

Needs, demands and appropriateness of referral to orthodontic treatment in the North West Armed Forces Hospital in Tabuk, Saudi Arabia

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تهدف هذه الدراسة إلى تقييم الاحتياجات الحقيقية لتقويم الأسنان و أمراض الفم المختلفة والحالة الاجتماعية والسلوك الصحي لعينة من مرضى تقويم الأسنان بمستشفى القوات المسلحة بتبوك. وقد تم اختيار عينة من ٣٢٠ مريضاً من المرضى المحولين لطبيب التقويم. وقد قام المرضى بالإجابة عن استبيان عن حالتهم الاجتماعية وسلوكياتهم الصحية واحتياجاتهم للتقويم ولأي علاج أسنان من وجهة نظرهم. كما تم فحص المرضى بواسطة استشاري في تقويم الأسنان لتقييم احتياجاتهم للتقويم وكذلك احتياجاتهم لأي علاج سني آخر. كانت نسبة الإناث المحولات لعلاج تقويم الأسنان أعلى نسبياً من الذكور (٦٠٪). لم يكن للعوامل الاقتصادية والاجتماعية تأثير على طلب المرضى لعلاج التقويم. وقد تبين أن ٤٣٪ فقط من المرضى المحولون لتقويم الأسنان لديهم احتياج حقيقي للتقويم. بينما وجدنا أن ٢٥٪ من مرضى التقويم لديهم تسوس أسنان في سن واحدة على الأقل، ٤٨٪ لديهم نزيف باللثة، و ٢٢,٣٪ لديهم ترسبات على الأسنان، و ٦,٥٪ لديهم جيوب باللثة بعمق ٤مم أو أكثر. وتبين نتائج هذه الدراسة أن احتياجات المرضى لتقويم الأسنان قد تكون مبالغاً، بينما توجد أمراض أسنان أخرى لدى المرضى لا تحظى بنفس الاهتمام. ومن واقع نتائج تلك الدراسة يبدو أن هناك حاجة لوضع قواعد لتحويل المرضى لأخصائيي تقويم الأسنان. كما توجد حاجة لزيادة الاهتمام بعلاج الأسنان الأولي كالتشو والعلاج الوقائي.

This study aimed at assessing normative needs for orthodontic treatment, other dental problems, socioeconomic condition and attitude toward dentistry among a sample of patients who were referred for orthodontic treatment in the Northwest Armed Forces Hospital (NWAFFH) in Tabuk, Saudi Arabia. A convenient sample of 320 patients who were referred for orthodontic treatment was selected to participate in the study. Patients were asked to complete a questionnaire on perception of their oral health status, demands for orthodontic treatment, other oral treatment needs, attitude toward dentistry and socioeconomic factors. Patients were examined by a consultant orthodontist to assess their normative orthodontic needs using the Index for Orthodontic Treatment Needs (IOTN). Other dental needs were also assessed. Percentage of females referred for orthodontic treatment was slightly higher than males (60%). Socioeconomic factors did not seem to influence demands for the service. Only 34% of the sample had IOTN score of 3 or more (moderate to very great needs), 52% had caries in at least one tooth, 48% had bleeding on probing, 22.3% had calculus, and 5.6% had pocket 4 mm or more. The results of the study indicated that while demands for orthodontic treatment seemed to be exaggerated, needs for other dental treatments were underestimated. The results implied that expensive and specialized dental services were highly promoted in a community that lacks appropriate access to primary dental care. The results necessitate the development and implementation of proper guidelines for referral for orthodontic treatment. There is also a need to increase the emphasis on highly needed primary dental care.

INTRODUCTION

Increasing demands for efficiency in the delivery of dental services necessitate continuous assessment of quality of care and monitoring of the appropriateness of referrals for specialized dental care. Orthodontic treatment is one of the complicated, long-term treatment and costliest dental specialties, which requires the work of highly trained specialists. However, studies have shown that demands for this service are

not always consistent with the patient's actual needs.^{1,2} While some patients with near normal occlusion might express orthodontic concern others with great need may not express concern.³ Even when patients were referred by a dentists, significant number of the referrals were inappropriate.⁴ Research on orthodontic treatment needs also suggested that perception of orthodontic treatment needs might be influenced by factors such as socioeconomic status, availability and affordability of the service.^{5,6}

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Similar phenomena were observed among patients demanding orthodontic treatment in the Northwest Armed Forces Hospital (NWAFFH) in Tabuk, Saudi Arabia. Although all patients seen by the orthodontist consultant were referred by general practitioner (GP) dentists, demands for orthodontic treatment were not always justified by normative needs. It was also observed that many patients who showed concerns about their occlusion and requested orthodontic treatment had more immediate dental treatment needs for dental caries and periodontal diseases but they were either unaware of these needs or perceived them unimportant. The impact of this phenomenon would be an increase in workload on an already busy specialist. It might also influence policy makers to shift the emphasis from greatly needed primary and preventive services toward possibly exaggerated, expensive and specialized treatment. This will lead to an increase in the cost of dental services without improving the oral health status of the population. Therefore, it was necessary to examine the normative orthodontic and other dental treatment needs among those who demanded orthodontic treatment at the NWAFFH. It was also important to examine socioeconomic and culture factors that might influence patients' decision to seek orthodontic treatment.

