

Assessment of Need of Orthodontic Treatment in South Bhopal Population, India using Dental Health Component and Aesthetic Component of the Index of Orthodontic Treatment Needs for Providing Better Local Health Services to the Population with an Impact.

Abstract:

Aims & Objectives: Aim of the present study is to identify the most common types of malocclusion present in the area and categories the malocclusion according to severity and priority using IOTN as a reliable tool to provide better local health services.

Materials and Methods: Clinical examination of 500 subjects in natural light was done and intra oral photos of 500 subjects were taken. Assessment of orthodontic treatment needs for improving local health services using IOTN as a reliable epidemiological tool in subjects between 13 to 25 years of age group (13- 18 age group 240 subjects and 18-25 age group 260 subjects) to prioritize and standardize orthodontic treatment and needs. Out of these 279 are males and 221 are females. The study consists of a survey using indices of orthodontic treatment and needs (IOTN) with DHC and AC. DHC and AC were recorded separately, and were calculated only by using clinical examination and intra oral photography compared to the standard chart of IOTN.

Result: The DHC results in subjects were found to be distributed as follows 70 subjects in no need 228 subjects in little need, 97 subject in moderate or borderline needs, 56 subjects in severe needs, and 49 subjects in category of very severe needs for treatment

Conclusion: Our study reported that more than 40% of individual in the need category which might have if remained undiagnosed or not facilitated by the orthodontic treatment. This study provides a data on the need of orthodontic treatment in the chosen sample of south Bhopal population, INDIA for improving local health services to the population with an impact. Also we concluded that IOTN is simple, less time consuming and highly reproducible.

Keywords: Index of orthodontic treatment needs, orthodontic treatment need, aesthetic component, dental health component, epidemiological tool.

Introduction:

The facts that dental caries in India is the first most common dental disorder is a truism that needs no reiteration. Malocclusion is the second most common dental disorder especially in adolescent children and young adults.[1] Malocclusion affects the physiological and functional well-being of a person if not addressed for a long time. It could be a very important variable feature that mostly creates a negative impact on the self-esteem and behaviour patterns. It is also observed that in the modern times a majority of malocclusions develop postnatal as a result of various acquired and environmental causes. Therefore the assessment of malocclusion is mandatory for documentation if prevalence

and treatment needs in a specific population is to be determined. Therefore several orthodontic indices have been developed with the intention to categorize malocclusion accordingly to severity and treatment priority. Some of them

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Received : 28 May,2021, **Published :** 31 August, 2021

How to cite this article: Khan, F. Assessment of need of orthodontic treatment in south Bhopal population, India using Dental Health Component and Aesthetic Component of the Index of Orthodontic Treatment Needs for providing better local health services to the population with an impact. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 7(2):.58-63

Access this article online

Website: www.ujds.in	Quick Response Code 
DOI: https://doi.org/10.21276/ujds.2021.7.2.12	

are Summers Occlusal Index (OI) [2], Treatment Priority Index (TPI) [3], Index of Orthodontic Treatment and Needs (IOTN) [4,5,6,7],. The development of the IOTN index by Brooks and Shaw (1989) has gained great recognition and popularity worldwide as a method of assessing malocclusion in terms of significance of person's dental health and self-perceived aesthetic impairment. According to sources, IOTN is a reliable epidemiological tool that is simple and highly reproducible and less time consuming [5,8]. Therefore this study aims to assess the need of orthodontic treatment in south Bhopal population, to improve the local health services by bringing uniformity and standardization in the assessment. This also helps in prioritizing treatment[10]. The IOTN has two components.

