

Attitude toward malocclusion and desire for orthodontic treatment among 9-17 year old Saudis

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الهدف: هدفت الدراسة إلى تحديد مدى اهتمام السعوديين الذين تتراوح أعمارهم ما بين 9-17 سنة بحالة سوء الاطباق عندهم ورغبتهم في المعالجة التقويمية. تصميم الدراسة: أجريت دراسة مستعرضة لعينة شملت 1459 من السعوديين في مرحلة المراهقة وما قبلها، حيث تراحت أعمارهم ما بين 9-17 سنة. مواد الدراسة وطريقتها: أنجزت الدراسة لتحديد الموقف من سوء الاطباق والرغبة في المعالجة التقويمية، حيث أعد استبيان خاص حول الموقف من المعالجة التقويمية. النتائج: كشفت النتائج أن حوالي 31% ممن شملتهم الدراسة كانوا غير راضين عن مظهرهم السني. والأطفال الذين لم يتجاوزوا العاشرة من العمر كانوا الأكثر غير راضي. ودلت النتائج على إيجابية الموقف تجاه مختلف أوجه المعالجة التقويمية مثل مظهر الحاصرات وتحملها. كما أشارت إلى أن حوالي 17% فقط من عناصر الدراسة أشاروا إلى عدم قبول الحاصرات تجميلياً، وحوالي 20% كان لديهم اعتقاد أن المعالجة التقويمية مؤلمة تماماً. ومع أن 92% من عناصر الدراسة اتفقوا على أهمية وجود اطباق صحيح، لكن 69.4% فقط اتفقوا على أهمية تصحيح الاطباق. وحوالي 52% من عناصر الدراسة أشاروا إلى طلب المعالجة التقويمية. ولم يلاحظ أي اختلاف جوهري بين عناصر الدراسة وفقاً لمجموعات الأعمار. الاستنتاج: غالبية المشاركون في الدراسة كان لديهم الاحتمام بخصوص (حول حالة) سوء الاطباق وأبدوا رغبتهم في المعالجة التقويمية كمطلب تجميلي بشكل رئيسي. ولوحظ اختلاف بسيط بين مجموعات الأعمار وذلك فيما يتعلق بدرجة الاستجابة. الكلمات الدليلة: الموقف، سوء الاطباق، سوء الاطباق، احتياجات المعالجة، تقويم الأسنان، مطلب المعالجة.

The objective of the study was to determine the attitude to malocclusion and the desire for orthodontic treatment among 9-17 years old Saudis. A cross-sectional epidemiologically study was carried out in a sample of 1459 pre-adolescent and adolescent Saudi subjects aged 9 to 17 years old. To measure the attitude toward malocclusion and the desire for orthodontic treatment, a questionnaire based on an orthodontic attitude survey was used. The findings revealed that 31% of the subjects were dissatisfied with their dental appearance. Children below the age of 10 years were the most dissatisfied. The results indicated a positive attitude towards various aspects of orthodontic treatment such as braces' appearance and tolerance. However, 17% of the subjects felt that orthodontic braces were ugly and only 20% thought treatment could be quite painful. While a high percentage of the subjects (92%) agreed that proper occlusion is important, only 69.4% of them agreed on the importance of correcting malocclusion. Almost 52% of the subjects indicated a demand for orthodontic treatment. In analysis across age groups, no discernible pattern or statistically significant difference was detected. The majority of the subjects were concerned regarding their malocclusion and showed a desire for orthodontic treatment mainly for aesthetic improvement.

INTRODUCTION

During the last 20 years the Kingdom of Saudi Arabia has had a marked increase in population and a massive development in various aspects of life.¹ Consequently, an increase in the demand for health services including oral health became evident. As growing public interest in oral health increases the demand for orthodontic treatment also became more noticeable in dental practices. Demand for orthodontic therapy may be influenced by a patient's perceived need for treatment and by the anticipated improvement in self-image.^{2,3} Social pressures as well as

cultural and socio-economic background have been reported as reasons for initiating orthodontic treatment.⁴ Thus, knowledge about a lay person's attitude to malocclusion is becoming increasingly important in the context of providing orthodontic treatment. Lew⁵ has stated that "practitioners should focus their attention beyond the orthodontic mechanotherapy to the more subjective aspects of patient discomfort and attitude towards treatment."

Several studies have concentrated on clarifying the role of malocclusion on an individual's perception and satisfaction with dental or facial appearance.⁶⁻⁸ Enhancing

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appearance and improving psychosocial status have been identified as important motivating factors behind the decision to initiate orthodontic treatment.⁹⁻¹⁴ Most of these studies investigated the attitudes of adults or adolescents. Less research on the psychosocial attitude toward malocclusion has been conducted on pre-adolescent children and how this compares with adolescents attitudes.

