

PERCEIVED NEED FOR ORTHODONTIC TREATMENT AMONG 10-18-YEAR-OLD PATIENTS AND THEIR PARENTS IN TANZANIA

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ABSTRACT

BACKGROUND: Parents tend to influence children's initiating orthodontic treatment. Thus, it is important to determine children's perceived need for treatment as it may differ from their parents' perception.

AIM: To assess the perceived dental aesthetics, determine the perceived orthodontic treatment need among patients, and compare it with their parent's perception.

MATERIAL AND METHODS: The study involved 10-18-year-old orthodontic patients and their parents attending the clinic. Data was collected through self-administered questionnaires for the patients and the parents for socio-demographic data and the Aesthetic Component (AC) of Index of Orthodontic Treatment Need (IOTN) index to assess dental aesthetics.

RESULTS: The patients were 10-18 years old with a mean age of 14 (+/-1.9 SD). More patients (68.2%) scored themselves in the 'No treatment need' category of the AC of the IOTN compared to parents (39.6%) who scored their children in this category. Moreover, parents' aesthetic scores were strongly associated with patient's perceived need for orthodontic treatment ($p < 0.001$).

CONCLUSIONS: The self-reported need for orthodontic treatment among the patients was lower than the need for treatment as perceived by their parents. Parent's perception of dental aesthetics significantly influenced the self-perceived need for treatment among the patients.

KEYWORDS: Orthodontics, Treatment need, Dentistry, Dental malocclusion

INTRODUCTION

Orthodontic treatment is mostly carried out in children and adolescents. More often than not, the decision to initiate and provide orthodontic treatment results from consultation between the parents/guardians and the orthodontist. Previous researchers have indicated that parents may recognize the need for treatment more clearly than children and be more motivated to encourage their children to undergo treatment than children themselves². However, in planning for orthodontic treatment, it is important to understand patients' perceptions of their malocclusion and aesthetic self-perception. However, it is how the patients view their malocclusion that usually determines their perception of the need and their desire to seek treatment^{3,4}. Some patients may be unbothered by a severe irregularity in their dental aesthetics, while others are concerned by what may be seen as a minor deviation⁵. Thus, this degree of perception of their malocclusion is a better predictor for the desire for treatment than the actual morphologic condition assessed by the professional⁹. Therefore, information about the patient's self-perceived need for treatment is a critical and necessary part of the treatment planning as they are the ones who undergo treatment and need to gain satisfaction from it⁶.

Thus, this study aimed to assess;

1. patient's perception of the need for orthodontic treatment and compare it with their parent's perception
2. patient's aesthetic perception of their dentition and compare it with their parent's perception
3. the relationship between the perceived need for orthodontic treatment and the patient's age and gender

METHODOLOGY

This questionnaire-based analytical cross-sectional study was conducted in the Orthodontic unit of the OPCD clinic at MUHAS School of Dentistry Hospital in the middle of Dar es Salaam City, Tanzania. Ethical clearance to conduct the study was obtained from the Senate Research and

Publications of the Muhimbili University of Health and Allied Science (MUHAS-REC-01-2023-1502).

The study involved all patients and parents presenting for orthodontic consultations or orthodontic treatment at the clinic between January and April 2023. It involved a total of 302 participants: 151 patients and 151 parents. Where two parents escorted the patient, only one parent was included in the research. All 152 participants filled out the self-administered questionnaire; however, some partially completed the questionnaire. Thus, some questions were not answered, leading to the exclusion of some non-response participants during the analysis of some variables and causing variation between the sample size and total number of participants analyzed in some variables.

After thoroughly explaining the aims of the study, parents who voluntarily agreed for their children to participate in the study signed an informed consent. In addition, assent was sought from the children; for those who agreed to participate, an assent form to be signed by the parent was provided.

