Comparison of esthetics perception and satisfaction of facial profile among male adolescents and adults with different profiles

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ABSTRACT

Objective: To evaluate esthetics perception and satisfaction of the facial profile among Iranian male adolescents and adults.

Materials and Methods: In this cross-sectional study, male subjects referred to Orthodontic Department of Mashhad Dental School were enrolled (n = 84) and were divided into two groups: Adolescents (n = 39), and adults (n = 45). They were also assigned to straight, convex, or concave profile groups based on the facial profile angle (G-Sn-Pog'). An ideal silhouette of the lower facial profile was designed in Adobe® Photoshop® CS2 software (Kansas, USA). Then, eight other silhouettes representing different relations of the maxilla and mandible were constructed. Patients were asked to use numbers 1–10 to rank the facial profiles in the order of the attractiveness, and choose a silhouette that best closely resembled their own profile. Moreover, using a questionnaire patients were asked to rank their satisfaction with their profile, and asked to assign a number (1–5) to each question as follows; one represented the least satisfaction, while five reflected the highest satisfaction.

Results: Adult and adolescent subjects with straight (adults: 12.0 ± 1.9, adolescents: 12.8 ± 1.05) and concave (adults: 10.0 ± 2.14, adolescents: 10.0 ± 2.08) profile showed the highest and the least satisfaction with their own profile, respectively. Both adult and adolescent group selected "retrognathic maxilla, prognathic mandible" as the least attractive profile. Overall, "straight" and "bimaxillary dentoalveolar retrusion" were chosen as the most attractive silhouettes in adolescent and adults, respectively. In comparison to a professional opinion (clinician ranking), 42.9% of adolescents and 22% of adults were able to correctly diagnose their own profiles type.

Conclusion: Most of the male adolescents and especially adults diagnosis of their own profile differed with a professional assessment.

Key words: Adolescent-facial profile, adult, facial esthetics, male, perception, satisfaction

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INTRODUCTION

One of the most important goals of orthodontic treatment is to improve facial esthetics.[1-4] Harmonious relationship of facial structures result in favorable profile esthetics.[5]

Considering profile esthetics is important during orthodontic treatment planning, which will ultimately affect patients' satisfaction of treatment results.[6] The desire to improve facial

esthetics is one of the main reasons people seek treatment by an orthodontist or maxillofacial/plastic surgeon.[5] Previous reports have shown that facial attractiveness affects social communication.[7] Attractive individuals are judged more favorably and treated more positively than unattractive peers.[7,8] The perception of dentofacial esthetics is subjective and is affected by culture and ethnicity.[9,10]

Adolescents and young adults are major part of orthodontic patients with typical age characteristics for their psychological behavior.[11] Some studies have reported that psychological factors have certain impacts on the perception of dentofacial esthetics.[11-13] Self-perception of facial esthetics is the main reason for adolescents and young adults to undergo orthodontic treatment. Despite this, a few studies have investigated self-perception of facial profile among these patients.[11]

Sometimes, patients are convinced to undergo orthodontic treatment based on orthodontic' judgment of their clinician. However, patients' perception of an attractive profile may differ from that of the clinician.[11] The aim of this study was to evaluate self-perception and satisfaction of the facial profile among male adolescents and adults.

MATERIALS AND METHODS

This study was approved by Regional Ethical Committee. Overall, 84 male patients referred to the Orthodontic Department of Mashhad Dental School participated in this study. The patients were divided into two groups: 39 adolescents (13–18 years old) and 45 adults (above 18 years old). Patients with severe crowding and history of orthognathic surgery, congenital anomalies, physical and emotional abnormalities, psychological disorders, and trauma were excluded from the study.

Professional Assessment of Facial Profile
Patients were assigned to three groups: Straight, convex, or concave profile based on the angle of convexity of their facial profile (G-Sn-Pog') according to the Jacobson's soft tissue analysis.[12,14,15] The Angle of convexity of 8–16° indicates a straight profile while an increased or decreased angle is an indication for convex or concave profile, respectively [Figure 1]. To determine the position of the maxillary or mandibular soft tissue, a constructed horizontal plane (CHP) was drawn through "nasion" at an angle of 7° to SN line. A line perpendicular to CHP was dropped from glabella (G). The distance of the subnasal (Sn) and Pog' from this vertical line determined the position of maxilla and mandible, respectively. The average distance of Sn from this vertical line should be 6 ± 3 mm and 0 ± 4 mm for Pog'.