Knowledge about orthodontic attitudes in pre-adolescents would be beneficial especially since early orthodontic treatment could be advantageous in preventing further malocclusion complications. Furthermore, knowledge about age-related patient concerns may guide and assist the orthodontist in educating potential patients and their parents and in providing advice. A review of the literature has revealed several studies that investigated the prevalence and severity of malocclusion for specific ethnic groups, age distributions and country-specific populations including Saudi Arabia.¹⁵⁻¹⁷ However, no study has yet concentrated on addressing the attitude toward malocclusion and the desire for orthodontic treatment among pre-adolescent and adolescent Saudi subjects. Furthermore, utilization of health services is a matter of concern not only to the providers but also to the planner of health care delivery. Accordingly, estimates of both population perception need and utilization of such services are required. This study was undertaken to determine the attitude towards malocclusion and the desire for orthodontic treatment among 9 to 17 year-old Saudis.

MATERIAL AND METHODS

An epidemiological study on a sub-population of Riyadh City, specifically Saudis aged 9 to 17 years-old, was conducted. A total sample of 1459

subjects was selected from Riyadh public schools from fifth through eleventh grades. A list of all public schools in Riyadh was provided by the Ministry of Education. Together with each school name was included the name of the precinct where the school was located, the number of fifth through eleventh grade classes, the number of the corresponding students, and the school identification number.

A systematic random sampling selection was done to ensure a representation which reflected gender, geographic area and class grades. Two formulated lists, one for boys and one for girls classes within each school were sorted by grade and geographical location. Then proportionately sub-samples were taken from each stratum. For logistical reason, no sub-sampling within class was carried out, as all students from selected classes were taken into the sample.

Data Collection

Demographic data such as sex, age, and were recorded. To measure attitudes toward malocclusion and the desire for orthodontic treatment, a questionnaire was used. Some of the questions used in this study were based on the orthodontic attitude survey¹⁹. The questionnaire included demographic information such as age and sex, and several types of questions measuring a wide spectrum of children's attitudes to their own occlusal status. Pre-testing early draft of the questionnaire on a group of students, who were not included in the study, was conducted and resulted in adjustments of wording and phrasing of the questions. The questionnaire was administered in the Arabic language. The questionnaires were distributed to all students in class. They were completed in the same setting, and then collected. No students refused to complete the questionnaire.

Table 1. Age distribution of sample

Age group*	Frequency	Percent	Cumulative Frequency	Cumulative Percent
9-10	91	6.24	91	6.24
10-11	210	14.39	301	20.63
11-12	216	14.80	517	35.44
12-13	216	14.80	733	50.24
13-14	170	11.65	903	61.89
14-15	184	12.61	1098	74.50
15-16	212	14.53	1299	89.03
16-17	160	10.97	1459	100.00

* The upper value of the interval is closed ended (including that number), whatsoever value is open ended (does not include that number).

Data Analysis

To fulfill the purpose of this study the analyses were primarily descriptive in nature, and involved calculating frequency tabulations, and cross-classifications for categorical data. The statistical tests that were carried out were limited to comparisons of proportions

with the Chi-Square.

RESULTS

Demographics: The age of the present sample ranged from 9 to 17 years with the median age being 13 years. Table 1 presents the age range, profile categorized into groups, with one-year intervals.

Dental Appearance: As a measure of dental appearance satisfaction, the question "do your teeth prevent you from smiling" was asked. Respondents who answered "yes" were 32.6% indicating that they were dissatisfied with their dental appearance. Satisfaction was also analyzed with respect to age. Table 2 shows that there was a consistent level of dissatisfaction (27 – 44%) in the different age groups. Children below the age group of 10 years reported a higher level (44%) of dissatisfaction and children above 16 years reported 36% dissatisfaction. However there was no significant difference among different age group ($P=0.144$).

Table 2. Responses of questionnaires according to age distribution

Questions	Age group								Total	P-Value
	9 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17		
Dissatisfied with dental appearance	36 (44%)	53 (28%)	56 (30%)	58 (30%)	45 (29%)	53 (31%)	54 (27%)	53 (36%)	408 32.6%	0.144
Agree that braces look ugly	11 12.6%	43 20.8%	34 15.9%	30 14.6%	24 14.6%	30 16.9%	33 15.8%	30 19.9%	235 16.6%	0.544*
Agree that could not tolerate braces	22 25.0%	45 21.8%	34 15.9%	47 22.8%	36 21.8%	40 22.5%	34 16.3%	21 13.8%	279 19.7%	0.114
Agree that braces are similar to glasses	35 40.2%	80 38.3%	73 34.3%	79 38.2%	66 39.8%	65 37.1%	67 32.2%	53 34.6%	518 36.5%	0.759
Agree that braces would not be a bother	36 41.4%	81 39.3%	101 47.0%	103 49.8%	86 52.4%	75 42.4%	88 42.5%	68 44.4%	638 45.1%	0.185
Agree about importance of correcting malocclusion	64 71.9%	136 68.3%	138 67.6%	159 77.2%	111 69.8%	111 65.3%	141 68.5%	97 66.4%	957 69.4%	0.783
Agree about the need for orthodontic treatment	44 51.2%	92 46.0%	119 57.5%	115 54.8%	96 58.5%	89 48.9%	92 45.1%	81 52.6%	728 51.7%	0.070