A self-administered questionnaire was developed to collect data for the study and its subsequent analysis. Two separate questionnaires were used: a parent questionnaire filled out by the parent and a patient questionnaire filled out by the patient independent of the parent's supervision or input.

Each questionnaire comprised a section seeking the participant's socio-demographic data and the AC scale of the IOTN.

The Aesthetic Component (AC) is a scale of ten front-view photographs of the occlusion of anterior teeth. The photographs constitute a 10-point visual scale representing different levels of dental attractiveness, with grade 1 representing the most attractive and grade 10 the least attractive 7.

Using professional opinion as the 'gold standard,' cut-off points for the aesthetic need for orthodontic treatment were introduced as follows: grades 1 – 4 represent 'No Treatment Need,' grades 5 – 7 'Borderline Treatment Need,' and grades 8 – 10 'Great Treatment Need' ⁸.

Patients were asked to rate their self-perceived dental aesthetics by viewing the 10 AC photographs and choosing the most closely representing their dental appearance.

Parents were then asked to score their children on this scale by choosing the photograph resembling their child's dental appearance.

The participants were required to do the rating from memory without referral to a mirror and independent of each other.

Data was entered and analyzed using the statistical software IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

Perceived treatment needs was assessed by dichotomizing the AC scores into 'perceived need' comprising AC scores 1-7 and 'No perceived need' comprising AC scores 8-10.

Univariate analysis was done by drawing up frequency tables and obtaining the proportions for the parents and the patient. Bivariate analysis was done using the Chi-square test to check for the association between the outcome and independent variables. Fischer's exact test was used for variables with few counts. The level of statistical significance was set at $p \leq 0.05$.

RESULTS

This study involved 151 pairs of patients and their parents requiring orthodontic treatment at the paedodontic clinic of MUHAS.

Among the patients in the study, there was a higher proportion of females 93(64.1%) than males 52(35.9%). The mean age of the patients was 14 (+/-1.9 SD), with a majority of them being in the 13-15 age group 84(56%). Most parents accompanying the patients were female (73.1%) compared to the males (26.9%). (Table 1)

Table 1: Distribution of socio-demographic characteristics of the participants in the study (N=151)

Variable		n*	(%)
Patient			
Sex	Male	52	(35.9)
	Female	93	(64.1)
Age Group	10-12 years	29	(19.3)
	13-15 years	84	(56.0)
	16-18 years	37	(24.7)
Parent			
Sex	Male	39	(26.9)
	Female	106	(73.1)

** Variation between N and n in some of the items is due to the non-response of the participants*

Patient perceived orthodontic treatment needs.

Figure 1 shows the perceived orthodontic treatment needs of the patients and the parents' perception of this need according to the AC of the IOTN. A lower proportion of the patients reported treatment needs (12.6%) compared to the parents (27.5%).