- The dental health component (DHC)
- Aesthetic component (AC)

Aim:

To provide better local health services in south Bhopal population with an impact found by the use of IOTN reliable and highly reproducible epidemiological tool

Objective:

1. To evaluate and analyses orthodontic treatment need in children's as well as adults with permanent dentition in south Bhopal and to evaluate whether any of these needing orthodontic treatment have negative impacts on their oral health and quality of life.
2. To identify the most common type of malocclusion prevalent in the area and categorize them according to severity and priority so as to bring uniformity and standardization in assessment and treatment

Material and method:

This cross sectional study was done by the primary investigates for 500 subject willing to participate in the study. Clinical extra oral and intra oral examination of these subject were carried out in natural light and there intra oral photographs were taken. The inclusion criteria was of children's and adult both male and female with permanent dentition .The study was group were divided in two groups of 13 to 18 years & 18 to 25 years. The sample of 500 subjects was divided into 279 males and 221 females. DHC an AC were recorded separately and rating and grading were allocated separately for AC and DHC. Correlation of DHC

grades and AC grades was done for the sample. Before the clinical examination the participant were asked to answer the following questions.

S.NO	QUESTIONS	YES	NO
1	Whether he /she visited a dentist in past?		
2	Whether he/she needs a dental treatment?		
3	Whether he/she thinks their teeth are malaligned?		
4	If yes whether he /she visited the dentist for the same?		
5	If yes whether the dentist appointed an orthodontist or referred to an orthodontist for the same?		
6	Whether the consultation with orthodontist done or not?		

Before the clinical examination Informed consent for clinical examination and standard intra oral photographs was obtained and the intraoral examination was carried out by only one examiner (i.e. first author). Study was carried out over a period of 2 months Ratings and grading were allocated separately for AC and DHC.

Statistical analysis: The job of data entry, validity checks, and formation of desired results (as per the analysis plan) was done using the IBM SPSS version 22.0 (IBM Corporation, Statistical Package for the Social Sciences. N.Y., USA). Frequency in different categories were determined and were compared between males and females by using Chi Square test. P<0.05 was considered statistically significant.

Result:

The result of questioner were as follows:

1. Out of the 500 subjects none of them visited the dentist or orthodontist
2. 95% out of the total subjects were not aware of malocclusion & treatment possibilities though 70% of the subject had some or the other form of malocclusion.
3. The remaining 5% had aware about their malocclusion, affecting there aesthetics, function & their social image but were either denied treatment or were not aware of the treatment possibilities.
4. For children the questions were asked to the guardian, who reported that they are not aware of the malocclusion inspire of the fact that they had mild to moderate malocclusion present. Only patient with severe proclination were aware of the malocclusion present but they were not aware of the treatment possibilities. Therefore the survey helps in motivating the patients and bringing them for orthodontic treatment thus improving the local dental health services in the area.

The DHC results in the patients were found to be distributed as follows 70 subjects in no need 228 subjects in little need, 97 subject in moderate or borderline needs, 56 subjects in severe needs, and 49 subjects in category of severe needs for treatment. After evaluating the results showed that 450 subjects were placed in the category of no need or little need 15 subjects in moderate need and 35 in great needs category There was difference in need between males and females on the basis of DHC index with chi square value 22.95 and p value 0.01. The needs of the female was greater in comparison to male. (Table 1, Graph 1)

Table 2 shows the frequency distribution of the worst features of malocclusion that were identified in the sample and thus used to determine the DHC of the IOTN. The vast majority of the worst features were contact point displacements which were a result of crowding and increased overjet.

The AC results in the patients were found to be distributed as follows 24% no need, 35 % slight need, 31% moderate need, &10% definite need category. The males and females again show significant difference in need of treatment with male (8.24%) had definite need of treatment in comparison to 11.60% in females. (Table 3, Graph 2)

Chi-square tests of equality confirmed that the results for the IOTN DHC and AC

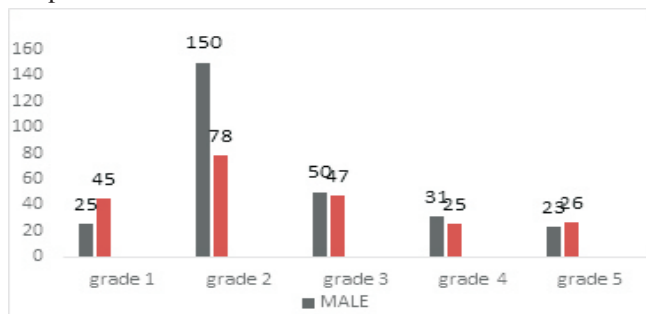
significant as χ^2 was 19.81 and 13.26 for males and females respectively. (Table 4, Graph 3)