A line was drawn from Sn to Pog' to evaluate maxillary and mandibular dentoalveolar position. For facial balance, the most prominent point of the upper lip (Ls) should be 2–4 mm anterior to this line. Likewise, the most prominent point of the lower lip (Li) should be 1–3 mm anterior to the line.[12]

Patient's Assessment of Their Facial Profile
After signing a consent form, a questionnaire was filled by patients to assess their satisfaction with their own profile. Five orthodontists confirmed the validity of the questionnaire. The reliability of the questionnaire was also confirmed by cronbach's alpha coefficient (α = 0.85). The questionnaire contained five questions, and the patients were asked to assign a number of 1–5 to each question; one represented the least satisfaction while five reflected the highest satisfaction with the profile. Individuals were given a maximum of 10 min to complete the questionnaire.

Assessment of Attractiveness of Maxilla-Mandibular Relationship
One ideal silhouette of the lower facial profile based on Jacobson's soft tissue analysis,[12] was designed by Adobe® Photoshop® CS2 software (Kansas, USA). Then, the position of the maxillary, and mandibular soft tissue, and also upper and lower lip was changed in ± 2 mm increments by Photoshop and eight silhouettes representing different relations of maxilla and mandible were constructed [Figure 2]. The patients were then asked to assign a number of 1–10 to rank the profiles in the order of their attractiveness (1 = the least attractive and 10 = the most attractive), and to choose a silhouette that best closely resembled their own profile. Cephalometric tracings were evaluated independently by two orthodontists to determine the accuracy of the subjects in describing their own profile based on the silhouettes.

The dimensions of all silhouettes were similar (21 cm × 29.7 cm) to minimize the risk of bias.

Statistical Analysis
The ANOVA was used to compare the satisfaction of profile among the three groups. The independent *t*-test was also used
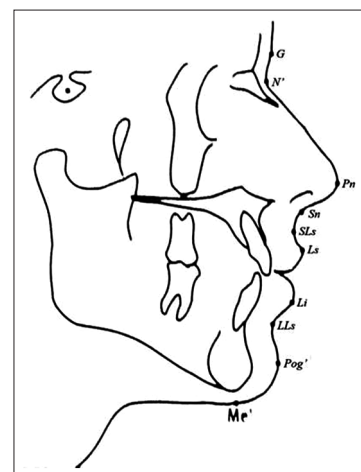

Figure 1: G-Sn-Pog' angle

to compare scores of satisfaction with profile in the adult and adolescent groups ($\alpha = 0.05$)

RESULTS

Satisfaction of the Patients with Their Facial Profile

In adolescents and adults, patients with straight and concave profile showed the greatest and the least satisfaction with their own profile, respectively [Table 1]. The ANOVA test showed a significant difference in satisfaction of patients' own profile among adolescents with different types of profiles ($P = 0.004$, $F = 6.4$). The *post hoc* Tukey test showed that adolescents with straight profile were significantly more satisfied with their profile compared to patients with convex ($P = 0.036$) and concave profiles ($P = 0.001$). The satisfaction with ones' own profile in adolescents with convex profile was also significantly greater than patients with the concave profile ($P = 0.045$).

The ANOVA test did not show a significant difference in satisfaction of own profile among adults with different types of profiles ($P = 0.062$, $F = 2.8$). The independent *t*-test found no significant difference in ranking of facial profile between adults and adolescents with different types of profiles regarding satisfaction of their own profiles [Table 2].

Esthetic Perception of Profiles

Both adults and adolescents selected "retrognathic maxilla and prognathic mandible" as the least attractive profile. Straight and bimaxillary dentoalveolar retrusion were chosen as the most attractive silhouettes in adolescents and adults, respectively [Table 3].

Esthetic perception of the profile was not significantly different among the adolescent with three different types of profile ($P = 0.24$, $F = 1.4$). However, adults with different profiles chose different silhouettes as the most attractive ones ($P = 0.04$, $F = 3.3$). The *post hoc* test showed that there was a statistically significant difference between straight and convex profile adults ($P = 0.04$), and also between convex and concave profile groups ($P = 0.03$). The independent *t*-test showed no significant difference between adults and adolescents with different type of profiles in selecting the most attractive silhouettes ($P > 0.05$).