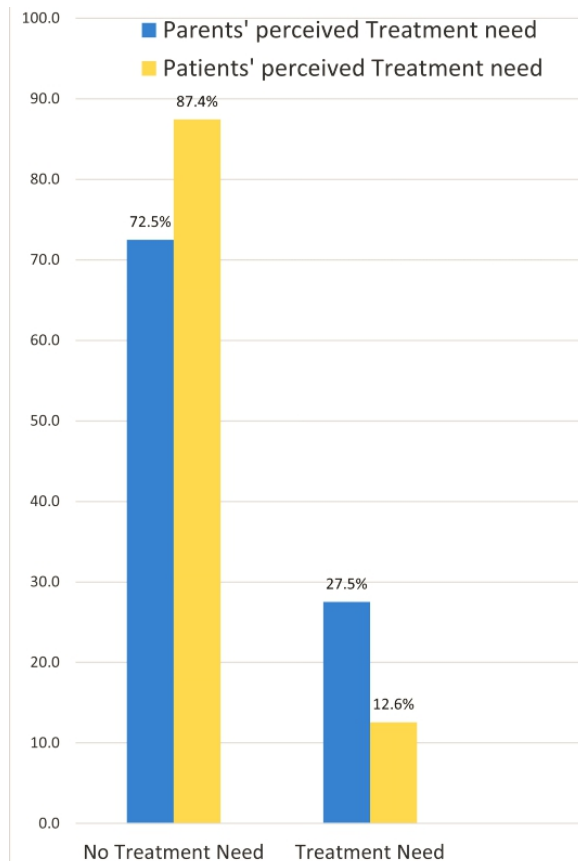


Figure 1: Comparison of parents' and patients' perceived orthodontic treatment needs according to the Aesthetic Component of the IOTN (N=151)

Perceived dental aesthetics among patients and parents Figure 2 compares the perception of dental aesthetics of the patients as scored by themselves and their parents. A significant proportion 102(68.2%) of the patients scored themselves in the "No treatment need" category compared to their parents 59(39.6%). In addition, more parents scored their children in the "Great treatment need" category (27.5%) compared to only 12.6% of the patients. 50(32.9%) of the parents and 30(19.2%) of the patients scored themselves in the "Borderline treatment need" category.

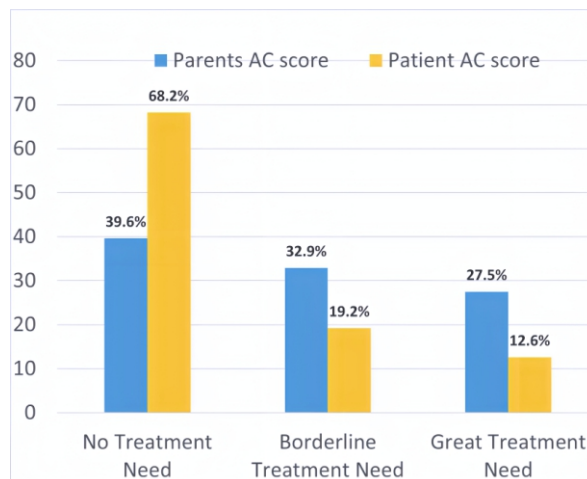


Figure 2: Comparison of parent and patients' dental aesthetics scores according to the Aesthetic Component of the IOTN (N=151)

Patient perceived orthodontic treatment needs and socio-demographic characteristics.

Table 2 shows the association between patients' perceived orthodontic treatment needs and socio-demographic characteristics. A larger proportion of those who reported need were females 13(72.2%) compared to the males. This difference, however, was not statistically significant.

When assessed by age, a higher proportion of those who reported a treatment need was in the 13-15 years age group (52.6%) as compared to the 10-12 age group 4(21.1%) and 16-18 years age group 5(26.3%). There were no statistically significant differences among the groups.

Table 2: Distribution of patient-perceived treatment needs by patients' socio-demographic characteristics by (N=151)

Variable	Patient perceived treatment needs n(%) *			P value**
	No treatment need	Treatment Need		
Sex	Male	47 (37.0)	5 (27.8)	0.601
	Female	80 (63.0)	13 (72.2)	
Age Group (years)	10-12	25 (19.1)	4 (21.1)	0.894
	13-15	74 (56.5)	10 (52.6)	
	16-18	32 (24.4)	5 (26.3)	

Table 3 shows the association of the AC scores of the parents and the patient's perceived needs.

Among those with needs, the majority of them 13(68.4%) were scored in the 'great treatment need' category. In addition, 21.1% were scored in the 'no treatment need' and 10.5% in the 'borderline treatment need' category. The difference was statistically significant ($p < 0.001$).

Table 3: Distribution of patient-perceived orthodontic treatment need by parents' perceived dental aesthetic (N=151)

Variable	Patient perceived treatment needs n(%) *			P value**
	No treatment need	Treatment Need		
Parent's AC Score	No treatment need	55 (42.3)	4 (21.1)	0.000
	Borderline treatment need	47 (36.2)	2 (10.5)	
	Great treatment need	28 (21.5)	13 (68.4)	

***Variation between N and n is due to the non-response of the participants in some of the items**

**** Chi-square test/Fisher's Exact test, significance level at $p < 0.05$**

DISCUSSION

The study was conducted among 10-18-year-old children and their parents attending the paedodontic clinic at MUHAS School of Dentistry.