*

Response to Orthodontic Braces: Seventeen percent of the subjects felt that orthodontic braces were ugly. When investigating this issue across different age groups, a fairly constant rate was found (13% - 17%) among the various age groups with the exceptions of the 10 - 11 years old children (20.8%) and those older than the age of 16 (19.9%). Differences observed were not statistically significant ($P=0.544$). Twenty percent responded that the braces could be quite painful. The results revealed that children at the age of 16 years and above expressed a slightly greater tolerance to braces than other age groups (Table 2).

Thirty seven percent of the subject considered having orthodontic braces to correct malocclusion as important as having corrective medical eyeglasses for restoring improper eye vision. The rates across the different age groups were almost similar (Table 2) with no significant statistical differences ($P=0.759$).

For the question whether braces would not bother them, 45% indicated that braces would not bother them. The rates among different age groups varied considerably with a minimum of 39% (10-11 years old) to a maximum of 52% (13-14 years old). There was no discernible pattern across the age groups ($P=0.185$) as shown in Table 2.

Correcting Malocclusion: The finding revealed that 92% of the subjects agreed that proper

occlusion was important. However, when asked about the importance of correcting malocclusion, 69.4% reported that correcting malocclusion was important while the remaining were indifferent to its importance. Almost similar percentages of positive responses to the importance of correcting malocclusion were found across the different age groups, with a slight increase in the percentage of positive response in the group of 12-13 year old children (77.2%) as shown in Table 2.

Relative Value of Treatment: As another way to evaluate the value of orthodontic treatment, the subjects were presented the choice of orthodontic treatment versus taking a vacation. Only 25.1% of subjects responded that they would postpone orthodontic treatment in favor of taking a vacation, if for financial reasons, a decision had to be made. With regard to the different age groups the rates varied considerably between 15.7% in the 9-10 year old age group to 35.4% in the 14-15 year old age group (Table 3). There was statistically significant relationship between age-groups and this question ($P<0.0001$).

Desire for Orthodontic Treatment: When subjects were asked “do you demand orthodontic treatment”, 51.7% of the subjects indicated “yes”. When

Table 3. Response to “choice of orthodontic treatment vs. taking vacation” according to age group.

	9 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	TOTAL
Vacation	13 15.7%	35 17.2%	60 29.1%	42 20.5%	53 32.5%	62 35.4%	53 26.2%	31 20.4%	349 25.1%
Ortho Tx	70 84.3%	168 82.8%	146 70.9%	163 79.5%	110 67.5%	113 64.6%	149 73.8%	121 79.6%	1040 74.9%
TOTAL	83 6.0%	203 14.6%	206 14.8%	205 14.8%	163 11.7%	175 12.6%	202 14.5%	152 10.9%	1389 100%

$P<0.0001$

Table 4. Reasons for selecting orthodontic treatment.

Reasons	Number	Percentage
Esthetics	316	41.3%
Proper occlusion	240	31.3%
Able to chew	110	14.4%
Self-confidence	80	10.5%
Similar to friends	20	2.6%

investigating the response rates across the age groups, the maximum positive response rate was found in the 13-14 year-old age group (58.5%) and the minimum in the 15-16 year old age group (45.1%). There was variation in the rates across the different age groups (Table 2) but no discernible pattern was observed.

When the subjects were asked to identify the main reason justifying the desire for orthodontic treatment, aesthetics was the main reason chosen (41.3%), followed by proper occlusion (31.3%), ability to chew (14.3%), self-confidence (10.5%), and imitating friends (2.6%) as shown in Table 4. In reviewing the percentages across the age groups, the only detectable trend was that associated with aesthetics. The rate increased in the older age groups compared to the younger age groups.

DISCUSSION

The present sample was randomly selected from the Riyadh public school system through a statistically designed method. The city of Riyadh is the capital of Saudi Arabia and is similar to other capitals of the world where people have migrated from different parts of the country to live in the capital. Therefore, it can be assumed that Riyadh is relatively representative of the whole of Saudi Arabia.

Although age-related changes in malocclusion concerns ideally should

be studied longitudinally, the present study allowed comparison between different age groups by means of a cross-sectional study. Such a study can give an indication of changing attitudes toward malocclusion with age.