Diagnosis of the Patients Own Profile Type, Comparison Between the Professional and Patient Assessment

Only 42.9% of adolescents and 22% of adults were able to correctly diagnose the silhouette that best closely resembled their own profile [Table 4]. Adolescents with concave and straight profiles had the greatest and the least percentage of correct diagnosis of their own profile, respectively. However, the difference was not statistically significant ($P = 0.63$). In contrast, adults with straight profiles were more accurate in diagnosing their own profile, while adults with concave profile had the least percentage of correct diagnosis.
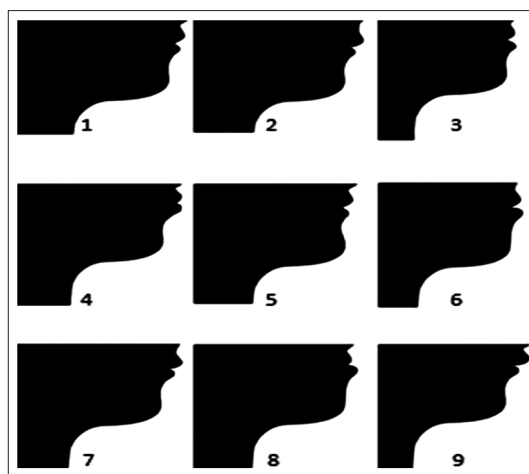

Figure 2: (1) Ideal profile, (2) prognathic maxilla, (3) retrusive maxilla, (4) bidentoalveolar protrusion, (5) bidentoalveolar retrusion, (6) prognathic mandible, (7) retrognathic mandible, (8) retrognathic maxilla, prognathic mandible, (and 9) prognathic maxilla, retrognathic mandible

Table 1: The score of patients' satisfaction with their own profile classified based on facial angle into convex, concave, and straight

Profile convexity	Adolescents		Adults	
	n	Mean±SD	*n*	Mean±SD
Straight	9	12.89±1.05	9	12.00±1.93
Convex	19	11.47±1.61	21	11.38±1.80
Concave	7	10.00±2.08	11	10.00±2.14
	P=0.004, F=6.4*		P=0.062, F=2.8*	

*ANOVA test. SD – Standard deviation

Table 2: Comparison of satisfaction of profile in adolescents and adults

Group	Mean±SD		
	Straight	Convex	Concave
Adolescent	12.89±1.05	11.47±1.61	10.00±2.08
Adult	12.00±1.93	11.38±1.80	10.00±2.14
P*	0.24	0.87	1.00

*Independent *t*-test. SD – Standard deviation

Table 3: Profile attractiveness based on adolescents' opinion (scored 1-10)

Silhouettes	Mean±SD	
	Adolescent	Adult
Straight profile	7.28±2.08	6.49±2.12
Bialveolar retrusion	6.95±2.15	6.33±2.14
Prognathic maxilla	5.97±2.47	5.89±2.19
Retrognathic maxilla	5.41±2.19	4.96±2.15
Bialveolar protrusion	5.13±2.68	4.18±2.23
Prognathic mandible	4.90±2.22	4.09±2.14
Retrognathic mandible	3.77±2.02	3.73±2.39
Prognathic maxilla, retrognathic mandible	3.13±2.34	3.60±2.20
Retrognathic maxilla, prognathic mandible	2.49±1.93	2.31±1.59

SD – Standard deviation

The Chi-square test showed that adolescents were more accurate in selecting their own profile in comparison to adult

Table 4: Distribution of patients according to ability of diagnosis a silhouette that closely resembled their profile

Convexity profile	Correct diagnosis *n* (%)		Incorrect diagnosis *n* (%)		Total *n* (%)	
	Adolescents	**Adult**	**Adolescents**	**Adult**	**Adolescents**	**Adult**
Straight	3 (33.3)	4 (44.4)	6 (66.7)	5 (55.6)	9 (100)	9 (100)
Convex	8 (42.1)	4 (19)	11 (57.9)	17 (81)	19 (100)	21 (100)
Concave	4 (57.1)	1 (9.1)	3 (42.9)	10 (90.9)	7 (100)	11 (100)

patients ($P = 0.044$, $D_f = 2$). The correct selection among patients with straight and convex profile was not significantly different between adult and adolescent groups ($P = 0.17$). However, adolescents with concave profile selected their own profile more accurately than adults with similar profile ($P = 0.04$).