Six million people inhabit the city, while the country's population is above 63 million. It provides dental services

to the public at lower costs than private facilities, thus catering to many patients of differing socioeconomic backgrounds.

Being the only institution to provide post-graduate training in the specialty of Orthodontics, the School of Dentistry receives many prospective orthodontic patients from all regions of Tanzania.

A majority of the study participants were females. This observation aligns with previous findings by Hamdan⁹, who reported that more females than males desire orthodontic treatment. With respect to age, more than half of the patients were in the 13-15 age group. Around this time, most young orthodontic patients undergo treatment as all the permanent teeth erupt. Early orthodontic treatment offers some benefits, including a reduction of treatment time and a positive effect on the child's quality of life by resolving psychosocial problems related to the malocclusion¹⁰⁻¹².

Similar to other previously reported studies, most of the patients were accompanied by their mothers. Mothers have been reported to play a big role in the drive for and initiation of treatment in their children¹³. At the same time, they have been reported to be more involved and influential in the motivation of their children for treatment than the fathers¹⁴.

Overall, the study showed that the perceived need for the child to get orthodontic treatment was higher among the parents than the children's self-perceived treatment needs. This finding is comparable to other previously reported studies in the literature^{15,16}. The reported perceived needs prevalence of 12.7% is slightly higher than the 11% prevalence previously reported in one study in Tanzania¹⁷. These differences could be attributed to the fact that that study was conducted among a school population while the current study was undertaken in a hospital setting.

In assessing dental aesthetics, many patients rated themselves in the 'No treatment need' category. This contrasts the parents who rated most of the patients in the 'Great treatment need' category. These findings suggest that while the children were pleased with their aesthetics, their parents found their dental aesthetics unattractive. This conforms with findings observed in the previous study by Seifi et al.¹⁸

This difference could be because parents are more objective in assessing dental aesthetics than their children. The patient-parent disparity in perception of treatment needs is critical in clinical planning and treatment execution since orthodontic treatment outcome immensely depends on patient compliance¹⁹. Establishing patient awareness before commencing treatment is important rather than working on parents' demands alone. Previous studies have reported children's tendency to rate themselves at the attractive end of the AC scale (grades 1-4). Furthermore, parents are likely to notice flaws in the child's dentition as often as a dentist would³. In addition, the observed differences could also be explained by the characteristics of the study participants in that almost twice as many females (64.1%) as males (35.9%) were involved in the study. Literature has shown that females tend to rate their dentition as more attractive¹⁹⁻²¹ and this could have increased the scores in the 'No treatment need' category. In contrast to the above findings, Otuyemi and Kolawole¹ found that the parents in their study rated the dental aesthetics of their children more favorably than the children themselves.

The age and sex of the patients were not significantly associated with perceived orthodontic treatment needs.

This observation is in agreement with the findings reported by Petronyte et al.²² Other studies have, however, reported contrasting findings^{9,23}

Study limitation

The study was conducted at a single center, and the findings should be cautiously interpreted. However, the findings may apply to orthodontic patients with characteristics similar to those of the study group. The questionnaire used for data collection was not a standard questionnaire and was developed for this study. However, it was developed after a thorough literature review of the subject matter and assessed and reviewed by two experienced orthodontists for content validity before being piloted.

CONCLUSION

The perceived need for orthodontic treatment was lower among the patients than it was with the parent's perception of this need. At the same time, parents perceived the dental aesthetics of their children as being worse off than how the children viewed their dental appearance.

Age and sex were not associated with the perceived need for treatment among the patients.

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