

To Evaluate the Orthodontic Treatment, Need and Cosmetic Component of the Index of Orthodontic Treatment Need (IOTN) in School Children

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Conflict of interest: Nil

Abstract

Aim: To evaluate the orthodontic treatment requirements in Indian school children by using the cosmetic component of the Index of Orthodontic Treatment Need (IOTN).

Material and Methods: The present retrospective study was conducted in the Department of Dentistry, Patna Medical College and Hospital, Patna, Bihar, India during January 2019 to December 2019. The age group for selection was 6-12 yrs with mixed dentition. There was a selection criterion which was to be followed. The inclusion criteria were, Children with mixed dentition. Those children who were not having any history of previous orthodontic treatment were included in the study. After all the inclusions and exclusions total 400 subjects were examined (202 boys and 198 girls) Examination was done by a single operator by checking the aesthetic view of the samples and comparing them with set of ten colour photographs showing different levels of dental attractiveness i.e. SCAN -A Standardized Continuum of Aesthetic Need Scale popularly known as "SCAN". Thus, the aesthetic view was examined and marked according to the aesthetic view in SCAN Index.

Results: Of the studied subjects (400) 103 subjects were having their aesthetic view as type 7 of the scan index which was the highest followed by 58 subjects having their aesthetic view as type 5 of the scan index. Need of treatment Borderline (51.25%) Boys =54.63% , Girls =45.36% Immediate (21.75%) Boys=49.42%and Girls=50.57%

Conclusion: The threshold for borderline values should be reduced. The demarcation between the absence of treatment need and the presence of treatment necessity should be clearly defined. Even though, the Index of Orthodontic Treatment Need may not be an ideal one, but this index could be considered as good malocclusion index, since it fulfils some of criteria of good index as stated by Young and Striffler. The examination only takes less than one minute if the malocclusion is not too complicated.

Keywords: Index of orthodontic treatment needs, A Standardized continuum of aesthetic need scale, Malocclusion

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Introduction

Maintenance of good health is of prime importance to any individual. Oral health is one of the important component of a healthy life. For orthodontic treatment to become an integral part of oral health care programs, basic information on treatment needs is required. Developing countries like India has also shown an increase in demand for orthodontic treatment as people are becoming more aware about oral health conditions and subsequent care available. Logical planning of orthodontic treatment on population basis is important. Patient with treatment need should be addressed first and while those with little need can be protected from unnecessary intervention. The Occlusal Index [1] the Treatment Priority Index [2] assess malocclusion but do not take the soft tissue profiles or facial asymmetries

into account. The Swedish Dental Society and the Swedish Medical Board. [3] developed an index which classified malocclusion into grades but these grades were not well-defined and the cut-off points were somewhat vague. [4] Brook and Shaw in 1989 [5] introduced the Index of Orthodontic Treatment Need which categorises malocclusion into distinct categories of treatment need and also includes a measure of function. [6] The IOTN incorporates both a dental health component and an aesthetic component. The DHC represents biological or anatomical aspects of IOTN that records need for treatment on dental health and functional grounds. The AC measures aesthetic impairment and justifies treatment on social-psychological grounds.

Grade 5 (very great)	Increased overjet > 9 mm Extensive hypodontia with restorative implications (more than one tooth missing in any quadrant) requiring pre-restorative orthodontics. Impeded eruption of teeth (with the exception of third molars) due to crowding, displacement , the presence of supernumerary teeth, retained deciduous teeth and any pathological cause Reverse overjet greater than 3.5mm with reported masticatory and speech difficulties Defects of cleft lip and palate Submerged deciduous teeth
Grade 4 (great)	Increased overjet > 6 mm but ≤ 9 mm Reverse overjet > 3.5mm with no masticatory or speech difficulties Anterior or posterior crossbites with > 2 mm discrepancy between retruded contact position and intercuspal position Severe displacement of teeth > 4mm Extreme large or anterior open bites > 4 mm Increased and complete overbite with gingival or palatal trauma Less extensive hypodontia requiring pre-restorative orthodontics or orthodontic space closure to obviate the need for prosthesis Posterior lingual crossbite with no functional occlusal contact in one or both buccal segments Reverse overjet greater than 1 mm but ≤ 3.5 mm with recorded masticatory and speech difficulties Partially erupted teeth, tipped and impacted against adjacent teeth Supplemental teeth
Grade 3 (borderline)	Increased overjet > 3.5 mm but ≤ 6 mm with incompetent lips Reverse overjet greater than 1 mm but ≤ 3.5 mm Anterior or posterior crossbites with ≤ 1 mm discrepancy between retruded contact position and intercuspal position Displacement of teeth > 2 mm but ≤ 4 mm Lateral or anterior open bite > 1 mm but ≤ 2 mm Increased and complete overbite without gingival or palatal trauma
Grade 2 (little)	Increased overjet > 3.5 mm but ≤ 6 mm with competent lips Reverse overjet > 0 mm but ≤ 1 mm Anterior or posterior crossbites with ≤ 1 mm discrepancy between retruded contact position and intercuspal position Displacement of teeth > 1 mm but ≤ 2 mm Anterior or posterior open bite > 1 mm but ≤ 2 mm Increased overbite ≥ 3.5 mm without gingival contact Prenormal or post normal occlusions with no other anomalies. Includes up to half a unit discrepancy
Grade 1 (none)	Extremely minor malocclusions including displacements < 1 mm