TABLE 1 SHOWING DENTAL HEALTH COMPONENT OF IOTN INDEX

DHC	Treatment Needs	Male	Female	Total	χ^2 Value	P Value
Grade 1	No Need	25	45	70	22.95	0.001*
Grade 2	Little Need	150	78	228		
Grade 3	Borderline Need	50	47	97		
Grade 4	Need	31	25	56		
Grade 5	Great Need	23	26	49		

Chi Square test, *Significant

Graph 1:



Graph. 1: Showing DHC component of IOTN indeTable

2: Dental Health Component of IOTN (Treatment need from a dental health perspective)

DHC	Male	Female	Total
1	25	45	70
2a	46	17	228
2b	1	0	1
2c	1	0	1
2d	102	61	163
2e	0	0	0
2f	0	0	0
3a	15	11	26
3b	0	1	1
3c	1	1	2
3d	32	33	65
3e	1	0	1
3f	1	1	2
4a	8	5	13
4b	1	1	2
4c	1	0	1
4d	10	11	21
4e	0	0	0
4f	0	0	0
4h	3	2	5
4l	0	1	1
4m	7	4	11
4t	0	0	0
4x	1	1	2
5a	7	13	20
5h	11	9	20
5l	0	0	0
5m	5	4	9
5p	0	0	0
5s	0	0	0

TABLE 3: SHOWING AESTHETIC COMPONENT OF IOTN

Grades	Male	Female	Total	Need of Treatment	χ^2 test
1	25	45	70	NO NEED 23%	χ^2 value = 33.97 p value = 0.001*
2	36	13	49		
3	70	40	110	SLIGHT NEED 35 %	
4	44	25	69		
5	26	35	61	MODERATE NEED 30.6%	
6	31	27	58		
7	24	10	34	DEFINITE NEED 9.8% (Approx 10%)	
8	9	6	15		
9	11	12	23		
10	3	8	11		
Total	279	221	500		

Chi Square test, *Significant

Graph.2: Showing AC component of IOTN index

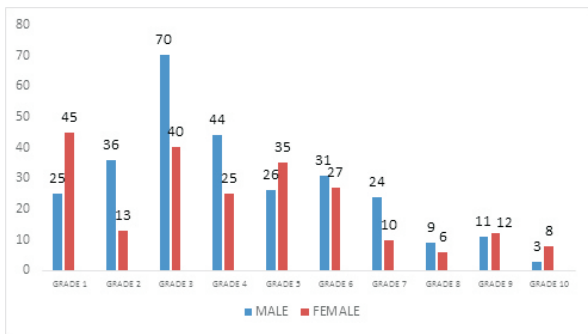
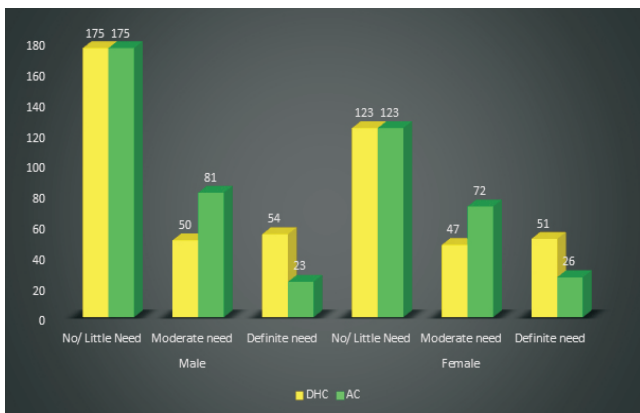


TABLE 4: Comparison of Orthodontic treatment needs in DHC and AC

Treatment Needs	Male			Female		
	No/ Little Need	Moderate need	Definite need	No/ Little Need	Moderate need	Definite need
DHC	175	50	54	123	47	51
AC	175	81	23	123	72	26
Chi square value	19.81			13.26		
P value	0.001*			0.012*		

Graph 4: Comparison of Orthodontic treatment needs in DHC and AC



These patients were screened through IOTN for very urgent need of treatment by the study.

