

Awareness of malocclusion and desire for orthodontic treatment in 11 to 14 year-old Nigerian schoolchildren and their parents

Kikelomo A. Kolawole,* Olayinka D. Otuyemi,* Sonny O. Jeboda† and Alice A. Umweni+

Department of Child Dental Health, Obafemi Awolowo University Ile-Ife,* Department of Preventive Dentistry, College of Medicine University of Lagos,† and the Department of Preventive Dentistry, University of Benin,+ Nigeria

Objectives: To investigate Nigerian children's and their parents' satisfaction with the children's facial and dental appearances and their desire for orthodontic treatment, and to compare their assessments of treatment need with those determined by an orthodontist.

Methods: The subjects were 242 11–14 year-old schoolchildren randomly selected from private and public schools in the Ife Central Local Government area, Nigeria. A questionnaire was used to obtain information from the children and their parents of their liking of the facial and dental appearances of the children and the need and desire for orthodontic treatment. The children, the parents and an orthodontist used the Aesthetic Component (AC) of the Index of Orthodontic Treatment Need (IOTN) to assess the need for treatment.

Results: More parents liked their child's facial and dental appearances than the children liked themselves. Almost twice as many schoolchildren thought they needed (27 per cent) and desired (29 per cent) orthodontic treatment than their parents (15 per cent). Low, but statistically significant correlations, were found between the children's, their parents' and an orthodontist's assessments of treatment need using the AC scale. Only 8 per cent of the children and 3 per cent of the parents considered that there was a 'moderate-definite' need of treatment. The orthodontist considered 38 per cent of the children had a 'moderate-definite' need of treatment.

Conclusions: The children's responses suggest greater concern about their facial and dental appearances, a greater perception of the need for orthodontic treatment and greater desire for treatment than their parents. These findings require further investigation as previous studies have reported that parents are usually more motivated for orthodontic treatment than their children.

(Aust Orthod J 2008; 24: 21–25)

Received for publication: May 2007

Accepted: March 2008

Introduction

Concern for personal appearance is a common feature of human society. Any shortfall between the individual's ideal and perceived body images may lead to discontent and some form of therapy. The desire for improvement in dental appearance and psychosocial wellbeing may be a common motivation for some individuals to seek orthodontic treatment.^{1–4} Other factors such as parental perception of malocclusion, self-esteem, general trust in the health care system, gender, age, peer group norms, social class and affordability of orthodontic care, may be involved.² The demand for correction of a mal-

occlusion is, however, not equal even among those with the same severity of occlusal deviation.^{5,6}

Because most orthodontic patients are children or adolescents⁷ their parents are likely to play an important role in decisions to have orthodontic treatment and ensure compliance.⁸ Lewit and Virolainen⁵ reported that parents were the most powerful single factor in motivation for treatment, although this contrasts with Shaw et al.,⁹ who reported that the general dental practitioner was the most powerful single factor in motivation for treatment. Parents may seek orthodontic treatment for their children for reasons other than for their child's malocclusion.^{8,10–12} The

child may reflect his or her parents' perceived concerns.⁵ For the majority of patients, the decision to embark upon orthodontic treatment is a combination of the aspirations of the child, the parent and the provider of the service.

Previous studies have reported the unmet orthodontic treatment need in Nigerian population groups, and the relationships between the factors considered to play a part in determining the desire for orthodontic treatment.^{13–16} Nigerians with malocclusions may have difficulty obtaining orthodontic treatment. The population of Nigeria is estimated to be close to 120 million, but there are less than 2500 qualified dentists and only 21 qualified orthodontists in either private practice or academic appointments. Furthermore, orthodontic care is provided on the basis of a 'fee for service' and may be too costly for many families living in rural areas.¹⁷ Although there appears to be a great need for orthodontic treatment in Nigeria, there may be less demand for treatment because of a lack of awareness and desire for treatment. Methods which can assist in estimating treatment need and appraise the orthodontic concerns of the children and their parents will be of value in planning future orthodontic services.

