

Esthetic perceptions of dentists and laypersons about different combinations of facial contours and upper incisor shape: a comparative study

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ABSTRACT

Introduction: The shape and color of the permanent incisor increase the aesthetics of one's smile. Patients and Dentists prefer a straight incisal plane uniform teeth with an equilibrated smiles. Although there are discrepancies between the preferences of dental professionals and lay persons.

Objective: To select most esthetic photograph among the square, ovoid, tapered facial contour with 3 types of tooth shapes (square, ovoid and tapered), compare the data achieved from both the groups (dentists and laypersons), to recommend the outcome of the study to the dentists.

Materials & Methods: A descriptive cross-sectional study was carried out in Rehman College of Dentistry, Peshawar, Khyber Pakhtunkhwa, from December 2021 to December 2022 on 270 dentists and laypersons (135 each) using a survey instrument that included 18 photographs of male and female faces. Up to 2 mm of gingiva was shown, with 3 types of shapes of teeth (tapered, ovoid and square) for each type of facial contour. Each subject had to observe each set of facial contour with three different shaped incisors and had to choose the most esthetic incisor from each set in 30 seconds. Data were analyzed by SPSS 22, with $p \leq 0.05$ indicating significance.

Results: Significant differences were noted in the preferences of dentists and laypersons for female facial contours and shape of teeth (all $p < 0.05$). For the male facial contours, most, but not all, of the differences were statistically significant. In general, dentists preferred ovoid shape of incisors for the square shaped faces of both genders; dentists preferred ovoid shape incisors for 4 out of 6 sets of photographs, whereas laypersons preferred square or tapered shapes of incisors.

Conclusion: There was no general consensus in esthetic perception towards the frontal facial contour and maxillary incisor shape. Dentists tend to prefer ovoid shape tooth for almost all frontal facial outline.

Keywords: Dentists; Orthodontists; Esthetics; Incisor.

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INTRODUCTION

A charming smile increases the acceptability of an individual to the society and helps to improve the interpersonal relationships.¹ The shape and color of the permanent incisor increase the aesthetics of one's smile.²

Patients and Dentists prefer a straight incisal plane uniform teeth with an equilibrated smile.³

This equilibrium can be achieved by having knowledge of certain factors like color, size, shape, proportion, texture, and symmetry. Knowledge about these details can please the needs of patients.⁴

Upper lateral incisors are the most common teeth to be missing.⁵ The absence of lateral incisors can affect one's personality. There are different treatment options such as by placing a prosthesis or closure of space by forcing canine into maxillary lateral incisor's place orthodontically.⁶

Regarding the shape of the teeth, Williams in 1914 suggested a relationship between the shape of the maxillary permanent incisors and the inverted face shape, which is known as "law of harmony" so the upper central contours were classified by Williams into 3 classes: square, oval, and triangular.⁷ On the other hand, several studies have reported that the level and type of education can influence people's esthetic perception.⁸

Although many studies have considered different aspects of esthetics regarding smile, some of the studies have included lay persons' preferences of smile esthetics for anterior tooth shape.

Anderson et al., evaluated the esthetic perception of tooth shapes when smiling and found discrepancies between the preferences of dental professionals and lay persons.⁹ Brisman stated that the patients' and dentists' opinions differ when evaluating images and photographs of upper central incisor variations in shape, symmetry and proportion.¹⁰ Study carried out by Waqas M, et al, showed that there are differences in laypersons' and orthodontists perception of smile.¹¹

The study was conducted to differentiate between the esthetic perception of dentists and laypersons, so that the dentists can give priority to needs of patient while performing any procedure.

Subjects were to select among the square, ovoid, and tapered facial contours with 3 types of tooth shapes (square, ovoid, and tapered), to allow evaluation and comparison of the differences in esthetic perception between dentists and laypersons, and to recommend the outcome of the study to the dentists.

MATERIALS & METHODS

A descriptive cross-sectional study was carried out in Rehman College of Dentistry, Peshawar, Khyber Pakhtunkhwa from December 2021 to December 2022. Sample size was 270, divided into 2 equal groups, 135 dentists and 135 laypersons using OpenEpi software of sample size determination having 90% confidence level. Dentists and laypersons above the age of 18 were included in the study. After obtaining ethical approval from the Research Ethics Committee of Rehman College of Dentistry, subjects fulfilling the inclusion criteria were considered in the study. The survey instrument was taken from a previously

published article.¹² It included 18 photographs of black and white male and female having square, ovoid and tapered facial contour with different combinations of incisal shape i.e. square, ovoid and tapered incisal contour (Figures 1-6). Photographs of the subjects included were healthy without any severe dental or facial alterations. Up to 2 mm of gingiva was shown, 3 types of shapes of tooth (tapered, ovoid and square) for each type of facial contour.

Each subject had to observe each set of facial contour with three different shaped incisors and had to choose the most esthetic incisor from each set in 30 seconds. Dentists and laypersons had to select from that survey instrument.

SPSS version 22 software was used to analyze the data. Chi square test was applied to compare the data. A p value ≤ 0.05 was considered statistically significant.



Figure 1: Square Female (A)



Figure 2: Square Male (B)



Figure 3: Tapered Female (C)



Figure 4: Tapered Male (D)



Figure 5: Ovoid Female (E)



Figure 6: Ovoid Male (F)

RESULTS

The 135 dentists included were in the 22-41 years group with a mean age of 28.7 ± 5.25 years; there were 65 (48.15%) males and 70 (51.85%) females among the dentists. The laypersons were in the age group of 18-50 years with a mean age of 30.2 ± 4.0 years; there were 74 (54.8%) males and 61 (45.2%) females among the laypersons (Table 1).

