Self-perception of dental appearance and aesthetics in a student population

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Available online: 26 June 2019

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Keywords
Self-perception
Dental appearance
Dental aesthetics

Summary

Objective > To assess the perception of personal dental appearance and dental aesthetics of a young adult population and to compare this with their normatively assessed orthodontic treatment need.

Materials and methods > This was a cross-sectional study involving 420 undergraduate students aged 18-30 years, with no previous history of orthodontic treatment. Objective assessment of dental aesthetics was carried out using the aesthetic component of the Index of Orthodontic Treatment Need (IOTN), while self-administered questionnaires were used to assess perception of personal dental appearance.

Results > Over 90% of the students considered healthy and well-arranged teeth to be important to their appearance, however, only 36% of them were satisfied with their dental aesthetics. In addition, three-quarters (75%) of the students reported that they desired to change the appearance of their teeth, majority (56.5%) wanted to change the colour, whilst 31.2% wanted to change the arrangement of their teeth (31.2%). A statistically significant association ($P = 0.05$) was recorded between the level of satisfaction with their dental aesthetics and an objective assessment by an orthodontist.

Conclusion > The two most important features in the perception of their personal dental appearance, for this young adult population, were the 'colour' and 'arrangement' of their teeth. There was a statistically significant association between their satisfaction with their dental aesthetics and their normatively assessed orthodontic treatment need, although no correlation was observed between both variables.
Résumé
Auto-perception de l'apparence et de l'esthétique dentaire chez une population étudiante

Objectif > Évaluer l'auto-perception de l'apparence et de l'esthétique dentaire d'une population de jeunes adultes et la comparer au besoin objectif de suivre un traitement orthodontique.

Matériel et méthodes > Il s'agit d'une étude transversale portant sur 420 étudiants de premier cycle âgés de 18 à 30 ans et n'ayant aucun antécédent de traitement orthodontique. Une évaluation objective de l'esthétique dentaire a été effectuée à l'aide de la composante esthétique de l'Indice de besoin de traitement orthodontique (IOTN), tandis que des questionnaires auto-administrés ont été utilisés pour évaluer la perception de l'apparence dentaire qu'ils ont d'eux-mêmes.

Résultats > Plus de 90 % des étudiants considèrent que des dents saines et bien disposées sont importantes pour leur apparence physique, mais seulement 36 % d'entre eux sont satisfaits de leur esthétique dentaire. De plus, les trois quarts (75 %) des étudiants ont indiqué qu'ils désiraient changer l'aspect de leurs dents, la majorité (56,5 %) voulait changer la couleur, tandis que 31,2 % voulaient changer la position de leurs dents (31,2 %). Une association statistiquement significative (p = 0,05) a été enregistrée entre le niveau de satisfaction à l'égard de leur esthétique dentaire et l'évaluation orthodontique objective.

Conclusion > Pour cette population de jeunes adultes, les deux caractéristiques les plus importantes dans leur auto-appréciation dentaire étaient la « couleur » et la « disposition » de leurs dents. Une association statistiquement significative a été établie entre leur satisfaction à l'égard de leur esthétique dentaire et leur besoin objectif de traitement orthodontique bien qu'aucune corrélation n'ait été observée entre les deux variables.

Introduction

Facial aesthetics affect not only how people are perceived by society but also how they perceive themselves [1]. The appearance of the teeth and an individual’s smile are critical components of facial attractiveness [2]. Indeed, the oro-facial region is usually an area of significant concern for many individuals because it draws the most attention in interpersonal interactions and is the primary source of vocal, physical, and emotional communication [3].

An ‘unpleasant dental appearance’ due to a mal-alignment of the teeth and/or the jaws can be defined as a malocclusion. This may be a source of stigmatization, hinder professional achievement, encourage negative stereotypes and have a negative effect on self-esteem [1,4,5]. Malocclusion differs from the majority of medical and dental conditions in that it is ‘a set of dental deviations’ rather than a disease, and orthodontic treatment does not cure a condition but rather corrects variations from an arbitrary norm [6,7]. This has led to debates about defining the point at which the extent of variation means that orthodontic treatment is desirable [8]. In addition, it has also been suggested that the majority of oral health measures developed in dentistry are not applicable to orthodontic patients because most malocclusions are asymptomatic and related to aesthetic challenges, as opposed to loss of function [7,9].

