

Correlation of lip profile preferences in Pakistani population; and its comparison with orthodontic norms

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Abstract

Objective: To determine the most desired lip profile and compare the subjective sense of aesthetics among orthodontists, general dentists and the general population.

Method: The cross-sectional study was conducted at the Orthodontic Department of the Armed Forces Institute of Dentistry, Rawalpindi, Pakistan, from January 1 to February 25, 2020, and comprised different silhouettes for each gender with increasing lip procumbence from -6mm to +6mm with respect to Rickett's E-line which were created using Photoshop CS 8.0 after cephalometric analysis of 20 cephalograms. The sample comprised an equal number of orthodontists in group A, general dentists in group B and orthodontic treatment-seekers in group C with equal representation of the two genders. Data was analysed using SPSS 24.

Results: Of the 180 subjects, there were 60(33.3%) in each of the three groups, with 30(50%) males and as many females in all the groups. All the three groups preferred the average lip profile for males ($p=0.018$) and 2mm procumbent lips for females ($p=0.008$). There was significant difference of opinion between groups A and C ($p=0.034$) and between groups B and C ($p=0.022$).

Conclusion: There was found to be a marked difference of opinion among the orthodontists, the general dentists and the orthodontic treatment-seekers regarding the desired lip profile.

Keywords: Aesthetics, Pakistani population, Cephalometrics, Lip profile. (JPMA 72: 440; 2022)

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Introduction

In the past, orthodontic treatment was solely concerned with the correction of malaligned teeth, with less focus on the soft tissue profile, but now the soft tissue paradigm has taken preference over the hard tissue and other dental parameters. This is the prime reason of adapting the treatment plan according to the desired soft tissue profile goals.¹ Although many aesthetic parameters have been quantified in orthodontic literature, aesthetics is a subjective phenomenon, and the perception of beauty is influenced by gender, socio-economic status (SES), literacy, ethnicity etc.² Since every population has its own norms and views, evaluation of facial aesthetics is strongly recommended in every community as only the inclining or angulating the teeth as per average norms of orthodontics may not ensure an aesthetic and pleasing profile for all. Specifically, the importance of lip profile is to be assessed and correlated with the opinion of major stakeholders in the treatment. The lip posture has been referred to as a crucial element in defining the overall facial aesthetics, function and post-treatment stability.^{3,4}

It is also documented in literature that the desirability of soft tissue profile depends on race and ethnic preferences

too.⁵ Evaluation of balanced and socially aesthetic profiles have been conducted in various populations.⁶ A study done on Persian population stated that laypersons' perception of aesthetics was different from that of clinicians.⁷ Pakistani studies have mostly focussed on lip and skeletal morphology.⁸

In order to avoid subjective considerations, silhouettes are chosen for rating the profile rather than facial photos. Rickett's E-line is considered the reference line to define the procumbence and recumbence of lips.⁹ A study done in Lahore reported that laypersons ranked retrusive profiles more attractive than protrusive profiles.¹⁰ The current study was planned to evaluate the most desired lip profile in Pakistani population, and to appraise its consistency with Rickett's norms. It also aimed at establishing a relationship with the difference of opinion between orthodontists, general dentists and the general population.

Materials and Methods

The cross-sectional study was conducted at the Orthodontic Department of the Armed Forces Institute of Dentistry (AFID), Rawalpindi, Pakistan, from January 1 to February 25, 2020. After approval from the institutional ethics review committee, the sample size was calculated using OpenEpi calculator¹⁴ at confidence level 95% and bound of error 5% and taking relevant references from literature.¹¹ The sample was raised using stratified cluster

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sampling technique and comprised an equal number of orthodontists in group A, general dentists in group B and orthodontic treatment-seeking patients in group C with equal representation of the two genders. Those included had a normal A point-nasion-B point (ANB) angle 2° and 4° , normal inclinations of upper and lower incisors, as evident by an upper incisor to palatal plane angle of $108^{\circ} \pm 4$, and lower incisor to mandibular plane angle of $94^{\circ} \pm 4$, and normodivergent face with maxillomandibular plane angle of $25^{\circ} \pm 4$. The subjects had normal overjet and overbite, did not have any history of orthodontic treatment, had no retained deciduous teeth, and had all permanent teeth except the third molars. The rest were excluded.

Initially, 40 cephalometric radiographs of 20 male and 20 female young adults aged 21-25 years were traced and an average profile was constructed. All cephalometric radiographs were taken from Epson perfection 4990 photo scanner (Seiko Epson Corporation, Nagano, Japan) with teeth in maximum intercuspation and in natural head position with Frankfort horizontal plane parallel to the floor.