The objectives of this study were to investigate Nigerian children's and their parents' satisfaction with the children's facial and dental appearances and their desire for orthodontic treatment, and to compare their assessments of treatment need with those determined by an orthodontist.

Materials and methods

This study was a cross-sectional survey of 11 to 14 year-old schoolchildren attending selected government approved secondary schools in Ife Central Local Government Area, Ile-Ife, Osun State, Nigeria.

A minimum sample size of 132 was determined with the Computer Programme for Epidemiologists (PEPI), version 3.01.¹⁸ It was decided to use a total sample of 250 children with equal numbers of boys and girls. Approval to conduct the study was sought from the appropriate school authorities. To ensure an even socioeconomic distribution, government approved secondary schools in Ife Central Local Government Area were stratified into public and private schools, and five public and five private schools were randomly selected. Classes containing

11 to 14 year-old children were selected from the junior secondary sections of each school and the subjects (125 boys, 125 girls) were selected from these classes. Informed consent was obtained from the subjects and their parents. No child was found to have had or to be undergoing orthodontic treatment.

Self-administered questionnaires were completed by the children and their parents. The children completed their questionnaires at their schools and the parents at their homes. The questionnaire aimed to determine if each child and parent liked the child's facial and dental appearances; whether they perceived a need for orthodontic treatment; if they desired such treatment; and their perception of the child's dental appearance in comparison with the child's peers. The children and their parents were also asked to rate their child's level of dental attractiveness with the aesthetic component (AC) of the Index of Orthodontic Treatment Need (IOTN).¹⁹ Following completion of the questionnaires, the children were examined by an orthodontist (KAK) and impressions for dental study casts taken. The dental casts were assessed by the investigator for orthodontic treatment need using the AC component of the IOTN.

To determine the intra-examiner reproducibility, the study casts of 50 children were reassessed by the examiner four weeks after the initial examinations. The intra-examiner reproducibility for the AC was 0.805, indicating near perfect agreement. Descriptive statistics were used to determine the frequency distribution and percentage for each variable. Chi-squared tests were used to compare the responses to the questionnaires. Correlation coefficient tests were used to compare the AC scores by the examiner with the scores made by the children and their parents.

Results

Of the 250 schoolchildren and parents who agreed to participate in this study 242 parents (96.8 per cent) completed the questionnaire and 242 children were examined. Approximately 60 per cent of the parents who completed the questionnaires were fathers. The age range of the subjects was 11–14 years, mean age 12.37 ± 0.95 years.

The majority of the children (85 per cent) and their parents (95 per cent) liked their own or their child's facial appearance (Table I). There was a statistically significant difference between the responses given by

Table I. Children's and parent's perceptions of facial and dental appearance.

	Liked		Disliked		Total	
	N	%	N	%	N	%
Facial appearance*						
Children	205	84.7	37	15.3	242	100
Parents	230	95.0	12	5.0	242	100
Dental appearance†						
Children	150	62.0	92	38.0	242	100
Parents	201	83.1	41	16.9	242	100

* Chi-squared = 14.90; $p < 0.05$ † Chi-squared = 26.97; $p < 0.05$ **Table II.** Children's and parent's perceived need and desire for orthodontic treatment.

	Yes		No		Total	
	N	%	N	%	N	%
Need for orthodontic treatment*						
Children	66	27.3	176	72.7	242	100
Parents	36	14.9	206	85.1	242	100
Desire for orthodontic treatment†						
Children	70	28.9	172	61.1	242	100
Parents	36	14.9	206	85.1	242	100

* Chi-squared = 11.18; $p < 0.05$ † Chi-squared = 13.96; $p < 0.05$ **Table III.** Distribution of aesthetic scores by the children, the parents and the examiner.

AC grade	Treatment category	Children		Parents		Examiner	
		N	%	N	%	N	%
1-4	No need	219	92.0	207	96.7	151	62.4
5-7	Moderate need	11	4.6	5	2.3	23	30.2
8-10	Definite need	8	3.4	2	0.9	18	7.4

the children and their parents ($p < 0.05$). There was no statistically significant difference in the ratings of facial appearance by the boys and girls.

