Perception of facial profile and orthodontic treatment outcome - importance of patient’s opinion in treatment plan

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Abstract

Aim: The aim of this study was to evaluate the accuracy in the perception of the own facial profile by subjects and to compare the orthodontist’s perception of attractive profile with those of laypeople and dental students.

Materials and Methods: In this study, 180 subjects (90 dental students and 90 laypeople) from Riyadh province of Saudi Arabia were evaluated by a questionnaire. The questionnaire was designed to find out the most attractive profile among the two groups, the perception of own facial profile and expectations of subjects from orthodontic treatment. The facial profiles of the individuals were evaluated by two clinicians separately. The differences among groups in the perception of the own profile were compared by using Chi-square (χ²) test. Kappa coefficient was used to assess the agreement between the two groups. For all statistical analysis P < 0.05 was set as the significance level.

Results: The most attractive profile perceived by both the groups was Class I, followed by straight profile and least attractive was Class III profile with the protrusive mandible. The difference in the profile perception between the clinicians and subjects was statistically significant (P < 0.05).

Conclusion: The most attractive profile perceived by both the groups was Class I, followed by straight profile dental students were more accurate in the perception of the own profile. The expected profile of patients after orthodontic treatment is not same for all the subjects.

Keywords
Facial profile, perception, protrusive

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Introduction

Facial attractiveness has long been a desirable physical characteristic in all societies for many centuries. Orthodontic treatment can influence facial esthetics in a number of ways, including well-aligned teeth an attractive smile, and a pleasing facial profile. The orthodontist “for each of his efforts, whether he realizes it or not, makes for beauty or ugliness, for harmony or disharmony or for perfection or deformity of the face.” Thus, the contribution of orthodontics and orthognathic surgery to the esthetic well-being of individuals cannot be ignored.

As Plato said, “beauty lies in the eyes of the beholder.” There appears to be a great variation in perception of beauty among individuals, as well as communities and countries.

Perception has been defined as the process by which patterns of environmental stimuli are organized and interpreted; it can be influenced by a variety of physical, physiological, and social factors. Several studies have been conducted on the perception of facial profile attractiveness.

Previous studies that were limited to certain ethnic and racial groups included very small or biased sample sizes, and the relationship between the size of the profile change, and attractiveness was not fully examined.

Finally but most important, treatment planning must be an interactive process. No longer can the doctor decide, in a paternalistic way, what is best for a patient. Both ethically and practically, patients must be involved in the decision-making process. Ethically patients have the right to control what
happens to them in treatment-treatment is something done for them, not to them. Hence, in spite of proper treatment planning by the clinician, the patient may not be satisfied because the clinician did not take into account the patient’s perception of their appearance. The clinical success to treat because the clinician did not take into account the patient’s planning by the clinician, the patient may not be satisfied.

An orthodontist perception of an attractive facial profile depends upon the values or numbers, which were determined by studies conducted on specific populations. It is not fair to apply the same values for various populations because there may be differences in opinion in the perception of esthetic profile among others. Therefore, many studies have evaluated the perception of attractiveness and profile standards of Caucasians and African Americans, Japanese, Turkish, and Chinese but not on Riyadh population of Saudi Arabia.

This study was designed to evaluate the accuracy in the perception of the own facial profile by subjects and to compare the orthodontist’s perception of attractive profile with those of laypeople and dental students.

**Materials and Methods**

The sample selection was done by a simple random sampling method. The total sample size of the study was 180, which was divided into two groups.

**Group I: Dental students.**

**Group II: Laypeople.**

The age of the participants was 18-35 years old. The inclusion criteria include the absence of apparent facial deformities, any syndrome, facial asymmetry, psychological problems. The subjects who had undergone or undergoing orthodontic treatment were not included in the study. The dental student group comprised of subjects from College of Dentistry, Zulfi, Majmaah University, Riyadh province, Kingdom of Saudi Arabia. The laypeople group comprised of subjects randomly selected from the same region.

Individuals were given a questionnaire with silhouettes [Figure 1] representing Class I, Class II, Class I bimaxillary protrusion, and Class III and straight facial profile. It was a questionnaire study. They were asked that whether they notice any person’s face from lateral side (profile view) and to choose most attractive facial profile according to them, to choose the facial profile from the silhouettes that resembles to their facial profile, whether they felt that facial profile contributes to the facial beauty and which structures among nose, upper lip, lower lip, and chin contributes to facial esthetics. It was enquired that whether they were happy with their facial profile and if they want undergo orthodontic treatment and if yes then which type of facial profile they would like to have after orthodontic treatment. Only completely, filled questionnaires were evaluated for the analysis.

The facial profile of the subjects was evaluated independently by two specialists to evaluate whether the participants were accurate in identifying their profile accurately. The agreement between two observers was evaluated by kappa test. The differences among the groups in identifying their facial profile were compared by using chi-square test ($\chi^2$), $P < 0.05$ was considered as statistically significant.

**Result**

All the subjects included in this study were in agreement that facial profile plays an important role in facial esthetics.

The results of this study depicts that the most attractive facial profile is Class I (73.33%) followed by straight profile (20.55%), Class I bimaxillary dentoalveolar protrusion (3.88%) and Class II (2.22%). Class III profile were found to be least attractive (0%) [Table 1 and Graph 1].

The two groups included in this study were different in their ability to identify or perceive their profile. The dental student group was more accurate (82.22%, $k = 0.83$) in identifying their profile as compared to laypeople group (30%, $k = 0.87$). It was found that the difference in agreement on profile between laypeople and orthodontist was significant ($P < 0.05$) [Table 2 and Graph 2].

