

Orthodontists' and laypersons' perception of chin attractiveness in relation to lower lip position

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Abstract

Introduction: Interrelationship of facial soft tissue components plays key role in establishing the facial esthetic perception. Chin prominence has relation with the esthetic look of nose and lips. Hence the objective of the present study was to determine the mean attractiveness score of various positions of chin with concomitant changing the positions of lower lip among the Pakistani orthodontists and laypersons.

Material and Methods: This cross sectional survey was conducted at de'Montmorency College of Dentistry, Pakistan. 100 respondents were enrolled. Informed consent and demographic information was taken. A silhouette of an idealized profile image was made. This profile picture was modified to create 6 images each for different degrees of chin prominence and lower lip. The score of attractiveness was distinguished by both orthodontists and laypersons for all images.

Results: The study results showed that in images 1 to 7, where lip and chin moved together in sagittal plane, statistically significant differences were found between the study groups except for image number 5. In images 8 to 14, where only chin moved in sagittal plane, statistically significant difference was found between the study groups except for image 8, 9 and 14.

Conclusions: Laypersons and orthodontists both ranked retrusive profiles more attractive than protrusive profiles. In profiles with protrusive chin, more protrusive lower lip position was preferred, while with a retrusive chin, normal lower lip posture was preferred.

Keywords: Esthetics; perception; protrusion

Introduction

I nterrelationship of facial soft tissue components plays a key role in establishing facial esthetic perception.

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Chin prominence has a relationship with the esthetic look of nose and surgeons often discuss this point with patients of rhinoplasty.¹ In the same way, it is paramount to assess different degrees of lip prominence in relation to facial esthetics.^{2,3} Rickett et al described the E-line drawn from nasal tip to Pogonion and the lower lip is considered attractive if it is in the range of 0 ± 2 mm anterioposteriorly from E-line.⁴

It has been proved that sagittal position of chin and its height plays a role in perceived attractiveness of orthognathic patients.^{2,5} Studies also have been done showing that mandibular position changes significantly influence the esthetic preferences of upper and lower lip in profile.³

Orthodontics and orthognathic surgery are treatment options that can enhance facial esthetics in such orthodontic patients.^{6,7} Previous study done on western population to determine the effect of varying position of Chin with lip and chin without changing the position of lower lip on perceived attractiveness of chin among orthodontist and laypersons shows that lower lip being protrusive and chin being retrusive is considered attractive.

No study has been conducted on Pakistani population ascertaining such a perception and therefore current study was conducted involving orthodontic postgraduate trainees and lay persons to see the effect of changing position of lower lip on the perceived attractiveness of the chin. This study can guide us regarding optimal position of lower lip while planning orthodontic treatment or orthognathic surgery and may provide clinicians with more information assisting in treatment decisions.⁸

Material and Methods

This cross sectional survey was conducted at de'Montmorency College of Dentistry, Pakistan. Estimated Sample size was 100 participants (50 each for orthodontists and laypersons group), with 80% power of test and 5% level of significance with expected mean chin attractiveness score of 6.98 ± 4.56 by orthodontists and 7.12 ± 4.12 by lay persons.

Lay persons were patients coming for routine dental checkup in OPD with minimum level of education being metric or above and had no pervious orthodontic treatment nor knowledge about it. Orthodontists who had completed at least 1 year of training, aged between 18 to 50 years irrespective of gender were included in the study. Mentally disabled people were excluded from the study. Pictures on the A4 photographic paper were used.

To determine the attractiveness, an ideal face silhouette picture (Figure 1) was created with Adobe Photoshop CS3 Software (Adobe

Systems Inc, San Francisco, CA) and was manipulated further to create 14 images with different position of lip and chin (Figure 2). Ideal position of lips to the E-Line ranges from 0 ± 2 mm and these norms were used to construct an ideal silhouette image.^{1-4,9,10} The ideal facial profile was modified in a way that mandibular prominence i.e. chin and lower lip was moved by increment of -4 mm from -12 mm to +12 mm. Images were also created in which only chin (at stable lower lip position) was moved by -4 mm increments from -12 to +12 mm. In this way two sets of 7 images were created. In 1st set of 7 images, lips and chin moved simultaneously and in second set only chin was moved. A total of 14 images were created. Each image was allocated a number in randomized way to reduce bias. Each image was printed on A4 size photographic paper and was presented to participants in random order. Each participant was given a questionnaire to rank each photograph separately in 30 seconds, from most attractive to least attractive i.e. 1 to 14 scale (Figure 3), in which 1 was considered most attractive and 14 as least attractive. The data was analyzed using SPSS 21.0. Quantitative data like age and gender was presented by frequency and percentages. Facial attractiveness was presented by Qualitative data. Data was further stratified for educational status of lay persons, and year of training of residents. Both groups were compared for the mean attractiveness score by using independent sample T-test. P-value ≤ 0.05 was taken as significance.