The perceptions of dental appearance are also given in Table I. The majority of the children (62 per cent) and significantly more parents (83 per cent) liked their own or their child's dental appearance.

The perceived need and desire for orthodontic treatment are given in Table II. Less than one third of the children (27 per cent) and their parents (15 per cent) perceived a need for orthodontic treatment. Significantly more children than their parents thought they needed orthodontic treatment ($p < 0.05$). The majority of the children (61 per cent) and their parents (85 per cent) did not desire orthodontic treatment: the child-parent difference was statistically significant ($p < 0.05$).

The children and their parents rated their own or their child's dental appearance in relation to his/her peers as 'average'. There was no statistically significant gender difference in the ratings.

The distributions of the AC by both children and parents were skewed to the attractive end of the scale

(Table III). More than 90 per cent of all respondents considered that there was no need for orthodontic treatment (Scores 1–4). Although the examiner had fewer subjects in the 'No need' category than the children and their parents (62 per cent versus 92 and 97 per cent respectively) his scores were still skewed towards the attractive end of the scale. The examiner considered 30 per cent of the subjects had a 'Moderate need' for treatment and 7 per cent a 'Definite need' for treatment.

Low, but statistically significant, correlations were found between the AC scores by the children and their parents ($r = .388$; $p < 0.000$), between the children and the examiner ($r = .252$; $p < 0.000$) and between the examiner and the parents ($r = .286$; $p < 0.000$).

Discussion

There have been several reports of the characteristics of malocclusion, of the attitudes to and perception of malocclusion and the need for orthodontic treatment in Nigerian children,^{13–15,20–23} but no report has compared the orthodontic concerns of the children and their parents with an assessment of treatment need by an orthodontist.

The majority of patients with malocclusions seek orthodontic treatment during adolescence and it is this group that may experience a disturbance in self-esteem.²⁴ For these reasons we decided to examine 11–14 year olds. We included their parents in the study because parental concerns and opinions can influence orthodontic treatment for their children.

The majority of parents were satisfied with their children's facial appearance. The reasons for this are

uncertain, but acceptance of the child's facial appearance by their parents whether or not the child had a malocclusion, may be partly due to cultural and religious beliefs and partly because of uncertainty about orthodontic treatment. Our finding of a higher proportion of children claiming they did not like their facial appearance, 15 per cent versus 5 per cent by their parents, may have occurred because the children were influenced by their peers. The gender of the children and their parents did not influence their perceptions of an unattractive/attractive face.

We found significantly more children disliked their dental appearance than their parents. The reasons for the marked differences, 38 per cent for the children versus 17 per cent for the parents, are uncertain and require further investigation. Some children with a malocclusion may not have been aware that they had a malocclusion or if they were aware it did not concern them. The perception of facial appearance by the subjects in the present study did not appear to be influenced by the arrangement of their teeth: more than twice the number of children and three times the number of parents did not like the dental appearance as compared with the facial appearance. Children, as a rule, are less able to evaluate their own appearance than the appearance of others, although there is an increasing awareness of the importance of dental features in ratings of overall facial attractiveness.^{23,25–27}

The perceived need for orthodontic treatment by the children (27 per cent) was significantly more than the need perceived by their parents (15 per cent). Our result contrasts with that of Pratelli et al.,⁸ who reported that over a third of the parents of British schoolchildren thought their children needed orthodontic treatment. In the present study the majority of the children who were concerned about dental appearance also perceived a need for treatment. This agrees with published studies that concern for dental appearance is a major factor influencing a patient's perceived need for treatment.^{1,6,28} The need for orthodontic treatment perceived by patients is of paramount importance when deciding whether orthodontic treatment is warranted, since their opinion is a good measure of their social adaptation and of the value of orthodontic treatment from a psychosocial point of view.²⁹

We found fewer children and their parents desired orthodontic treatment than the number reported by

Birkeland et al.²⁵ We also found twice as many children than their parents desired orthodontic treatment; possibly because the children were more familiar with orthodontic appliances than their parents. We suspect many children and parents may have seen an orthodontic appliance for the first time during this study. Familiarity with, and willingness to wear, an orthodontic appliance has been found to influence the desire and demand for orthodontic treatment.^{30,31}