Furthermore, malocclusion may be perceived differently by the affected person thus the degree of awareness might not be related to its severity [10]. When evaluating the impact of malocclusion, it is important to consider the different domains that can be affected and their relationships to the severity of the malocclusion [11].

In a study carried out among Turkish University students to compare the awareness of their malocclusion with objectively determined orthodontic need using the Dental Aesthetic Index, it was reported that there was no agreement between the two variables. The DAI and satisfaction with dental appearance were found to be different from each other [12]. Studies carried out in Nigerian populations have also reported differences between normatively assessed dental aesthetics and satisfaction with the dental appearance of the participants [13-15]. In one of these studies [15], a pretested questionnaire was used to assess the subjects’ awareness of malocclusion and satisfaction with personal dental appearance, while the actual severity of the malocclusion was determined by using the DAI, performed by the orthodontist in a school environment. The results of the study showed that Nigerian adolescents’ consciousness of their malocclusion, did not agree with their objectively determined orthodontic need [15]. However, most studies carried out in this area have been limited to children and adolescent
populations in this environment, while very few studies on this have been carried out in adults.

Considering the fact that a larger percentage of young adult patients are seeking orthodontic treatment in this environment [16], the importance of such studies cannot be overemphasized. In a previous study, the authors had compared the impacts of self-perceived and normatively assessed dental aesthetics on the oral health-related quality of life of young adults. However, in that study, dental aesthetics were assessed using only the Aesthetic component of the Index of Orthodontic Treatment Need, without taking into consideration the perceptions of personal dental appearance of the study population [17]. Thus, this is a follow-up study carried out in the same population, with the aim to assess the perception of personal dental appearance of a young adult population and to compare this with their normatively assessed orthodontic treatment need.

Materials and methods
Ethical approval for the study was obtained from the Health Research Ethics Committee (ADM/DCST/HREC/1351) of the Lagos University Teaching Hospital, Lagos, Nigeria and permission to carry out the study was also obtained from the Student Affairs Office of the University of Lagos. In addition, informed written consent was obtained from all students selected to participate in the study after the study had been fully explained to them.

This was a cross-sectional study, involving undergraduate students of the University of Lagos, Nigeria aged 18–30 years, with no previous history of orthodontic treatment. A total of 420 undergraduate students of the university, from four randomly selected halls of residence (two male and two female halls) participated in the study.

Data was collected through self-administered questionnaires, which were distributed and collected the same day. The questions were modified from a previous study [18]. Satisfaction with dental aesthetics was evaluated with three questions with fixed alternative answers, while attitude to orthodontic treatment was also assessed with two questions in likewise manner. Dental examinations were performed by two orthodontists using a wooden tongue depressor, under natural light with the subject in sitting position on a chair. The objective orthodontic treatment need of the students was assessed using the aesthetic component of the Index of Orthodontic Treatment Need (IOTN) by the orthodontists [19]. The aesthetic component of the IOTN records any aesthetic impairment through a 10-point photograph scale with progressive degrees of aesthetic problems, ranging from 1 (most attractive) to 10 (least attractive). The Orthodontist would select the photograph, which most closely represented the attractiveness of the students’ dental appearance. The dental examinations and diagnostic criteria followed the World Health Organization (WHO) recommendations for oral health survey [20].

Reliability
Two orthodontists were involved in determining the normatively assessed dental aesthetics of the students. Thus, to assess for inter-examiner reliability, both orthodontists independently examined ten students using the AC component of the IOTN, before the commencement of the study. A weighted kappa score of 0.7 was recorded showing good agreement, between both examiners. Intra-examiner reliability for both examiners were also recorded to give weighted kappa scores greater than 0.7 [21].

Statistical analysis
Participants were categorized into groups based on their IOTN AC scores. The AC scale of the IOTN was collapsed from a 10 point-scale to a 3 point-scale. Photographs 1 to 4 representing ‘no need for treatment’, 5 to 7 borderline need for treatment and 8 to 10 definite need for treatment, on aesthetic grounds [19]. Descriptive statistics were used to describe the students’ age, and while Fisher’s exact tests were used to assess for relationships between their perceptions of their dental appearance as compared to normative assessments. The level of significance was set at $P < 0.05$.