METHOD

A questionnaire was developed which contained questions pertaining to patients' socioeconomic status, education, attitude toward dentistry, perception of oral health status and needs for orthodontic treatment (Appendix 1). A convenient sample of 320 patients who demanded orthodontic treatment and who were referred to orthodontic consultant in the NWAFFH participated in the study. A consultant orthodontist and a GP dentist,

who were trained on using the Dental Health Component (DHC) of the Index for Orthodontic Treatment Needs (IOTN), conducted the clinical examination.⁷ All participants included in the sample were examined by the orthodontist to assess orthodontic treatment needs using the DHC of the IOTN. Patients with scores 3-5 (moderate to very great need) were included. Subjects with untreated caries were considered inappropriate referrals. Participants were also examined to check the presence of untreated caries, missing teeth and periodontal condition using the CPITN Index. Participants and/or their guardians were requested to complete the questionnaire. Ten percent of the patients were re-examined to check for reliability.

Data obtained from the clinical examination and the questionnaire were entered into a computer database and the SPSS program was used to analyze the data.

RESULTS

Out of the 320 patients who participated in the study, 59.7% were females. The age ranged from 7 to 46 years, mean age was 17.8. Around 90% of the participants were military staff or their dependents. Approximately 62% reported that their total family income was less than 7,000 Saudi Riyals per month.

In a group of questions pertaining to needs for dental treatment 98% perceived the need for orthodontic treatment, while only 30% thought they needed filling, 13% extraction, 47.6% oral hygiene treatment, 6.7% periodontal treatment, and 15% prosthodontic appliance.

Approximately 31% perceived their teeth appearance and alignment to be ugly, 46% perceived them acceptable and 23% thought their teeth alignment looked good. At the same time, 66% thought

they had no cavities in their teeth. Around 82% said they brushed their teeth regularly and 37% said their gums bled on brushing.

Approximately 34% said they visited dentist regularly for check up, the rest visited dentist for emergencies only. Thirty six percent believed that dental problems may have an impact on occlusion.

Reliability in clinical examination was high ($\kappa = 0.9$). When patients were clinically examined by a consultant orthodontist, using the IOTN, it was found that 66.2% of the patients had no need or little needs (Table 1).

When examination was conducted to assess other dental needs, it was found that 52.5% had dental caries in at least one tooth. The maximum number of decayed teeth was 16 and the mean was 1.43. Also, 44.4% of the patients had at least one missed tooth, maximum number of missing teeth was 8, and mean was 0.92. The percentages of patients with needs for different dental problems are shown in Table 2.

When score 3 or more of the IOTN was used as an indicator for needs for orthodontic treatment, it was found that 33.9% of the patients referred for orthodontic treatment actually needed the

Table 1. Patients with actual needs for orthodontic treatment according to the "Index for Orthodontic Treatment Needs"

Need	%
No need or very little need	20.4
Little need	45.8
Moderate need	23.8
Great need	8.5
Very great need	1.6

Table 2. Patients and clinically detected dental condition other than orthodontic needs

Dental Condition	%
Dental caries in one tooth or more	52.5
Missing teeth (one or more)	44.4
Bleeding on probing	48
Calculus	22.3
Pocket 4mm or more	5.6%

treatment. A simple calculation to exclude patients who had untreated dental caries in their teeth from those who had IOTN score of 3 or more revealed that only 15% of the patients were appropriately referred for orthodontic treatment.

Table 3 exhibits a comparison between patients' perception and demand for dental care and their normative needs.

Demands for orthodontic treatment were not statistically associated with gender nor with socioeconomic status indicated by income (Table 4). Neither the level of education of parents nor that of patients was associated with demand for orthodontic treatment.

The correlation between demand for orthodontic treatment and actual need (IOTN score 3-5) was insignificant and very low (Correlation value: 0.110).

DISCUSSION

The findings of this study implied that demand for orthodontic treatment was exaggerated in the NWAFFH community. The results also implied the lack of proper standards for referral for orthodontic treatment which GP dentists could use to

Table 3. Comparison between patients' perceptions and demands for care and their actual needs

Perception and demand	Normative needs
Demand orthodontic treatment: 98%	IOTN score 3 or more: 33.9%
Demand filling: 30%	Untreated caries: 52.5%
Bleeding on brushing: 37%	Bleeding on probing: 48%
Demand prosthodontic appliance: 15%	Had missing teeth: 44.4%

Table 4. Distribution of patients who demanded orthodontic treatment by gender and income

		Percent of patients demanding orthodontic	Significance
Gender	Males	99.2%	NS
	Females	96.8%	
Income	Less than SR7000	97.7%	NS
	More than SR7000	98.1%	

identify patients who needed orthodontic treatment.