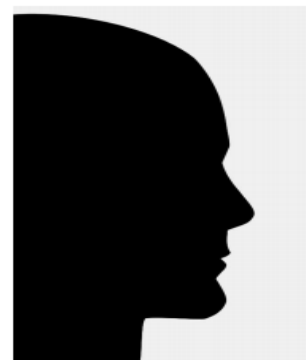


Figure 1: Original idealized image.¹⁹

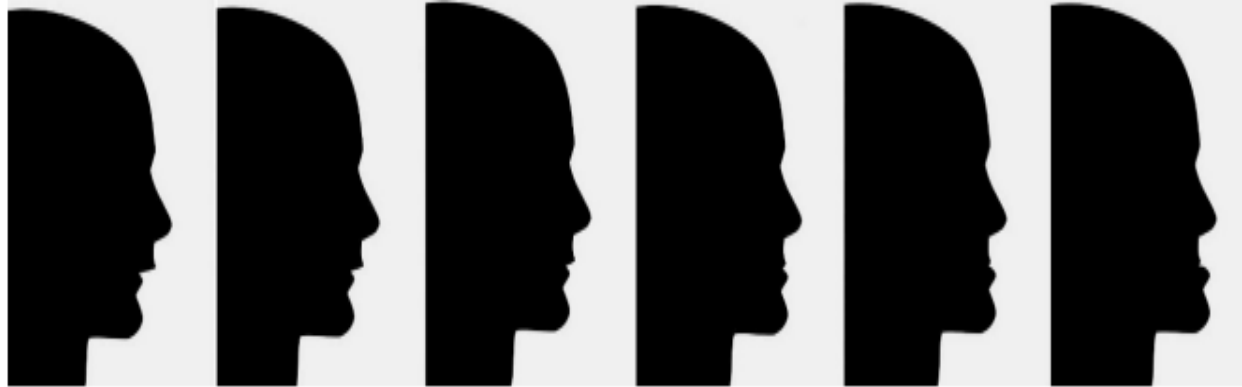
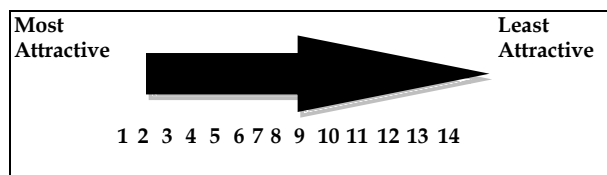
Figure 2: Showing lip and chin manipulation.¹

Figure 3: Attractiveness scoring scale

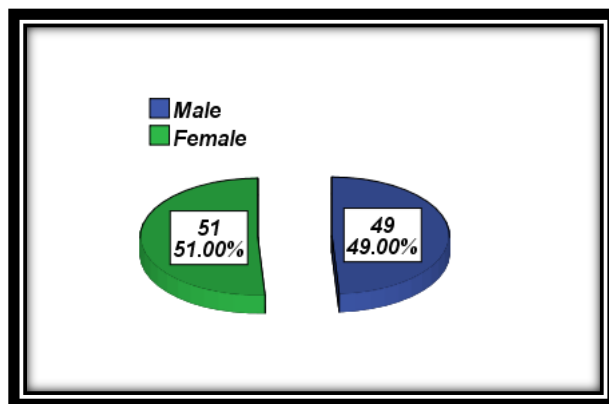


Figure 4: Frequency distribution of gender

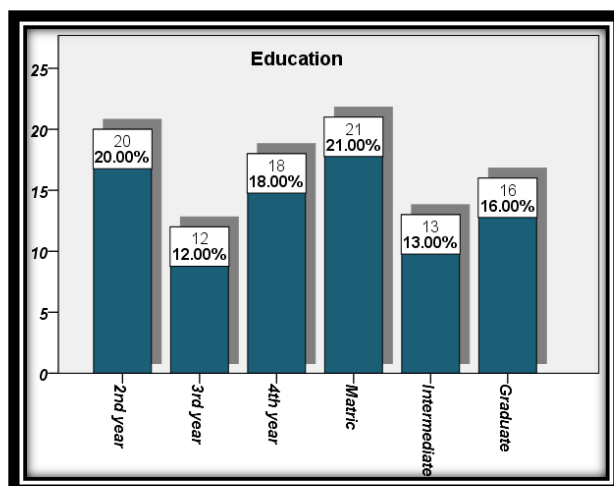


Figure 5: Frequency distribution of gender

Results:

In the present study, a total of 100 respondents were selected. The mean age of layperson group was 23.16 ± 4.57 years and its mean value in orthodontist's group was 29.66 ± 3.76 years (Table I). Male respondents were 49 (49%) in which 25 were from layperson group and 24 were from orthodontist group, similarly the female respondents were 51 (51%) in which 25 were from layperson group and 26 were from doctor group (Figure 4, Table II). Education level of respondents is shown in Figure 5. The study results showed that in images 1 to 7, where lip and chin moved together in sagittal plane, statistically significant differences were found between the study groups except for image number 5 (Table III). In images 8 to 14,

Table I: Comparison of age with study groups

		Study Groups	
		Lay men	Doctor
Age (years)	N	50	50
	Mean	23.16	29.66
	SD	4.57	3.76

Table II: Comparison of gender with study groups

		Study Groups		Total
		Layman	Doctor	
Gender	Male	25	24	49
	Female	25	26	51
Total		50	50	100

where only chin moved in sagittal plane, statistically significant difference was found between the study groups except for image 8, 9 and 14 (Table IV).