Results
The final study sample was made up of 375 students, with a mean age of 21.97 ± 2.97 years and a modal age of 21 years. Male-female ratio was 1:1.4, with 200 males (55%) and 175 females (45%). Forty-five students returned questionnaires with incomplete data, thus their information was not part of the final data analysis.

Table I shows the subjective assessment of dental aesthetics by the respondents. Almost all the students (95.5%) felt that healthy and well-arranged teeth were important to their appearance. However, only 35.7% (134) were satisfied with their dental aesthetics and 40% (150) were not. A significantly greater percentage of females (42.9%, 75) were satisfied with their dental aesthetics than the males (29.5%, 59).

About three-quarters of the students (75.7%, 284) indicated that they would like to change something about the appearance of their teeth, while (14.1%, 53) indicated otherwise. No significant gender differences were observed ($P > 0.05$). When asked what they would like to change about their teeth, 56.3% (211) reported that they would like to change the colour, and 31.2% wanted to change the arrangement of their teeth. Only 4.8% reported that they would like to change the size of their teeth. No significant gender differences were observed with respect to what the respondents wanted to change about their teeth.

Table II shows the attitude to orthodontic treatment of the respondents. A significantly greater number of males (55.5%) than females (42.9%) thought that they should have orthodontic treatment ($P < 0.05$). Furthermore, a significantly greater percentage of males (79.5%) than females (63.4%) indicated that they would be willing to undergo orthodontic treatment if it were recommended by a dentist ($P < 0.05$).
Table I
Subjective assessment of aesthetics.

<table>
<thead>
<tr>
<th>Do you think healthy and well-arranged teeth are important for your appearance?</th>
<th>Male (n = 200)</th>
<th>Female (n = 175)</th>
<th>Total (n = 375)</th>
<th>Fisher's Exact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>196</td>
<td>98</td>
<td>164</td>
<td>93.7</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>1.0</td>
<td>7</td>
<td>4.0</td>
</tr>
<tr>
<td>Do not know</td>
<td>2</td>
<td>1.0</td>
<td>4</td>
<td>2.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Are you satisfied with your dental aesthetics?</th>
<th>Male (n = 200)</th>
<th>Female (n = 175)</th>
<th>Total (n = 375)</th>
<th>Fisher's Exact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>110</td>
<td>55.0</td>
<td>75</td>
<td>42.9</td>
</tr>
<tr>
<td>No</td>
<td>22</td>
<td>11.0</td>
<td>30</td>
<td>17.1</td>
</tr>
<tr>
<td>Do not know</td>
<td>68</td>
<td>34.0</td>
<td>70</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is there anything you would like to change about your teeth?</th>
<th>Male (n = 200)</th>
<th>Female (n = 175)</th>
<th>Total (n = 375)</th>
<th>Fisher's Exact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>115</td>
<td>57.5</td>
<td>96</td>
<td>54.9</td>
</tr>
<tr>
<td>Size</td>
<td>10</td>
<td>5.0</td>
<td>8</td>
<td>4.6</td>
</tr>
<tr>
<td>Arrangement</td>
<td>58</td>
<td>29.0</td>
<td>59</td>
<td>33.7</td>
</tr>
<tr>
<td>Others</td>
<td>17</td>
<td>8.5</td>
<td>12</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Table III shows that a statistically significant relationship was recorded between the self-perceived orthodontic treatment need of the students and their willingness to undergo orthodontic treatment if recommended by a dentist ($P < 0.05$). A positive and significant correlation was also recorded for both variables ($r = 0.115, P < 0.05$).

Table IV shows that a statistically significant relationship ($P < 0.05$) was recorded between the professionally assessed

Table II
Attitude to orthodontic treatment.