DISCUSSION

Esthetic concern is a main motivational factor for patients seeking orthodontic treatment. Recent research has shown that attractive people are regarded as to be more successful and are treated more positively.[16,17] Different physical, psychological and social factors affect patients' esthetic perception. For example, female Asians prefer retrusive jaws.[16]

In the present study, esthetic perception and satisfaction of profile have been evaluated among Iranian male adolescents and adults. Although patients esthetic perception have been studied in regard to sex, the level of education and patients cultures, the impact of age has been neglected in these studies. In this study, patients with straight and concave profile showed the greatest and the least satisfaction with their own profile. In the study of Espeland and Stenvik[14,18] patients with ideal occlusion had the greatest satisfaction with their own profile. Tessarollo *et al*.[15,19] showed that the severity of malocclusion affected patients' satisfaction of their own profile.

In our study, a significant difference in satisfaction of own profile was found among adolescents with different facial convexities. This could be as a result of characteristic features and emotions of the adolescent period that affect patient satisfaction. O'Brien *et al*.[20] showed that the presence of malocclusion in adolescents reduced their satisfaction with their profile. Stenvik *et al*.[21] reported that patients' attention toward their facial appearance decreases with increasing age. These findings may explain lack of significant difference in satisfaction of profile among adults with different types of profile.

In this study, both adults and adolescents selected "retrognathic maxilla, prognathic mandible" as the least attractive profile. "Straight" and "Bimaxillary dentoalveolar retrusion" were chosen as the most attractive profile in adolescents and adults, respectively. Similarly, in the study of Yin *et al*.[9,12] which was conducted on 16–24-year-old males and females, the straight profile was chosen as the most attractive one. Cala *et al*.[22] also showed that adolescents preferred straight profile which is in agreement with our study. In their study, patients selected "prognathic maxilla, retrognathic mandible"

as the least attractive profile which is not in line with our results. This could be due to different culture background and ethnicities on esthetic perception. Review of previous literature shows that patients are increasingly aware of their concave profiles (Class III) and seek treatments such orthognathic surgery to normalize it.[23,24]

Zulfiqar *et al*.[25] showed that straight and "retrognathic mandible" silhouettes were the most and the least attractive profile among patients, respectively. In our study, adults with straight profile selected prognathic maxilla as the most attractive silhouette. This finding is in agreement with the study of Khosravanifard *et al*.[26] which concluded that prognathic maxilla in adult males was more preferable.

In our study, adult males with concave profile selected the "dentoalveolar retrusion" as the most attractive silhouettes. Soh *et al*.[27] also found that bialveolar retrusive profile was more attractive among patients. This finding was in agreement with the result of our study.

We found a significant difference in esthetic perception of adults with different profiles. However, this difference was not significant between the adolescents. Enhancement of esthetic perception as the patient gets older may be a contributory factor for this difference. Furthermore, enhancement of esthetic perception with increasing age has been reported by Tole *et al*.[28]

In this study, only 24 patients (31.6%) were able to correctly diagnose their own profile (15 adolescents and 9 adults). These results suggest that the patients' perception of profile was not accurate. This result is expected because patients get most of the information about their appearance by looking at the mirror and the profile view is usually considered as less important.[29] Adolescents with concave and straight profiles had the greatest and the least correct selection of their own profile, respectively. Again, this signifies that adolescents with concave and straight profiles are aware of their facial profile type. Adults with concave profile had the least correct selection. In the study of Yin *et al*.[9,12] patients with straight profile had more success in diagnosing their own profile correctly. Bullen *et al*.[30] reported that the adolescents selected their own profile more accurately than adults which were in agreement with the result of our study.

In this study, silhouettes were used to assess esthetic perception. This would omit the impact of sex, hair style, and skin color on patient's esthetic perception.

Considering the above-mentioned results, it is critical that orthodontists listen to the esthetic preferences of the patients, and their self-perception, and also to consider the differences in esthetics perception of adolescent patients with their parents at the time of treatment plan.

CONCLUSION

Most of the male adolescents and especially adults have an incorrect perception of their profile. Furthermore, it is possible that the ideal profile differ in adolescents and adults. In addition, it is vital that orthodontists be aware of their patients' satisfaction of their profile considering their own profile esthetics before treatment.

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Conflicts of Interest

There are no conflicts of interest.

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