Material and methods

The present retrospective study was conducted in the Department of Dentistry, Patna Medical College and Hospital, Patna, Bihar, India during January 2019 to December 2019. The age group for selection was 6-12 yrs with mixed dentition. There was a selection criterion which was to be followed. The inclusion criteria were, Children with mixed dentition. Those children who were not having any history of previous orthodontic treatment were included in the study. While the exclusion criterion for the study was the subjects with any craniofacial anomalies and those children who did not give informed parents concern.

After all the inclusions and exclusions total 400 subjects were examined (202 boys and 198 girls)

Examination was done by a single operator by checking the aesthetic view of the samples and comparing them with set of ten colour photographs showing different levels of dental attractiveness i.e. SCAN -A Standardized Continuum of Aesthetic Need Scale popularly known as "SCAN". Thus, the aesthetic view was examined and marked according to the aesthetic view in SCAN Index.

Results

Of the studied subjects (400) 103 subjects were having their aesthetic view as type 7 of the scan index which was the highest followed by 58 subjects having their aesthetic view as type 5 of the scan index

The detailed results are as follow

Table 1:

Types	Boys	Girls	Total
Type 1	9	5	14
Type2	8	9	17
Type3	18	20	38
Type4	12	27	39
Type5	36	20	56
Type6	51	53	104
Type7	25	20	45
Type8	13	15	28
Type9	21	20	41
Type10	9	9	18

Grading Pattern

The grading pattern of the aesthetic index is divided as following

Type-1, Type-2, Type-3, Type-4

= these subjects require no need of treatment

Type 5-type7 = these subjects are inn borderline need of treatment

Type 8-type10 =these subjects are in immediate need of treatment.

Results

When the results of study were distributed according to grading pattern of treatment needs it was found that

Grading Pattern

1. 1-4 No need of treatment
2. 5-7 Borderline
3. 8-10 Immediate Treatment

Table 2:

Gender	Borderline Treatment Need (51.25%)	Immediate Treatment Need (21.75%)
Boys	54.63%	49.42%
Girls	45.36%	50.57%

Discussion

Different countries have adopted varying methods of funding orthodontic care for children. In countries that embrace the principle of publicly funded orthodontic care for all children with high objective need, reliable population data are required to evaluate the effectiveness of the orthodontic services. [7]

The SCAN scale was created on the basis of intraoral photographs of the dentition of 12-year-old children. Because of this in the present study, a group of mixed dentition was chosen. On other hand, previous studies carried out using the IOTN have indicated that assigning own dentition to the AC scale is a difficult task, particularly for younger patients. At the stage of mixed dentition the occlusion exhibits some characteristic traits which are reflected in the AC photographs. [8,9] The study shows that 73.00% samples need orthodontic treatment while 27% shows no need of orthodontic treatment. But according to study conducted by tulika wakhloo in Marathahalli, Bangalore 29.29% shows need for orthodontic treatment while 70.71% shows no need of orthodontic treatment. Comparatively, Nigerian (9%), Western Saharan (13.3%) & Tanzanian (13.8%) children had much lower orthodontic treatment need. [10-13]

The inconsistency between AC and DHC of IOTN could be clarified on the basis that dental features such as irregularly placed teeth in the lower arch, increased overjet, missing posterior teeth and impacted canines could not be figured on the anterior aspect of photos of AC which placed them in "no treatment need" category.

Conclusion

The threshold for borderline values should be reduced. The demarcation between the absence of treatment need and the presence of treatment necessity should be clearly defined. Additional research is necessary to see if an individual without specialized knowledge in Khed is capable of making an identical decision. Even though, the Index of Orthodontic Treatment Need may not be an ideal one, but this index could be considered as good malocclusion index, since it fulfils some of criteria of good index as stated by Young and Striffler. The examination only takes less than one minute if the malocclusion is not too complicated.

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