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Altered Buccal Corridor Effects on Smile Aesthetics among Dental Students and Laypeople

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ABSTRACT

Objective: To assess and compare the perception of Buccal Corridor (BC) spaces on the aesthetics of smile between laypeople and dental students. **Materials and Method:** It was a cross-sectional study conducted at Karachi Medical Dental College. A digital photograph of a girl's posing smile using image editor (Adobe Photoshop version 7), displaying dentition from 1st molar to 1st molar with changed Buccal Corridor (BC), has been created. Buccal Corridor have been digitally modified by 5% rise, assessed with internal commissural width from 0% to 25%. Total seventy-five dental students studying in final year and 75 laypersons of age >19 years of either gender were included in the study. The rating was done using visual analog scale (VAS) to assess the esthetic of each smile. The score for esthetic was classified from 0 to 100, the lowest being 0 and the highest esthetic rating being 100. SPSS version 23 was used to analyze data. **Results:** The medium broad smile (15% BC) was rated highest by the dental students whereas broad smile (5% BC) was rated highest by the laypeople. There was statistically difference was observed between the rating of dental students and laypeople for narrow smile (25% BC), medium smile (15% BC), broad smile (5% BC) and medium-broad smile (10% BC) ($p<0.05$). **Conclusions:** The Buccal Corridor space is seen by laypeople and dental students as an imperative factor in shaping their esthetic assessments. Both the dental students and the dental students favored medium to wider smiles.

INTRODUCTION

The smile of people reflects happiness and joy and it is undeniable how smile can affect people's social life (1, 2). To facial aesthetics the lip and the teeth are considered as important (3). The attraction of smiles has been assessed in contemporary orthodontics. Recently there are two aspects of smile esthetics: smile arch and Buccal Corridor spaces which have captured the interest of dentists. (4-6)
The interaction between the curvature of the incisal margins of the maxillary and canine incisors and the curvature of the lower lip in the posed smile is defined as the smile arc. (7) This arc is preferable if the lower lip curvature is similar to the curvature of the maxillary incisal edge. (8) Meanwhile, the Buccal Corridor (BC) during a smile is the distance between the corner of the mouth and the lateral maxillary teeth that appears as a dark or black area. (9)
Literature has shown that a very large denture gives the individual an unhealthy denture shape. Nowadays though, as more people live longer and maintain their natural teeth, the concept of good smile aesthetics increasing shift. In fact, when full-face color photos were shown to laypeople with five adjustments in the BC, faces with small BC spaces were favored. Thus, laypeople substantially preferred narrow to broader smiles. (3)
Different people have different views and interpretations of the same thing or event. Likewise, there are different views of dental students and laypeople. Laypeople are people who have finished their basic education but have no understanding of the technical aspects of smiling. The goal of this study was to assess and compare the perception of BC spaces on smile aesthetics among dental students and laypeople with the hypothesis that BC spaces influenced smile aesthetics and that perception differed between different groups of evaluators.

MATERIAL AND METHODS

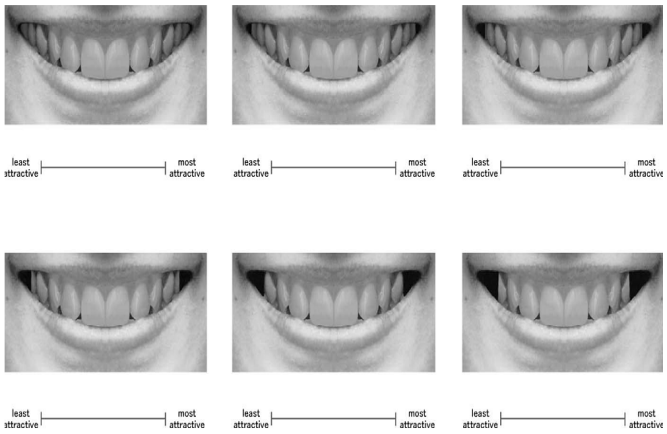
It was a cross-sectional study conducted at Karachi Medical Dental College, Karachi, Pakistan. Total seventy-five dental students studying in final year and 75 laypeople

of age >19 years of either gender were included in the study by using non-probability convenience sampling technique. The ethical approval was sought prior to conduct of study and informed consent was obtained from all the participants before data collection.

Image editor (Adobe Photoshop version 7) was used to convert these pictures to create balanced teeth and lips bilaterally. BC was measured as the gap between the apparent maxillary dentition distance and the inner commissural width separated by the internal commissural width. As the BC would fall, the width of the dental arch increases, this resulted in broad smiles. Hence, six dissimilar ranges of BC were produced and displayed on A-4 size paper. (Figure 1).

