The need and demand for orthodontic treatment in 13- to 15-year-olds in Nairobi, Kenya

Peter M. Ng'ang'a, Arild Stenvik, Florence Ohito and Björn Ögaard

Department of Pediatric Dentistry and Orthodontics and Department of Periodontology and Community Dentistry, University of Nairobi Dental School, Nairobi, Kenya, and Department of Orthodontics, University of Oslo Dental Faculty, Oslo, Norway

Ng'ang'a PM, Stenvik A, Ohito F, Ögaard B. The need and demand for orthodontic treatment in 13- to 15-year-olds in Nairobi, Kenya. Acta Odontol Scand 1997;55:325–328. Oslo. ISSN 0001-6357.

The need for orthodontic treatment in Kenya has previously not been investigated. This study was undertaken to assess the need for orthodontic treatment in 13- to 15-year-old children in Nairobi. The objective need was assessed in 919 children by using the Norwegian treatment need index, and the subjective need was assessed in 739 children by using a structured questionnaire. Objective treatment need was recorded in 29% and subjective need in 33% of the children. Less than 1% were allocated the 'very great need' category. Relatively more girls than boys were dissatisfied with the appearance of their teeth, and a significantly higher number of girls ($P < 0.001$) said they would like to have their teeth straightened. The children's perceived need for treatment correlated significantly with the treatment need index. Fixed appliances were found necessary for correcting malocclusion in 23% of the children and removable appliances in 6%. Future studies in Kenya should be directed at determining the societal perception of malocclusion, upon which treatment standards may be based. □ *Epidemiology; malocclusion*

Arild Stenvik, University of Oslo Dental Faculty, Department of Orthodontics, P.O. Box 1109 Blindern, N-0317 Oslo, Norway

The occurrence of malocclusion in children has been reported in a few studies from Kenya (1–5). The values given differ widely, ranging from 39% to 72%. Clinical observation shows that there exists both a subjective and an objective need for orthodontic treatment in the country, but the level of demand remains unknown. Without a satisfactory estimate of the need and demand for treatment, it is difficult to organize a meaningful orthodontic service both from a manpower and financial point of view.

Orthodontic treatment is often carried out to improve dental appearance. Hence, the individuals' perception of their own malocclusion is an important factor in determining treatment need. To the patient, the psychosocial benefits of treatment usually prevail over improvements in function and dental health (6). In assessing treatment need, therefore, it would seem judicious to do so both objectively and subjectively.

The purpose of this study was to assess the need for orthodontic treatment in children aged 13–15 years in Nairobi from these two perspectives.

Subjects and methods

The sample in this study comprised of 919 non-orthodontically treated children aged 13–15 years (468 boys, 451 girls; mean age, 14.1 years). The children were from 6 randomly selected public primary schools of the 174 in the city. Further details on the sample selection and examination are described elsewhere (5).

Immediately before examination 739 children from 5 schools were asked to complete a structured questionnaire. This formed the basis for a subjective assessment for treatment need. Owing to technical problems, questionnaires could not be distributed to the children in one of the schools. The questionnaire is shown in Table 1.

The criteria applied to assess objective treatment need in the 919 children were those used by the Norwegian National Health Insurance Scheme (7).

For those found to need treatment, a clinical judgement was made on whether the subject would require fixed or removable appliance therapy to correct the malocclusion satisfactorily. This judgement was made by a qualified orthodontist and was based on the complexity of the malocclusion, with particular reference to the type of tooth movement considered necessary.

A chi-square statistic was used to test for significant differences between boys and girls in the objective treatment need and in the response to the questionnaire. The association between the objective treatment need and the individuals' preferred responses to the questionnaire was evaluated statistically using the Spearman rank order correlation test.

Results

The results from the questionnaire are presented in Table 1.

Table 1. Orthodontic self-awareness and concern in 739 orthodontically untreated children aged 13 to 15 years in Nairobi. Statistical tests indicate the association between self-awareness and concern and objective treatment need (Spearman rank order correlation) and differences between males (M) and females (F) (chi-square)