In this study, it was found that 68.89% of dental students and 36.36% of laypeople were not happy by their facial profile. After treatment, it was noticed that 48% of dental students and 57.58% of laypeople want to undergo orthodontic treatment to improve their facial profile [Table 3 and Graph 3].

![Figure 1](image.png)

**Figure 1:** Silhouettes representing, (a) Class I, (b) Class II, (c) Class I bimaxillary protrusion, (d) Class III, (e) straight profile
This study showed that 85.48% of dental students and 57.58% of laypeople want to undergo orthodontic treatment to change their facial profile [Table 4 and Graph 4]. After treatment 62.26% of dental students and 42.11% of laypeople subjects like to have Class I profile after treatment. 33.96% of dental students and 57.89% of laypeople like to have straight profile after treatment [Table 5 and Graph 5].

The subjects in this study from laypeople group felt that upper and lower lip is more important in esthetic profile whereas dental students said that along with the lips, nose also plays an important role in facial esthetics.

**Discussion**

Medical and dental interventions that are intended to make the individual either “better than well” or “beyond normal” are called enhancements. Examples of typical medical and surgical enhancements are drugs to treat erectile dysfunction, face lifts, and hair transplants. In this context, orthodontics often can be considered an enhancement technology.[8]

In recent times, increased awareness has made facial esthetics one of the most important factors due to which patients acquired orthodontic treatment. It is also relative to their popularity and success especially in the teens and young adults.[14-16] One of the main aims of orthodontic treatment is facial esthetics however, the patient’s perception of esthetic face depends on the social and cultural rules of the society whereas the orthodontist prefers to use scientifically derived

**Table 1:** Distribution of most attractive profile according to subjects in dental and laypeople group  

<table>
<thead>
<tr>
<th>Group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>78.89</td>
<td>0.00</td>
<td>4.44</td>
<td>0.00</td>
<td>16.67</td>
</tr>
<tr>
<td>II</td>
<td>67.78</td>
<td>4.44</td>
<td>3.33</td>
<td>0.00</td>
<td>24.44</td>
</tr>
</tbody>
</table>

**Table 2:** Accuracy in profile judgment by subjects of dental student and laypeople group (%)  

<table>
<thead>
<tr>
<th>Group</th>
<th>Similar</th>
<th>Not similar</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>82.22</td>
<td>17.78</td>
</tr>
<tr>
<td>II</td>
<td>30.00</td>
<td>70.00</td>
</tr>
</tbody>
</table>

**Table 3:** Subjects were happy of not happy by their facial (%)  

<table>
<thead>
<tr>
<th>Group</th>
<th>Happy</th>
<th>Not happy</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>31.11</td>
<td>68.89</td>
</tr>
<tr>
<td>II</td>
<td>63.33</td>
<td>36.67</td>
</tr>
</tbody>
</table>

**Table 4:** Subjects want to undergo orthodontic treatment in dental student and laypeople group (%)  

<table>
<thead>
<tr>
<th>Group</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>85.48</td>
<td>14.52</td>
</tr>
<tr>
<td>II</td>
<td>57.58</td>
<td>42.42</td>
</tr>
</tbody>
</table>

**Table 5:** Expected facial profile after orthodontic treatment suggested by dental students and laypeople (%)  

<table>
<thead>
<tr>
<th>Group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>62.26</td>
<td>3.77</td>
<td>0</td>
<td>0</td>
<td>33.96</td>
</tr>
<tr>
<td>II</td>
<td>42.11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>57.89</td>
</tr>
</tbody>
</table>
The superimposition technique acknowledges that the size of the patient’s nose is a key factor in actual visualized, profile perceptions (e.g. a patient with a large nose and a moderate mandibular deficiency may appear to have a severe mandibular deficiency when viewed in profile because of nasal dominance.\[27\] Hence, the prominent nose of these subjects should be considered during treatment planning because the retraction of teeth increases the nasolabial angle, which increases the relative nose prominence, and the treatment results will be unesthetic.

There is a significant difference ($P < 0.05$) inaccuracy in the judgment of own facial profile between dental students and laypeople. Group I was more accurate in identifying their own profiles ($82.22\%, k = 0.83$) than Group II ($30\%, k = 0.87$) the group of dental students were more aware of esthetics due the dental education.\[26\] Hence, this group was significantly different in identifying their profile correctly. This result is similar to the previous studies that showed a significant effect of education and dental training on the rating of facial attractiveness.\[26,29\]

When it was enquired that which type of facial profile they would likely to have after treatment it was noticed that subjects vary in their opinion. Though most of the subjects in both the groups like to have Class I profile after treatment, but $33.96\%$ of dental students and $57.89\%$ of laypeople like to have straight profile after treatment. These results showed that all the patients have the right to choose what happens to them during the treatment. No longer can the doctor decide, in a paternalistic way, what is best for a patient.\[35\]

Conclusions

1. The most attractive profile perceived by both the groups was Class I, followed by straight profile. Least attractive was Class III profile with protrusive mandible
2. Dental students were more accurate in perception of own profile
3. The expected profile of patients after orthodontic treatment is not always Class I. Hence, they should be involved in treatment planning.

References

3. Giddon DB. Orthodontic applications of psychological and perceptual studies of facial esthetics. Semin Orthod

Graph 4: Subjects want to undergo orthodontic treatment in dental student and laypeople group (results in %)

Graph 5: Expected facial profile after orthodontic treatment suggested by dental students and laypeople (results in %)
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