Figure 1

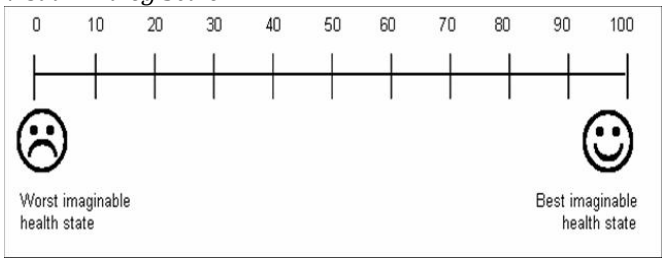
Series of Six Images Illustrating the Range of Buccal Corridor Created: Extra Broad (0% Buccal Corridor) Broad (5% Buccal Corridor), Medium Broad (10% Buccal Corridor) Medium (155 Buccal Corridor), Medium Narrow (20% Buccal Corridor) & Narrow (25% Buccal Corridor)



The dental students and laypeople assessed the esthetic appraisal of each smile through the use of a visual analog scale (VAS). (Fig 2) To evaluate every smile the raters used their own esthetic sense. Esthetic score was classified from zero to 100 mm, the leftmost position meant "extremely unattractive" and "very attractive" the rightmost position, with 0 being the lowest and 100 being the highest esthetic value. The ratings were calculated from the left-most to the rater's level. The researcher used an electronic, digital caliper to calculate the length. All values obtained in mm were reported as scores.

Figure 2

Visual Analog Scale



SPSS version 23 was used to analyze the data. The mean and SD of VAS score were calculated. The mean VAS score was compared between dental students and laypeople using independent t-test. P≤0.05 was taken as statistically significant.

RESULTS

The mean age of the laypeople and dental students was reported as 23.19±4.53 and 21.78±0.72 years respectively. Majority of the participants were females (n=113, 75.3%) and 37 were males (24.7%). Overall, the broad smile (5% BC) is the most attractive the participants judged the smile to be whereas the extra-broad smile (0% BC) is the less attractive smile. (Fig 3)

On average, medium broad smile (15% BC) was rated highest by the dental students and broad (5% BC) was rated highest by the laypeople. On average, narrow smile (25% BC) was rated lowest by the laypeople and extra broad smile (0% BC) was rated lowest by the dental students. There was statistically difference was observed between the rating of dental students and laypeople for narrow smile (25% BC), medium smile (15% BC), broad smile (5% BC) and medium-broad smile (10% BC) ($p<0.05$). Whereas statistically insignificant difference was observed in rating between dental students and laypeople for medium-narrow smile (20% BC) and extra broad smile (0% BC) ($p>0.05$). (Table 1)

The statistically insignificant difference was observed in rating between male dental students and male laypeople for buccal corridor variations ($p>0.05$). Whereas, the statistically significant difference was observed in rating between female dental students and female laypeople for narrow smile (25% BC), medium smile (15% BC), broad smile (5% BC) and medium-broad smile (10% BC) ($p<0.05$). (Table 2)

Figure 3

Mean Vas Score for Variations in Buccal Corridor Space

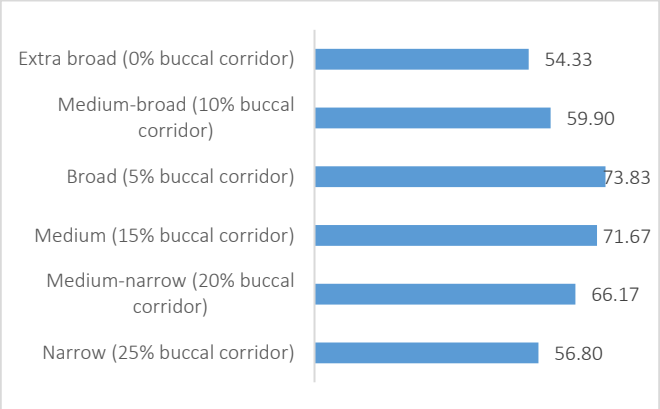


Table 1

Comparison Of Mean Vas Score For Variations In Buccal Corridor Space Between Dental Students And Laypeople

		Mean	SD	P-value
Narrow (25% Buccal Corridor)	Laypeople	48.53	17.30	0.001
	Dental students	65.07	13.37	
Medium-narrow (20% Buccal Corridor)	Laypeople	67.80	16.85	0.211
	Dental students	64.53	14.91	
Medium (15% Buccal Corridor)	Laypeople	64.93	18.26	0.001
	Dental students	78.40	19.17	
Broad (5% Buccal Corridor)	Laypeople	76.13	11.29	0.031
	Dental students	71.53	14.33	
Medium-broad (10% Buccal Corridor)	Laypeople	55.40	17.99	0.001
	Dental students	64.40	14.82	
Extra broad (0% Buccal Corridor)	Laypeople	54.00	25.73	0.852
	Dental students	54.67	17.17	