Question	Response alternative	*n*	%
a. Do you find that your teeth are irregular (not straight) or come together in a wrong way?	Yes, very much	70	9
	Yes, somewhat	183	25
	No, not at all	411	56
Association: $P < 0.001$	Do not know/do not care	75	10
M:F: No significant difference			
b. Are you satisfied or dissatisfied with the appearance of your own teeth now?	Very satisfied	324	44
	Rather satisfied	198	27
	Rather dissatisfied	123	17
Association: Not significant	Very dissatisfied	64	9
M:F: $P < 0.05$; More females dissatisfied	Do not know/do not care	30	4
c. Do you find your teeth look better or worse than those of most people of your age?	Much better	217	29
	Somewhat better	179	24
	Like most of the others	161	22
Association: $P < 0.001$	Somewhat worse	81	11
M:F: $P < 0.05$; More females thought their teeth looked better than those of others	Much worse	35	5
	Do not know/do not care	66	9
d. Do your schoolmates tease you (make jokes) about the appearance of your teeth or jaws?	Yes, often	11	1
	Yes, sometimes	115	16
	Yes, rarely	31	4
	No, never	557	75
	Do not know/do not care	25	3
e. Would you like to have your teeth straightened?	Yes	245	33
	No	317	43
Association: $P < 0.001$	Not sure	177	24
M:F: $P < 0.001$; More girls would like to have their teeth straightened			

The percentages of those needing orthodontic treatment in accordance with the degree of need are presented in Table 2. Professionally determined need was observed in about 29% of the children, whereas desire for treatment was expressed by about 33% of the children.

About 34% of the children considered their teeth irregular, whereas 56% did not. There was no sex difference in these responses. Dissatisfaction with the appearance of the teeth was expressed by 26% of the children. Relatively more girls than boys were dissatisfied with the appearance of their teeth, and a significantly higher number of girls ($P < 0.001$) said they would like to have their teeth straightened.

Twenty-one per cent of the subjects said they were teased by their schoolmates on account of the appearance of their teeth. There was no gender difference in this response. Most of the children said their teeth looked either better or like those of the others. Except for the responses to the question 'Are you satisfied or dissatisfied with the appearance of your teeth now?', there was significant association between the professionally determined need for treatment and the orthodontic self-awareness and concern expressed by the children for the other questions.

The children's responses to the question 'Would you like to have your teeth straightened?' correlated significantly ($r = 0.22$) with the category of treatment need.

Discussion

The present investigation showed only slight discrepancy between the objective need and the demand for orthodontic treatment. The demand (33%) was slightly higher than the objective need (29%). This finding has been reported by other workers (7).

The need for orthodontic treatment in Caucasians aged 6–13 years is reported to be between 45% and 75% (8, 10–13). 'Great (urgent/immediate) need' for treatment in these studies varies between 10% and 25%. The present study showed a 'great/ obvious' need for orthodontic treatment in 29% of the sample.

About 34% of the children said their teeth were irregular, even though a prevalence of deviating

Table 2. Distribution of 13- to 15-year-old Nairobi children needing orthodontic treatment (objective assessment) on the basis of category of need. The need was assessed using the Norwegian National Health Insurance Scheme (7)

	n = 919	%
Treatment need		
Very great	3	0.3
Great	98	10
Obvious	174	19
Little/none	644	70

occlusal traits had been diagnosed in more than 70% of them (5). These findings are in accord with those of researchers elsewhere in the world. In a study of Swedish adults (14) it was reported that only 34% of the sample examined were aware of irregularities in their teeth, although, according to strict orthodontic criteria, such problems were present in 75% of the sample. Myrberg & Thilander (8) found that only 50% of a group of children thought to need treatment actually demanded it. Recently, Espeland et al. (7) found that more than 50% of Norwegian children allocated to the group 'great need' for treatment experienced no need for treatment.

In the present study, 21% of the children were teased on account of the appearance of their teeth. For most patients the primary psychologic impact of a malocclusion does not result from the presence of obvious anomaly but from the individual's own reaction to the anomaly (15). The children's responses to the question 'Would you like to have your teeth straightened?' correlated weakly but significantly with the index categories (r = 0.22). The desire for treatment was more frequently reported than dissatisfaction with the occlusal appearance. This finding has previously been reported for a sample of 11-year-old Norwegian children (7).

It has been suggested (7, 16, 17) that a desire for treatment may reflect a professional trust or a basic general faith in the service. Familiarity with appliances may also influence the desire and demand for treatment by reducing the resistance to wearing conspicuous appliances (17, 18). It has also been suggested that common exposure to the sight of appliances may actually stimulate demand among those who wish to ensure that they have not missed out on an opportunity for improvement (19). It is questionable whether these factors contributed significantly to the findings in the present study.

About 4% of the children had experienced some form of orthodontic treatment (5). Hence, only a very small proportion of the children could have been familiar with orthodontic appliances. It is more probable that in this investigation the motivation for wanting treatment in some of the children might have been the desire to have pleasing dental esthetics such as commonly depicted in commercial advertising in the mass media. It is likely that comprehensive information about treatment factors such as expenses, duration, and inconvenience might have altered these results.