Table III Comparison of Lip & Chin Move together in sagittal plane with study groups

Image No.		Study Groups	
		Lay man	Doctor
Image 1	N	50	50
	Mean	11.32	9.94
	SD	1.66	1.50
	P	0.000	
Image 2	N	50	50
	Mean	8.80	8.24
	SD	1.34	1.19
	P	0.029	
Image 3	N	50	50
	Mean	2.34	3.08
	SD	1.29	1.47
	P	0.009	
Image 4	N	50	50
	Mean	2.58	2.22
	SD	0.97	0.84
	P	0.050	
Image 5	N	50	50
	Mean	5.52	5.72
	SD	0.78	1.25
	P	0.340	
Image 6	N	50	50
	Mean	9.54	10.66
	SD	1.80	2.11
	P	0.005	
Image 7	N	50	50
	Mean	12.66	13.34
	SD	1.44	0.96
	P	0.006	

Table IV : Comparison of only Chin Move in sagittal plane with study groups

Image No.		Study Groups	
		Lay man	Doctor
Image 8	N	50	50
	Mean	10.96	10.28
	SD	2.07	1.92
	P	0.091	
Image 9	N	50	50
	Mean	7.00	7.48
	SD	1.26	1.49
	P	0.085	
Image 10	N	50	50
	Mean	2.58	3.28
	SD	1.46	1.25
	P	0.011	
Image 11	N	50	50
	Mean	2.68	2.00
	SD	1.06	1.01
	P	0.001	
Image 12	N	50	50
	Mean	6.08	5.36
	SD	1.31	1.61
	P	0.016	
Image 13	N	50	50
	Mean	9.96	10.56
	SD	1.83	1.68
	P	0.091	
Image 14	N	50	50
	Mean	12.98	12.84
	SD	1.12	1.15
	P	0.538	

Discussion:

This cross-sectional survey was carried out to determine the mean attractiveness score of chin with varying position of chin with and

without changing the position of lower lip among the orthodontist and laypersons. Recent studies show that the face plays a key role in the human social interactions.^{11,12} Few studies have investigated the relationship between the position of the chin and lips on facial attractiveness as assessed by both orthodontists and lay people. The designs of these studies have consisted of raters comparing and ranking facial profiles and manipulating the position of the lips to determine the most attractive arrangements.^{3,13}

Findings of current study showed that for half of images, doctors showed more concern regarding attractiveness instead of laymen. While for half of images, layman showed more concern regarding attractiveness instead of doctors. Laypersons and doctors both felt that retrusive profiles are more attractive than protrusive profiles. Laypersons felt that in chin protrusion if lip is moved along with chin it will improve the profile while according to doctors group it would worsen the profile. In retrusive profiles silhouettes, doctors felt that if lip was also retruded along with chin it would improve the profile while according to laypersons, moving lower lip along with the chin in a retruded position, profile worsens. Laypersons also concluded that profile is more attractive if lower lip is just behind the upper lip while doctors felt that upper and lower lip should be in line. Thus it was found that moving lower lip along with chin significantly affects mean ranking score for each image.

Amjad Al Taki and Amina Guidoum¹⁴ concluded in their study that dentists, undergraduate dental students and laypersons had a similar facial perception. Laypersons were more tolerant to facial profiles with bi-maxillary retrusion. The dentists' esthetic perception was high only for facial profiles of female gender while most of the non-dentists' were unable to determine their decisions on assessment of profile.

Rickett et al described the E-line which is

drawn from tip of the nose to the chin to describe the position of the lips showing importance of the position of lower lip in relation to the nose and chin i.e. the lower lip is attractive if it is in the range of 0 ± 2 mm anterioposteriorly from E-line.⁵ Research has shown that laypersons range of acceptable facial profiles is wider than that of the professional groups.^{15,16}

Scott et al studied the impact of lips and malocclusion on smile esthetics by surveying lay people and dental professionals. Thick and medium upper and lower vermilions were rated as significantly more attractive than thin vermilions for both lips.¹⁷ Patients and clinicians were found to be more critical than laypeople but there were no significant differences found between clinicians and patients.⁵ A study by Sheriann K. Shimogaki et al¹⁸ concluded that lay people and orthodontists both males and females, did not differ in their assessment of attractiveness in straight, retrognathic and prognathic profiles. Lay people and orthodontists were reliable in their assessments of facial profile attractiveness.

The limitation of this study was a small sample size. Therefore, we suggest conducting another multi-centric study with larger group size.

Conclusions

Doctors showed more concern regarding attractiveness instead of laypersons for half of the images whereas lay people showed more concern regarding attractiveness instead of doctors in the other half of the images. Laypersons and doctors both feel that retrusive profiles are more attractive than protrusive profiles. Lastly, laypersons perceive that with chin protrusion, if the lip is moved along with the chin, it can improve the profile whereas according to the doctors group it was the other way around. It is concluded that moving lower lip along with chin significantly affect mean ranking score for each image.

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