<table>
<thead>
<tr>
<th>Do you think you should have orthodontic treatment?</th>
<th>Male (n = 200)</th>
<th>Female (n = 175)</th>
<th>Total (n = 375)</th>
<th>Fisher's Exact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>110</td>
<td>55.0</td>
<td>75</td>
<td>42.9</td>
</tr>
<tr>
<td>No</td>
<td>22</td>
<td>11.0</td>
<td>30</td>
<td>17.1</td>
</tr>
<tr>
<td>Do not know</td>
<td>68</td>
<td>34.0</td>
<td>70</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Would you readily agree to orthodontic treatment if a dentist suggested it?</th>
<th>Male (n = 200)</th>
<th>Female (n = 175)</th>
<th>Total (n = 375)</th>
<th>Fisher's Exact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>159</td>
<td>79.5</td>
<td>111</td>
<td>63.4</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>4.5</td>
<td>11</td>
<td>6.3</td>
</tr>
<tr>
<td>Do not know</td>
<td>32</td>
<td>16.0</td>
<td>53</td>
<td>30.3</td>
</tr>
</tbody>
</table>

$P < 0.05$. 

Self-perception of dental appearance and aesthetics in a student population
dental aesthetics of the students and their satisfaction with their dental aesthetics. However, there was no significant correlation recorded between both variables \( r = -0.159, P > 0.05 \).

**Discussion**

The importance of taking into consideration the patient’s perception of their dental appearance cannot be overemphasized, as it has previously been reported that this is of great significance in orthodontic treatment planning, particularly for young adult populations [17]. Almost all the study participants were in agreement that healthy and well-arranged teeth are important to the general health of the body. This is a reflection of the fact that young adults place a great importance on their dental appearance and may be partly responsible for the increasing percentage of adult patients now seeking orthodontic treatment [16,22]. Only a third of the students were satisfied with their dental aesthetics and this is relatively low compared with similar studies carried out in other adult populations. Studies carried out among Malaysian adults recorded a satisfaction level of 47.2% [23], while others in Turkish [24] and British [25] populations, reported values of 57.3% and 76%, respectively. However, these differences may be explained by the fact that perceptions of dental appearance vary across different cultures and populations [26-28]. It is interesting to note that a significantly greater percentage of females were satisfied with their dental aesthetics than the males. A reverse result would have been expected, bearing in mind that females are often more critical of their dental aesthetics as this has been previously reported [23,29-33]. No significant gender differences were observed in a previous study carried out among adolescents in the same population, in which the aesthetic component of the IOTN was the only instrument used [34]. This was also the case in a study carried out among Peruvian University Students [35]. However, in this study the male students were much more critical of their dental aesthetics than the females. This may be as a result of greater consciousness among the young adult males in the study, about their dental appearance. Similar findings have been reported in studies carried out among young adult Brazilian soldiers [21], Jordanian adolescents [28] and Swedish males [36].

**Table III**

Association between self-perceived orthodontic treatment need and willingness to undergo orthodontic treatment if recommended by a dentist.

<table>
<thead>
<tr>
<th>Self-perceived orthodontic treatment need</th>
<th>Yes ( n (%) )</th>
<th>No ( n (%) )</th>
<th>Do not know ( n (%) )</th>
<th>Total ( n (%) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>167 (61.9)</td>
<td>1 (5.0)</td>
<td>17 (20.0)</td>
<td>185 (49.3)</td>
</tr>
<tr>
<td>No</td>
<td>29 (10.7)</td>
<td>14 (70.0)</td>
<td>9 (10.6)</td>
<td>52 (13.9)</td>
</tr>
<tr>
<td>Do not know</td>
<td>74 (27.4)</td>
<td>5 (25.0)</td>
<td>59 (69.4)</td>
<td>138 (36.8)</td>
</tr>
<tr>
<td>Total</td>
<td>270 (100.0)</td>
<td>20 (100.0)</td>
<td>85 (100.0)</td>
<td>375 (100.0)</td>
</tr>
</tbody>
</table>

Fisher’s exact = 0.000, Spearman’s correlation: \( r = 0.115, P = 0.026 \) (2 tailed).

**Table IV**

Association between professionally assessed dental aesthetics and students’ satisfaction with their dental aesthetics.