Table 2

Gender-Wise Comparison of Mean Vas Score for Variations in Buccal Corridor Space between Dental Students and Laypeople

Gender	Pictures	Groups	Mean	SD	P-value
Male	Narrow (25% Buccal Corridor)	Laypeople	50.00	16.66	0.105
		Dental students	59.44	17.89	
	Medium-narrow (20% Buccal Corridor)		64.74	15.40	0.060
		Dental students	54.44	16.52	
	Medium (15% Buccal Corridor)		63.68	16.05	0.338
		Dental students	67.78	8.08	
	Broad (5% Buccal Corridor)		72.11	12.28	0.770
		Dental students	70.83	13.95	
	Medium-broad (10% Buccal Corridor)	Laypeople	59.47	19.28	0.672
		Dental students	62.22	19.86	
	Extra broad (0% Buccal Corridor)	Laypeople	54.21	27.34	0.132
		Dental students	65.83	16.99	
Female	Narrow (25% Buccal Corridor)	Laypeople	48.04	17.62	0.001
		Dental students	66.84	11.20	
	Medium-narrow (20% Buccal Corridor)	Laypeople	68.84	17.32	0.698
		Dental students	67.72	12.95	
	Medium (15% Buccal Corridor)	Laypeople	65.36	19.06	0.001
		Dental students	81.75	20.45	
	Broad (5% Buccal Corridor)	Laypeople	77.50	10.70	0.019
		Dental students	71.75	14.56	
	Medium-broad (10% Buccal Corridor)	Laypeople	54.02	17.48	0.001
		Dental students	65.09	12.97	
	Extra broad (0% Buccal Corridor)	Laypeople	53.93	25.41	0.484
		Dental students	51.14	15.78	

DISCUSSION

The size of Buccal Corridor has been a debatable feature of smile esthetics. It is known as the space between the corners of the mouth and buccal surfaces of maxillary teeth when a person smile. Because orthodontists frequently extend arches to minimize crowding, it's important to know how variation in the display of tooth affects attractiveness of facial while smiling. Evidence has shown that broader smile is less desirable than a narrower smile, thus extractions can reduce crowding rather than expansion. (10-13) In this study, we assessed and compared the perception of BC spaces on smile aesthetics among dental students and laypeople.

The dental students and laypeople had various inclinations in the current research to assess the beauty of narrow smile, medium smile, broad smile and medium broad smile. Whereas there was no statistically significant difference in findings regarding the acceptability of smile arcs and Buccal Corridor observed in the analysis by Parekh et al. (14) Moore et al. found no statistically significant difference between female and male subjects while assessing the esthetics of smiles.(15) Gracco et al. and Martin et al. both described that BC attractiveness was not substantially associated with the gender and age of the raters. (16, 17) In the present research, statistically significant difference was observed in rating between female dental students and laypeople for narrow smile, medium smile, broad smile and medium-broad smile ($p<0.05$), whereas the perception of male dental students and male laypeople was almost same and they rated the Buccal Corridor similarly.

Ritter et al., Roden-Johnson et al. and Hulsey (4, 18, 19), argued that black or dark space was not an important factor in determining the esthetics of smiles. Parekh et al. however observed that both laypeople and orthodontists preferred smiles with minimum BC. (14) Another author indicated that orthodontists and laypeople like to smile more strikingly with minimal BC than those with broad BC. (16) However, there is a significant difference in the disposition of dark spaces.(20-25) Moore et al. find that the beauty of the smile biased by the length of BC when considering the entire face. Orthodontist will take into account that the understanding of smile esthetics could be considerably influenced by a minimal change in BC. (15) Medium broad smile (15% BC) has been found to be the most desirable among dental students in the current research, while broad smile (5% BC) has been found to be the most attractive among laypeople. Smile with BC 0 and 25 per cent, though received less appreciation. Overall, both dental students and laypeople prefer broad to medium smiles (5% to 15% BC).

While the perspective of the dental student may not necessarily reflect the opinion of the laypeople, we have categorized both dental students and laypeople as non-experts because the dental students who engaged in this work obtained little or no previous education concerning the assessment of the esthetics of smile. The dental students and laypeople have similar inclinations in the rating of BC spaces preferences. Such work seems useful using laypeople as raters. If the interpretation of esthetics by the orthodontist is not in line with the understanding of the patient, the patient may not consider the outcome satisfactory. Nevertheless, this does not imply that every person with wide arches should be accustomed to broad smiles. The original form of each patient's arch should be preserved in avoiding post-treatment relapse. Therefore, it is very necessary during diagnosis and treatment preparation to determine not only the width or form of the dental arch but also the alveolar bone width or shape.

CONCLUSION

The Buccal Corridor space is seen by laypeople and dental students as an imperative factor in shaping their esthetic assessments. Both the dental students and the dental students favored medium to wider smiles.

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