Clinical judgement suggested that 23% of the subjects would require fixed appliances to achieve satisfactory results. This form of treatment is expensive by any standards and would no doubt take second place in the public dental health-care service in Kenya. Furthermore, to a great extent, treatment with fixed appliances requires specialty training in orthodontics. Currently, fixed orthodontic treatment is non-existent in the public dental service in Kenya, and only a very few practitioners in the country undertake such work in private practice. For the moment, therefore, some malocclusions will remain untreated, whereas a significant proportion will continue to be managed by general dental practitioners with removable appliances.

It is suggested that because of possible variation in occlusal conditions and in the degree of need for treatment in different areas of the country, other similar studies should be done to assess the prevalence of malocclusion and need for treatment in different regions. In addition, future studies should aim at determining the societal perception of malocclusion on which treatment standards may be based. Such research should emphasize trying to establish the traits that cause the greatest concern to individuals.

Acknowledgements.—We express our appreciation to the Office of the President and the City Education Office for permission to carry out this study and to the headmasters and children in the schools involved for their cooperation. We also thank Mrs. Donna Pettersen of the University of Oslo Dental Faculty for her assistance in data entry of the field results and transcription of the completed manuscript.

References

1. Kapila S. Distribution of malocclusion in African and Asian children in some Nairobi schools. Odontostomatol Trop 1983;6: 209–14.
2. Garner LD, Butt MH. Malocclusion in Black Americans and Nyeri Kenyans. An epidemiologic study. Angle Orthod 1985;55: 139–46.
3. Ng'ang'a PM. A study of occlusal anomalies and tooth loss in children aged 13–15 years in Nairobi. E Afr Med J 1991;68:980–8.
4. Ng'ang'a PM, Karongo PK, Chindia ML, Valderhaug J. Dental caries, malocclusion and fractured incisors in children from a pastoral community in Kenya. E Afr Med J 1993;70:175–8.
5. Ng'ang'a PM, Ohito F, Ögaard B, Valderhaug J. The prevalence of malocclusion in 13- to 15-year-old children in Nairobi, Kenya. Acta Odontol Scand 1996;54:126–30.
6. Brook PH, Shaw WC. The development of an index of orthodontic priority. Eur J Orthod 1989;11:309–20.
7. Espeland LV, Ivarsson K, Stenvik A. A new Norwegian index of orthodontic treatment need related to orthodontic concern among 11-year-olds and their parents. Community Dent Oral Epidemiol 1992;20:274–9.
8. Myrberg N, Thilander B. Orthodontic need of treatment in Swedish school children from objective and subjective aspects. Scand J Dent Res 1973;81:81–4.

9. Ingervall B, Hedegard B. Awareness of malocclusion and desire for orthodontic treatment in 18 year-old Swedish men. Acta Odontol Scand 1974;32:93–101.
10. Haynes S. Orthodontic treatment needs in English children aged 11–12 years. Br J Orthod 1974;1:9–12.
11. Foster TD, Day AJW. A survey of malocclusion and need for orthodontic treatment in a Shropshire school population. Br J Orthod 1974;1:73–8.
12. Hannuksella A. The prevalence of malocclusion and the need for orthodontic treatment in 9 year-old Finnish school children. Proc Finnish Dent Soc 1977;73:21–69.
13. Heikinheimo K. Need of orthodontic treatment in 7-year-old Finnish children. Community Dent Oral Epidemiol 1978;6:129–34.
14. Ingervall B, Mohlin B, Thilander B. Prevalence and awareness of malocclusion in Swedish men. Community Dent Oral Epidemiol 1978;6:308–14.
15. Gosney MBE. An investigation into some of the factors influencing the desire for orthodontic treatment. Br J Orthod 1986;13:87–94.
16. Shaw WC, Gabe MJ, Jones BM. The expectations of orthodontic patients in South Wales and St. Louis, Missouri. Br J Orthod 1979;6:203–5.
17. Tulloch JFC, Shaw WC, Smith A, Jones G, Jones M. A comparison of attitudes toward orthodontic treatment in British and American communities. Am J Orthod 1984;85:253–9.
18. Gravely JF. A study of need and demand for orthodontic treatment in two contrasting national health service regions. Br J Orthod 1990;17:287–92.
19. 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.

Received for publication 25 September 1995
Accepted 10 June 1997