Table 1: Age and Gender distribution of subjects (n=270).

#	Variables	Dentists	Laypersons
1.	Ages (Years)		
	Range	22-41	18-50
	Mean	28.7 ± 5.25	30.2 ± 4.0
2.	Gender		
	Male	65 (48.15%)	74 (54.8%)
	Female	70 (51.85%)	61 (45.2%)

Table 2 provides the data for the preference of Dentists and Laypersons for different esthetic female facial contours. Laypersons preferred the tapered tooth shape in the square female facial contour (64/135, 47.4%) and dentists preferred the ovoid tooth shape in the square female facial contour (85/135, 63.0%); the difference was statistically significant ($p < 0.001$).

Laypersons preferred the tapered tooth shape in the ovoid female facial contour (60/135, 44.4%), whereas dentists preferred the ovoid tooth shape (64, 47.4%). There was a significant difference between groups ($p = 0.001$).

Laypersons preferred the square tooth shape in the tapered female facial contour (58/135, 42.9%), whereas dentists preferred the ovoid tooth shape (63/135, 46.7%). This difference was statistically significant ($p = 0.03$).

Table 2: Preferences of Dentists and Laypersons for female facial contour and teeth shapes (n=270).

Facial Contours	Shapes of Teeth f (%)			p value
	Square	Ovoid	Tapered	
Square face				
Dentists	30 (22.2)	85 (63.0)	20 (14.8)	<0.001
Laypersons	36 (26.7)	35 (25.9)	64 (47.4)	
Ovoid face				
Dentists	40 (29.6)	64 (47.4)	31 (23.0)	0.001
Laypersons	33 (24.4)	42 (31.1)	60 (44.4)	
Tapered face				
Dentists	45 (33.3)	63 (46.7)	27 (20.0)	0.032
Laypersons	58 (42.9)	42 (31.1)	35 (25.9)	

Table 3 provides the data for the preference of subjects for male facial contours and teeth shapes. Laypersons preferred the square tooth shape in square male facial contour (58/135, 42.9%) while dentists favored the ovoid tooth shape (60/135, 44.4%); this difference was statistically significant (p=0.001).

For the ovoid male facial contour, laypersons preferred the tapered tooth shape (54/135, 40.0%), dentists preferred the square tooth shape (69, 51.1%). The difference was statistically significant between these groups (p=0.001).

Laypersons preferred the tapered tooth shape in the tapered male facial contour (54/135, 40.0%) whereas dentists also preferred the tapered tooth shape (52/135, 38.5%). The preferences indicated a non-significant difference (p=0.71).

Table 3: Preferences of Dentists and Laypersons for male facial contour and teeth shapes (n=270).

Facial Contours	Shapes of Teeth f (%)			p value
	Square	Ovoid	Tapered	
Square face				
Dentists	31 (22.9)	60 (44.4)	44 (32.6)	0.001
Laypersons	58 (42.9)	36 (26.7)	41 (30.4)	
Ovoid face				
Dentists	69 (51.1)	32 (23.7)	34 (25.2)	0.001
Laypersons	36 (26.7)	45 (33.3)	54 (40.0)	
Tapered face				
Dentists	43 (31.8)	40 (29.6)	52 (38.5)	0.71
Laypersons	37 (27.4)	44 (32.6)	54 (40.0)	

DISCUSSION

The shape, color and location of anterior teeth enhances the esthetics of an individual's smile. In cases which involves the reconstruction of such teeth, parameters are needed to aid in creating a plan of treatment that harmonize with the expectations of both dentists and patients.¹³ To achieve a best possible esthetic

result of any dental treatment of anterior teeth, dentists are supposed to construct appropriate smile design. The position, proportions, form, and the color of the anterior teeth are very important in the dental treatment for the esthetics of a patient. In the present study, esthetic perception between different level of education towards different facial and tooth contours was found. Laypersons and Dentists had significant differences between choices of anterior teeth. Dentists preferred ovoid shape of incisors for the square shape faces of male and female, ovoid shape faces of females and tapered shaped faces of female. So dentists preferred ovoid shape incisors for 4 out of 6 sets of photographs whereas laypersons preferred square or tapered shape incisors. Anderson et al. also proved in his research that dentists have inclination for ovoid shaped incisors laypersons towards square shape incisors.¹⁴ Marco Rosa et al. had also found the difference.¹⁵ It means that there is a difference in the esthetic perception of dentists and laypersons.

The determination of the shape of teeth regarding the temperament was first proposed by White in 1884.¹⁶ The popularity of this theory was lost due to no scientific proof. In 1914. Williams proposed the "law of harmony", which stated that there was a high association between the shape of the maxillary incisors and shape of face.¹⁷ This theory has been rejected as many other studies proved that no such correlation exists. Later Fisher and Frush have presented "Dentogenic theory"¹⁸ which was abandoned due to complex nature of tooth shapes in a dentofacial synchronization. They thought that female nature such as delicacy and smoothness should be expressed in the teeth, that is a rounded borders and oval shape. Likewise, male characteristics should be reflected in the teeth such as vigor and boldness, that is by square forms. But none of these studies classified central incisor shapes by using standardized methods. In the present study it was also elucidated that the shape of incisors were not in correspondence to the shape of face, such as ovoid-ovoid, tapered-tapered or square-square. Only tapered teeth were selected for tapered males by both of the groups.

CONCLUSION

There was no general consensus among dentists and laypersons in esthetic perception towards the frontal facial contour and maxillary incisor shape. Dentists tend to prefer ovoid shape of teeth for almost all frontal facial outline.

LIMITATIONS

Some limitations of this study need to be discussed. Groups should be made of subjects with similar ages in order to decrease influence of this factor on esthetic perception.

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