All cephalograms were digitally traced by an operator using Dolphin Imaging version 10 (Dolphin Imaging, Chatsworth, California, United States) and cephalometric analysis was performed using the same software. An average profile was constructed using the cephalometric analysis for both genders. Photoshop CS 8.0 (Adobe Systems, San Jose, California, US) was then used to increase and decrease the lip procumbence from E-line, with 2mm change in successive images and creating silhouettes (Table). Lips coincident with Rickett's norms (upper lip-2mm, lower lip-1mm) were regarded as average lip profile in the study as E-line (nasal tip-soft tissue pogonion) is most frequently used by clinicians and orthodontists in aesthetic assessment of patients.

A set of seven silhouettes were created for each gender with lip recumbence initiating at -6mm and moving to +6mm with respect to Rickett's E-line (Figure-1) All images were randomly arranged and coded in order to remove the biasness depicted by the ease of visual increment in fullness of lips.

Table: Order of lip procumbence as depicted in Figure 1.

Profile No.	Definitions with respect to E-line
1	6mm lip retrusion
2	4mm lip retrusion
3	2mm lip retrusion
4	Coincident lips
5	2mm lip protrusion
6	4mm lip protrusion
7	6mm lip protrusion

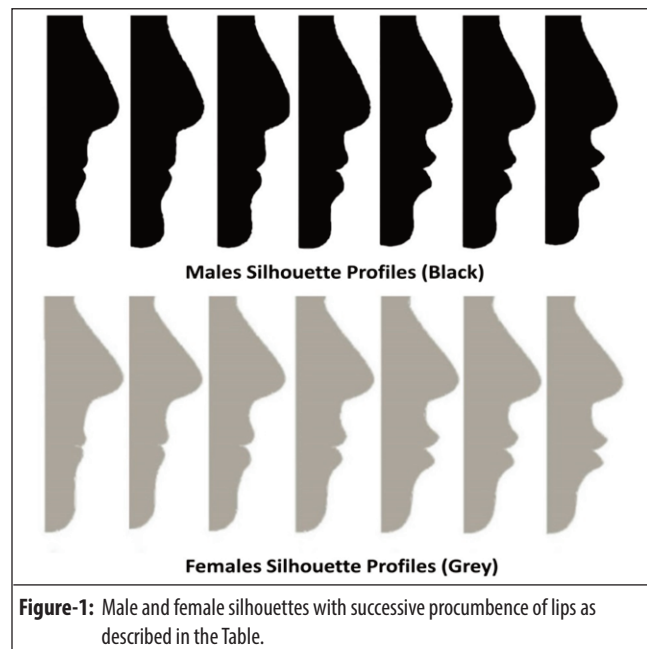


Figure-1: Male and female silhouettes with successive procumbence of lips as described in the Table.

The subjects were asked to select the most and the least desired lip profile in each gender.

Data was analysed using SPSS 24. Chi-square test was used to analyse the differences among the three groups about their selective preferences in each gender, and intra-class correlation coefficients were used to analyse pairwise comparison. $P < 0.05$ was considered statistically significant.

Results

Of the 180 subjects, there were 60(33.3%) in each of the three groups, with 30(50%) males and as many females in all the groups. All the three groups preferred the average lip profile for males ($p=0.018$) and 2mm procumbent lips for females ($p=0.008$) (Figure-2). There was significant difference of opinion between groups A and C ($p=0.034$) and between groups B and C ($p=0.022$).

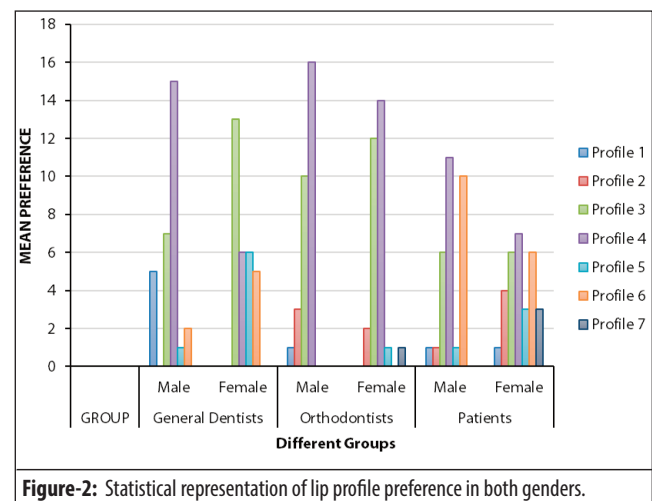


Figure-2: Statistical representation of lip profile preference in both genders.

