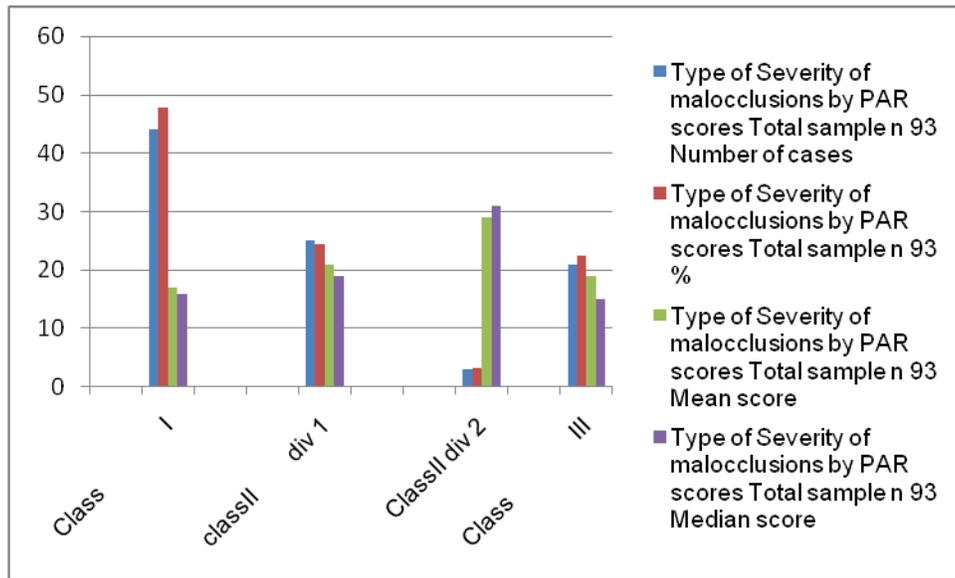
Supplementary Table-1

Type of Malocclusion	Severity of malocclusions by PAR scores Total sample n 93			
	Number of cases	%	Mean score	Median score
			SD	
Class I	44	47.8	17	16
ClassII div 1	25	24.5	21	19
ClassII div 2	03	3.2	29	31
Class III	21	22.5	19	15

Supplementary Table-2

Type of malocclusion		Treatment need N=93					
		%			%		
		DHC 1-3	DHC 4-5	P value	EC 1-7	EC 8-10	P value
Class I	44	55	41	0.081	73	21	0.080
ClassII-1	25	41	55		65	29	
ClassII-2	03	34	62		42	52	
ClassIII	21	41	55		62	30	

Supplementary Figure-1



Supplementary Figure-2