A child's perception for his or her dental appearance is of considerable importance in determining both treatment demand and the subsequent level of cooperation during treatment. Dissatisfaction with dental appearance was reported by 31% of the sample. This findings is similar to Esplenad and Stenvick study⁸, where information was collected on children satisfaction with their dental appearance and desire for orthodontic treatment.

Knowledge about age-related attitudes to dental appearance may guide efforts in assisting the education of potential patients. Newman *et al.*²⁰ reported in their study that satisfaction with appearance was strongly influenced by age. This trend was not detected in this study. There was a higher level of dissatisfaction among 9-10 years old children. However, it was not statistically significant. It could be due to "the ugly duckling stage" as mentioned by Broodbent.²¹

The attitudes of subjects towards various aspects of treatment such as braces' appearance and tolerance were assessed. Results indicated a positive attitude towards various aspects of treatment. This result is in agreement with Gavely and Orth²² who reported that students were prepared to accept treatment and to wear the appliances especially when treatment level needed increases. A further indication of the positive attitude of the sample in this study was provided when the relative value of orthodontic treatment was investigated. Approximately 75% of subjects responded that they would postpone a vacation in favor of orthodontic treatment if, for financial reasons, a decision had to be made.

A high percentage of the present sample (92%) agreed that proper occlusion was essential. However, only 69.4% of them felt that correcting malocclusion was important. From these findings, it could be concluded that although the majority of the subjects had a negative attitude toward malocclusion, some did not value the importance of correcting malocclusion when it come to carrying out orthodontic treatment and/or that the young patient themselves often did not contribute to treatment decision. This detached opinion and/or lack of concern for correcting malocclusion among children had also been observed by other investigators.^{23,24}

The data revealed that desire for orthodontic treatment among subjects in the sample was high. Approximately 52% of the subjects indicated a demand for treatment while only 31% of subjects reported dissatisfaction with their dental appearance. This finding suggests that, although some subjects were generally satisfied with their dental appearance, they still tended to desire orthodontic treatment, perhaps for slight malalignment of teeth. Similar findings were reported by Malmgren²⁵ who studied 147 children of a comparable age group. He found that 89 children (60.5%) were dissatisfied with their dental appearance, but, 74.8% thought that their teeth needed correction. Malmgren²⁵ speculated that this discrepancy between children dissatisfied with their teeth and those who thought they required orthodontic treatment might have been due to either a failure to understand the questions passed or that the children wanted to be treated even though they were not certain that there was something wrong with their teeth. In contrast to this, Tulloch *et al.*²⁶ showed that perception of dental attractiveness and treatment need were similar. Other studies^{8,27} measuring orofacial perceptions in

teenagers or adults indicated that, while people seemed mostly aware of their malocclusion traits, they did not perceive a need for treatment.

Esthetics was the main reason given in the present study for justifying the need for orthodontic treatment, followed by proper occlusion and the ability to chew. This is in agreement with many investigators who reported that dental appearance was the main motive for seeking orthodontic care.¹¹⁻¹³ Salzmann¹¹ has stated that demand for orthodontic treatment was motivated primarily by "esthetic values as well as by the high social premium our society places as well aligned teeth and attractiveness in general". Further supportive evidence for this view is provided by Gochman¹³ in his study of 774 schoolchildren aged 8-17 years-old, where a large proportion of the sample mentioned social improvements, appearance, and self-confidence as the major benefits of the treatment. Moreover, the need for treatment to improve esthetics in the present study was found to increase with age. This is in agreement with that of Gochman.¹³ It appears, therefore, that many people seek treatment for a mixture of reasons, with the primary motivation being the need for acceptable dento-facial appearance.

When reviewing the attitude toward malocclusion and the desire for orthodontic treatment across the different age groups in this study, some variations in the rate of positive responses across the different age groups were found. However no discernible pattern or statistically difference could be detected. Further evidence in this direction is supplied by Gross and Gross²⁸ who reported that different age groups did not differ significantly.

No clinical examination was conducted in this study. Thus, no correlation between satisfaction of dental appearance

and perception of orthodontic treatment needs relative to various occlusal traits was measured. Conflicting results regarding the effects of various occlusal traits on concern for dental appearance have been reported in the literature. For example, Helm *et al.*²⁹ found that certain occlusal traits, such as extreme overjet and reverse overjet, were causes for concern. In contrast to this, other studies^{8,24-27} have suggested that self perception and clinical findings were poorly correlated.

These conflicting results mentioned emphasize and highlight the need to establish exactly what the patients dislike most about their appearance. Therefore, further investigations of what clinical parameters and what levels of malocclusion severity lead to demand for orthodontic treatment are needed to have a better understanding of the attitude towards malocclusion and the perception of treatment need. Another issue which should be addressed is the fact that it is usually a parent who brings a child for both dental and orthodontic care. Thus, an understanding of the role of parents' perceptions of the child's appearance must be considered from the standpoint of treatment.

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