While other studies considered patients with IOTN score 4 and 5 to have normative needs for orthodontic treatment,^{4,6} in this study we used score 3 and above as indicators for normative needs. However, there was an apparent inconsistency between demands for orthodontic treatment and normative needs in this study when compared to those reported in other studies.^{4,8-11} At the same time, a very high proportion of the referred patients had needs for other dental treatment compared to what similar studies reported.⁴

While socioeconomic factors seemed to negatively influence patients' demands for orthodontic treatment,⁶ they did not seem to have effect on demands for orthodontic treatment in this study. This could be explained by the fact that orthodontic treatment is free of charge at NWAFFH. Similar to what was reported in other Saudi studies, gender was not a significant factor influencing demand.^{12,13}

The results also indicated that the percentage of patients who were appropriately referred to the orthodontist was very low compared to other studies.⁴

Contrary to exaggerated demands for orthodontic, there was an apparent underestimation of actual needs for other dental treatment despite their effect on occlusion as indicated by other studies.¹⁴ Similar phenomenon was observed in other Saudi studies, which implied underestimation of greatly needed primary dental services and emphasis on specialized treatment.^{15,16}

It is true that there could be a psychological impact on orthodontic patients, even those with very minor malocclusion problem. However, the dilemma is whether dealing with this minor orthodontic problem could be afforded in a publicly funded system that has to deal with bigger and more serious

dental problems which also have their psychological consequences on patients?

The exaggerated demand for a very specialized and expensive orthodontic service in a population with high prevalence of caries, poor oral hygiene and high needs for basic dental services^{17,18,19} was probably encouraged by the promotion of this free orthodontic service and the lack of standards for referral.

CONCLUSION

While there were great demands for orthodontic treatment in the community served by NWAFFH, these demands were not justified by internationally recognized standards for the diagnosis of malocclusion. At the same time, there were greater needs in the community for primary dental services.^{17,18,19}

The results of the study indicated the necessity of developing and implementing proper standards for referral for orthodontic treatment. There is an obvious need to increase the emphasis on basic dental services and preventive treatment in this population and to improve access to primary dental services. There is also a need for campaigns, which should aim at improving the awareness of the population for oral hygiene and treatment of other dental problems.

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Appendix 1

Questionnaire: Needs and demands for orthodontic treatment

Date: _____ Patient's code: _____

Who will fill the questionnaire:

(a) participant (b) parent/ guardian

1. Age.
2. Gender: (a) Male (b) Female
3. Where do you live?
(a) Cantonment (b) Tabuk
(c) Urban area (outside Tabuk)
(d) Rural area (outside Tabuk)
4. Marital status: (a) Married (b) Single
5. If single, do you live with your parents?
(a) Yes (b) No
6. Occupation?
7. If you do not work, what is the father/ guardian/ husband occupation?
8. How do you categorize the family income from all sources (per month)? (a) Less than SR3,000 (b) SR3,000-6,999 (c) SR7,000-14,999 (d) SR 15,000 or more
9. How many persons live in the household?
10. What is your level of education: (a) Primary school or less (b) Intermediate school (c) Secondary or technical school (d) Community college (less than four years program) (e) University degree
11. What is the highest level of education of the parents? (1) Father: (a) Primary school or less (b) Intermediate school (c) Secondary or Technical school (d) Community college (less than four years program) (e) University degree (2) Mother (a) Primary school or less (b) Intermediate school (c) Secondary or Technical school (d) Community college (less than four years program) (e) University degree
12. Do you brush your teeth daily?
(a) Yes (b) No

13. Do you know the brushing technique?
(a) Yes (b) No
14. Do your gums bleed when you brush?
(a) Yes (b) No
15. How would you describe your visits to the dentist? (a) I visit dentist regularly for check ups (b) I visit dentist for emergency reasons, when I am in pain (c) I have never visited a dentist
16. i. How do you perceive the appearance of your teeth? (Good, Fair, Poor)
ii. Do you think orthodontic treatment is needed to restore the appearance of your teeth? (Yes, No)
iii. For how long did you have the orthodontic problem?
iv. Did you seek orthodontic treatment/consultation before? (Yes, No)
a. If your answer is "yes", where did you seek treatment? (1) Public hospital (2) Private clinic/ hospital
b. If your answer is "no", why did not you seek treatment/ consultation earlier?
17. Do you know that any of your siblings/ friends/ relatives uses/d orthodontic appliance? (Yes, No)
18. How do you perceive other aspects of your oral health: (a) Dental caries: (good, fair, poor) (b) Oral hygiene: (good, fair, poor) (c) Gingival/ periodontal condition: (good, fair, poor)
19. Do you think you need any dental treatment for conditions other than malocclusion? (a) Filling (Yes, No, Don't Know) (b) Periodontal surgery (Yes, No, Don't Know) (c) Prophylactic oral hygiene service (Yes, No, Don't know) (d) Prosthodontics (Yes, No, Don't know)
20. Do you think poor dental conditions such as dental caries or periodontal disease would have an impact on the occlusion? (Yes, No)
21. Do you perceive oral hygiene practice an important issue? (a) Yes (b) No. If 'Yes' why? (a) For personal hygiene (b) To prevent caries (c) To prevent periodontal diseases (d) For aesthetic reasons (e) All of the above (f) Others (indicate) (g) None (h) Don't know