We found both subjects and their parents highly rated their dental attractiveness on the AC scale. The correlations between the children, their parents and the orthodontist examiner were low. Previous studies have reported that lay and professional perceptions of dental aesthetics and orthodontic treatment need differ.^{25,32,33} Patients' concerns do not always coincide with evaluations of treatment need by an orthodontist.³⁴

One of the limitations of the AC results by the children and, to a lesser extent, their parents, is that many had difficulty understanding the concept of the AC scale. The photographs in the AC scale are not intended to be an exact representation of the arrangement of the subjects' anterior teeth. Four of the children in our study were unable to match their dental appearance with any of the pictures on the scale.

The children's responses suggest greater concern about their facial and dental appearances, a greater perception of the need for orthodontic treatment and greater desire for treatment than their parents. This disagrees with previous studies that have reported parents are usually more motivated for orthodontic treatment than their children.^{5,10} The extent to which the parents' perceptions of a need and desire for orthodontic treatment may have been influenced by the cost of orthodontic treatment is uncertain. In Nigeria all dental treatment, even in government-funded hospitals, must be paid for by the patients and/or their parents or guardians. In Nigeria there may be a need for the public to be educated on the possibilities of orthodontic treatment.

Conclusions

More Nigerian parents liked their children's facial and dental appearances than the children liked themselves.

About twice as many schoolchildren considered they needed orthodontic treatment than their parents.

Similar numbers of schoolchildren and their parents desired orthodontic treatment.

Low, but statistically significant correlations, were found between the children, their parents' and an orthodontist's assessment of treatment need according to the AC scale of the IOTN.

The orthodontist's assessment of treatment need, based on the AC scale of the IOTN, were considerably higher than those of the children and their parents. Part of this difference may be due to the difficulty the children and parents had understanding the concept of the AC scale.

Corresponding author

Dr K. A. Kolawole
Department of Child Dental Health
Obafemi Awolowo University Ile-Ife
Nigeria
Tel: (+234) 80 3723 4721
Email: kkole@oauife.edu.ng and
topkol2001@yahoo.com