The results of the least desired profile were non-significant for both males ($p=0.3$) and females ($p=0.7$).

Discussion

Achievement of a good facial balance showing pleasing dental and facial aesthetics is the result of most dominant importance in orthodontic treatment in modern-day dentistry. The indispensability of harmonious facial proportions in orthodontic patients cannot be over-emphasised, but no study was previously done to define an aesthetic lip profile in the Pakistani population. In the absence of such evidence, it is difficult to tailor the orthodontic treatment as per the needs of the population. The current study aimed at quantifying an aesthetic lip profile according to the perception of the three segments whose opinions affect the end-result of orthodontic treatment: orthodontists, general dentists, and orthodontic treatment-seekers.

In a study,¹² 2mm retruded than average lip profile in both genders was rated as the most desired Japanese profile by orthodontists, whereas the current study differed with that opinion, finding the average Rickett's lip profile to be the most desired one for Pakistani males, and the average Rickett's profile with 2mm lip procumbence for Pakistani females.

The current study found that the general population preferred average profile with 4mm protruded lips in males and 6mm procumbent lips were desired in females. The orthodontists' opinion differed considerably, shown by a unanimous likeness of Rickett's average profile for males and in case of females, marked assuage for 2mm recumbent lips and the Rickett's average. This is silent evidence that most of the orthodontist's desirability of aesthetics is based solely on the academic course of study which they have been through over the years. The result depicted a statistically significant difference of opinion between the treatment-seekers when compared to the orthodontists and the dentists.

A similar research done in the United Kingdom laid emphasis on the features deemed unattractive by the general population of England. The facial features included lip and chin prominence that needed surgical intervention once the orthodontic treatment was finished.¹³ The results are in accordance with the current study which found excessively procumbent lips to be the least desired ones. A study done India, in contrast to the findings of current study, suggested that youth and freshness are implied by more convex profiles and fuller lips in females, therefore procumbent lips were preferable in the Indian population.¹⁴ It further stated that procumbent lip profiles were also desired for men, because of the influence of

social media and fashion exposure.¹⁴ However, studies done in Turkey suggested that males with retruded lips and with flatter profiles were preferred.¹⁵

A study¹⁶ inquired African-American males and females about the desired and undesired profiles using silhouettes of African-Americans. Significantly retruded lip profiles were preferred for males than for females. However, in contrast to the present study, the preferred profiles were anterior to the E-line. This possibly might have been because no silhouette used in the other study had the lower lip positioned behind the E-line probably because of generally evident fuller lips of African-American population. Other studies¹⁷⁻¹⁹ also used silhouette profiles with altered lip positions to assess preference of their target populations, from which the desired facial profile for each gender was selected. They figured out gender-specific ideal profiles and documented that significantly more retruded lips were preferred for males than for females. The current study showed that, in comparison of both genders, male lip profile was preferred to be 2mm retruded than that of the females. The chin would appear more prominent as the lips are positioned more posteriorly, giving the desired impression of masculinity.

A study on Caucasian population stated that the general opinion was inclined towards the procumbent lips for males more than the females.²⁰ This result is exactly opposite to the findings of the current study. This comparison provides quantitative proof that different ethnicities have different sense of aesthetics even though there may not be much of a geographical distance.

A study²¹ assessed the profile perception of Chinese and Indian laypersons in China by the manipulation of profile images in anteroposterior dimension by 2 standard deviations (SDs) proposed by accustomed norms of Chinese population. The raters preferred protruded lips for both females and males by 2mm. These results contradict the male profile preference in the current study.

During the course of the current study, it was observed that the orthodontic treatment-seekers and the general dentists potentially observed characteristics that were not quite affected by the cephalometric variables calculated, such as the position of the nasal tip and its balance with the position of the chin and forehead. The two aforementioned groups generally focussed on the soft tissue outline of the images. Studies seeking the association between cephalometric values and perception also showed similar results.^{22,23}

The most important aspect of the current study is its uniqueness in the Pakistani dental literature since, to the

best of our knowledge, it is the first study establishing the opinion of Pakistani population regarding lip profile preference specifically. The small sample size and less heterogeneity of the sample are limitations of the current study.

Further studies are recommended with larger sample size comprising different ethnic groups within the country.

Conclusion

The orthodontists, the general dentists and the orthodontic treatment-seekers, when assessed regarding their lip profile preference, stated desirability of lips coincident with E-line in males, whereas 2mm procumbent to E-line was preferred in females. There was a marked difference of opinion between the orthodontists and the patients on what constitutes an aesthetic lip profile. This is a challenging component of treatment planning since the two stakeholders are not on the same page according to statistical analysis.

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