<table>
<thead>
<tr>
<th>Professional assessment of dental aesthetics</th>
<th>Yes ( n (%) )</th>
<th>No ( n (%) )</th>
<th>Do not know ( n (%) )</th>
<th>Total ( n (%) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>No need</td>
<td>122 (91.0)</td>
<td>120 (80.0)</td>
<td>82 (90.1)</td>
<td>324 (86.4)</td>
</tr>
<tr>
<td>Moderate need</td>
<td>11 (8.2)</td>
<td>28 (18.7)</td>
<td>7 (7.7)</td>
<td>46 (12.3)</td>
</tr>
<tr>
<td>Definite need</td>
<td>1 (0.7)</td>
<td>2 (1.3)</td>
<td>2 (2.2)</td>
<td>5 (1.3)</td>
</tr>
<tr>
<td>Total</td>
<td>134 (100.0)</td>
<td>150 (100.0)</td>
<td>91 (100.0)</td>
<td>375 (100.0)</td>
</tr>
</tbody>
</table>

Fisher’s exact = 0.000, Spearman’s correlation: \( r = -0.159, P > 0.05 \) (2 tailed).
Findings from this study imply that tooth colour was the primary reason for respondents’ dissatisfaction with their dental appearance. About three-quarters of the students wanted to change something about the appearance of their teeth with at least half of the students (56.3%) wanting to change the colour of their teeth. This may explain the reason why tooth whitening is a very commonly sought after aesthetic dental treatment among adult patients. A similar finding was reported in a study carried out among Malaysian adults, in which 56.2% were dissatisfied with the colour of their teeth [23]. This finding has also been reported in other studies [23,30].

The second most reported factor influencing satisfaction with dental appearance among young adults in this study was the arrangement of their teeth. About a third of the students (31.2%) wanted to correct the arrangement of their teeth which, is in agreement with a similar study carried out among Malaysian adults (32.3%) [23]. However, it is also interesting to note that almost half of the students (49.3%), with a significantly greater percentage of males than females, indicated that they thought they required orthodontic treatment. This may also be as a result of a greater consciousness of the young adult males about their dental appearance, which has been previously highlighted. A significantly greater percentage of the students (75%) indicated willingness to undergo orthodontic treatment if it was recommended by a dentist as against those who had reported a self-perceived need for treatment (49.3%). A similar finding was reported in a study carried out among adolescents [18]. It is instructive to note that 10% of the patients who indicated their willingness to undertake orthodontic treatment if professionally recommended, had previously expressed no self-perceived orthodontic treatment need, while 27% had previously indicated that they did not know if they required orthodontic treatment. This finding reflects the importance of normative assessments and recommendation of treatment need by a dentist or orthodontist, to the uptake of orthodontic treatment by young adult patients. Furthermore, the statistically significant association and correlation recorded between self-perceived treatment need and normatively recommended treatment highlight the important relationship between both variables.

The statistically significant relationship between the normatively assessed dental aesthetics and satisfaction with dental aesthetics is quite understandable bearing in mind that it has previously been reported that self-perceived orthodontic need, may be an indication of actual treatment need [17,28,34,36]. It is instructive to note that 90% of the respondents who were satisfied with their dental aesthetics had no normative treatment need, while 80% of those who were dissatisfied with their dental aesthetics were also classified as having no normative treatment need. This finding reinforces the fact that individual perceptions of malocclusion and dental aesthetics may differ for different individuals [10]. However, this variation may also most likely be attributed to the large percentage of individuals who were actually dissatisfied with other aspects of their dental aesthetics (68.8%), apart from their occlusion e.g. tooth colour. This explains the absence of any correlation between satisfaction with dental aesthetics and normatively assessed treatment needs using the IOTN. This is in contrast to the findings of a previous study in the same population where a weak correlation was observed between the self-perceived and normatively assessed dental aesthetics using the AC component of IOTN [17]. This finding is further explained by the fact that the IOTN (which was used for normative assessment in this study) is a measure of orthodontic treatment need and does not focus on other aspects of dental aesthetics such as tooth colour. The findings from this study re-emphasize the importance of taking into serious consideration, the patient’s perception of their dental aesthetics in the treatment planning process, particularly for young adult patients [37]. This would go a long way in ensuring that the most appropriate treatment plan is chosen, to deliver treatment outcomes that would be of great benefit to the patient, while also addressing other normatively assessed dental aesthetic deficiencies the patient may have.

Conclusion

A statistically significant relationship was recorded between the students’ satisfaction with their dental aesthetics and their normatively assessed orthodontic treatment need. The two most important features in the perception of their personal dental appearance, for this young adult population, were the ‘colour’ and ‘arrangement’ of their teeth.

Disclosure of interest: the authors declare that they have no competing interest.

References