References

- Gosney MBE. An investigation into some of the factors influencing the desire for orthodontic treatment. *Br J Orthod* 1986;13:87-94.
- Shaw WC, O'Brien KD, Richmond S. Quality control in orthodontics; Factors influencing the receipt of orthodontic treatment. *Br Dent J* 1991;170:66-8.
- Lew KK. Attitudes and perceptions of adults towards orthodontic treatment in an Asian community. *Community Dent Oral Epidemiol* 1993;21:31-5.
- Albino JE. Factors influencing adolescent cooperation in orthodontic treatment. *Semin Orthod* 2000;6:214-23.
- Lewit DW, Virolainen K. Conformity and independence in adolescent's motivation for orthodontic treatment. *Child Dev* 1968;39:1188-200.
- Shaw WC. Factors influencing the desire for orthodontic treatment. *Eur J Orthod* 1981;3:151-62.
- Haynes S. Trends in the numbers of active and discontinued orthodontic treatments in the General Dental Service. 1964-1986/87. *Br J Orthod* 1991;18:9-14.
- Pratelli P, Gelbier S, Gibbons DE. Parental perception and attitudes on orthodontic care. *Br J Orthod* 1998;25:41-6.
- Shaw WC, Gbe MJ, Jones BM. The expectations of orthodontic patients in South Wales and St. Louis, Missouri. *Br J Orthod* 1979;6:203-5.
- Baldwin DC, Barnes ML. Psychosocial factors motivating orthodontic treatment. *J Dent Res* 1965;43:461 (Abstract)
- Baldwin DC, Barnes ML. Pattern of motivation in families seeking orthodontic treatment. *J Dent Res* 1966;44:412 (Abstract).
- Baldwin DC. Appearance and aesthetics in Oral Health. *Community Dent Oral Epidemiol* 1980;8:244-56.
- Otuyemi OD, Ugboko VI, Adekoya-Sofowora CA, Ndukwe KC. Unmet orthodontic treatment need in rural Nigerian adolescents. *Community Dent Oral Epidemiol* 1997;25:363-6.
- Otuyemi OD, Ogunyinka A, Dosunmu O, Cons NC, Jenny J, Kohout FJ et al. Perceptions of dental aesthetics in the United States and Nigeria. *Community Dent Oral Epidemiol* 1998;26:418-20.
- Onyiaso CO. An assessment of relationship between self-esteem, orthodontic concern, and Dental Aesthetic Index (DAI) scores among secondary school students in Ibadan, Nigeria. *Int Dent J* 2003;53:79-84.
- Onyiaso CO, Aderinokun GA. The relationship between Dental Aesthetic Index (DAI) and perceptions of aesthetics, function and speech amongst secondary school children in Ibadan, Nigeria. *Int J Paediatr Dent* 2003;13:336-41.
- Otuyemi OD. Orthodontics in Nigeria: journey so far and the challenges ahead. *J Orthod* 2001;28:90-2.
- Abramson JG, Gahlinger PM. Computer Programme for Epidemiologists (PEPI) version 3.01, 1993-2000.
- Brook PH, Shaw WC. The development of an index of orthodontic treatment priority. *Eur J Orthod* 1989;11:309-20.
- Isiekwe MC. Malocclusion in Lagos, Nigeria. *Community Dent Oral Epidemiol* 1983;11:59-62.
- Isiekwe M. Distribution of overjet values in a Negro population in Nigeria. *Community Dent Health* 1986;3:61-4.
- Isiekwe M. Overbite values in Nigerian children. *Odontostomatol Trop* 1989;12:17-19.
- Otuyemi O, Umweni A, Dacosta O, Fatusi O. Attitudes and perception of Nigerian children towards orthodontic treatment. *Pediatr Dent J* 2000;10:13-17.
- Simmons RG, Rosenberg F, Rosenberg M. Disturbance in the self-image at adolescence. *Am Social Rev* 1973;38:553-68.
- Birkeland K, Boe OE, Wisth PJ. Orthodontic concern among 11-year-old children and their parents compared with orthodontic treatment need assessed by Index of Orthodontic Treatment Need. *Am J Orthod Dentofacial Orthop* 1996;110:197-205.
- Berscheid E, Walster E, Bohrnsteat G. The happy American body: a survey report. *Psychology Today* 1973;7:119-31.
- Tedesco LA, Albino JE, Cunnat JJ, Green LJ, Lewis EA, Slakter MJ. A dental-facial attractiveness scale. Part 1. Reliability and validity. *Am J Orthod* 1983;83:38-43.
- Lindsay SJ, Hodgkins JF. Children's perception of their own malocclusions. *Br J Orthod* 1983;10:13-20.
- Otuyemi OD, Noar JH. Variability in recording and grading the need for orthodontic treatment using the handicapping malocclusion assessment record, occlusal index and dental aesthetic index. *Community Dent Oral Epidemiol* 1996;24:222-4.
- Tulloch JF, Shaw WC, Underhill C, Smith A, Jones G, Jones M. A comparison of attitudes towards orthodontic treatment in British and American communities. *Am J Orthod* 1984;85:253-9.
- Gravely J. A study of need and demand for orthodontic treatment in two contrasting National Health Service regions. *Br J Orthod* 1990;17:287-92.
- Shaw WC, Lewis HG, Robertson NR. Perception of malocclusion. *Br Dent J* 1975; 138: 211-16.
- Prahl-Andersen B, Boersma H, van der Linden FP, Moore AW. Perceptions of dentofacial morphology by laypersons, general dentists and orthodontists. *J Am Dent Assoc* 1979; 98:209-12.
- Shue-Te Yeh M, Koochek AR, Vlaskalic V, Boyd R, Richmond S. The relationship of 2 professional occlusal indexes with patients' perceptions of aesthetics, function, speech and orthodontic treatment need. *Am J Orthod Dentofacial Orthop* 2000;118:421-8.