CASE1:

A patient of age 24 having a chief complaint of forwardly placed teeth which was affecting his personality. Also on examination it was found that he was having open bite and has a tongue thrusting habit. Also he was found to be a mouth breather. Fig 1: frontal view at smile showing open bite Fig 2: intra oral view in frontal occlusal view



Fig. 1 & 2

CASE2:

A female of age 19 having a chief complaint of crowding with upper front teeth. On examination it was seen that she had a generalised attrition of teeth with severe sensitivity Fig 3: frontal view with smile showing crowding of upper anterior Fig 4: intraoral occlusal view showing crowding of upper anterior



Fig.3&4

CASE3:

A boy of age 14 with history of cleft lip and cleft palate. On examination irregularly placed upper anterior and malaligned teeth were found Fig 5: frontal view of oral cavity with smile showing malaligned teeth. Fig 6: intraoral view showing malaligned and some missing teeth with reverse overjet.



Fig.5&6

Discussion:

Our estimates of orthodontic treatment need, as were assessed by the DHC of the IOTN (49.3%). Maximum of adolescents and young adults should receive orthodontic treatment because of the associated health risks, aesthetics, functional, and psychosocial problems with malocclusion, but unfortunately, not many of them have access to such services. This is probably because of certain reasons, for example, specialist– orthodontists are not there and lack of resources – high cost and lack of materials and equipment. Also the

orthodontic concern is given a low priority in oral health-care system. In our study, the DHC scores were found as 14% individuals in no need, 45% individuals in little need, 19% individuals in moderate or borderline, 11% individuals in severe need, and almost 9% individuals were in the category of very severe need for treatment. Our study reported that more than 50% of individuals in the little need category, whereas Hedayati et al. (48.1%) and Nakas et al. (43%) reported that approximately half of the individuals were in the category of little need to treatment[17]. Grade 3 was in accordance with Nguyen et al.[17] study (21%) and Gudipaneni et al.[11] (29.6%).Uçüncü and Ertugay [16] found that 24% moderate need (Grade 3) and 2.8% very severe need (Grade 5)which is similar to our study. With regard to the distribution of AC - IOTN, 91% of the individuals showed no or little need (Grade 1–4). About 3% of the individuals showed moderate need (Grades 5–7) and 7% showed definitive need (Grades 8–10), respectively. The values for Grade 1–4 were satisfactorily in line with those values of Uçüncü and Ertugay [16] study(90.4%), Nakas et al.(92%), and Nguyen et al.(78%)[17]. Among this no or little need category 21% Grade 1, 24.5% Grade 2, 41% Grade 3, and 5% Grade 4 were included.Grade 1 and 2 values were in accordance with Uçüncü and Ertugay [16]and Hedayati et al., whereas Grade 3 values are in accordance with Hedayati et al. and Grade 4 value is not relating with any of the studies[15]. About 6.4% of study population showed great need for treatment.

Conclusion:

Our study reported that more than 40.40% of individual in the major needs category which might have if remained undiagnosed or not facilitated by the orthodontic treatment .This study provides a data on the need of orthodontic treatment in the chosen sample of south Bhopal population .for improving local health services to the population with an impact .Also we concluded that IOTN is simple less time consuming and highly reproducible. Similarly 59.60% of people are in little need of orthodontic treatment. In terms of treatment need, females were found to have higher levels of subjective treatment needs and demands than males. There was a “good” agreement between the subjects and the orthodontists.The knowledge on the orthodontic treatment need was only 28%. Sex wise distribution was male: 55.80% and female: 44.20%. According to DHC definitely need of treatment was 21%. According to AC definitely need of treatment was 40%.

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