

Evaluation of Smile Perception: A Questionnaire Survey

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Abstract

Background: The smile plays an important role in facial expression. It influences a person's perceived attractiveness and is the cornerstone of social interaction. People mainly focus on another person's eyes and mouth during interpersonal interactions.

Aim: The survey was conducted to evaluate the knowledge, attitude, and awareness about the perception regarding smiles among patients, dentists, students, and staff of Karnavati Dental College.

Materials and method: This is a questionnaire survey. The questionnaire consisted of 16 questions along with images and it was distributed to 160 people.

Result: The perception of the smile was found to be almost similar among the four groups.

Conclusion: The consonant smile was unanimously liked. Strong correlation was found among the perception of participants liking toothy smiles, the ideal amount of buccal corridor, considering center-most two teeth, the position of teeth as an important factor in an aesthetic smile.

Keywords: Smile, esthetic, buccal corridor, gummy smile, consonant

I. INTRODUCTION

Smiling is a universal language. Smiling stimulates the amygdala- the emotional center of the brain-which releases neurotransmitters to boost an emotionally optimistic state. An exemplary smile enhances facial esthetics. The esthetics of the smile has an important influence on the discernment of an individual's appearance and personality. Smile analysis and

smile design have become salient components of orthodontic diagnosis and treatment planning. In public opinion, the smile ranks 2nd after the eyes as a significant trait in facial attractiveness. The smile plays a dominant role in facial expression. Facial attractiveness and smile aesthetics are firmly related to each other. An attractive, well-balanced smile is a pertinent treatment objective, in addition to functional occlusion.

Harmony between the smile arc and the curvature of the lower lip is called a consonant smile. A facial expression such as a smile is described as a better predictor of facial attractiveness, while dental attractiveness during a smile can change the level of visual attention.

The smile plays an important role in facial expression. It influences a person's perceived attractiveness and is the cornerstone of social interaction. People mainly focus on another person's eyes and mouth during interpersonal interactions

The purpose of this study was to find the perception regarding smiles among patients, dentists, students, and staff of Karnavati Dental College.

II. MATERIAL AND METHOD

The study was conducted via a questionnaire (TABLE 1-3, FIGURE 1,2) consisting of 16 questions along with photographs of the subjects. All the photographs of the patients were captured in a standardized protocol. These photographs are of 40*60mm standard size.

Table 1- Questionnaire

Question		Patient	Dentist	Student	Staff	Total	P value
1 Which smile do you like the most?	Consonant Smile	40	40	40	40	160	
2 Which is the most attractive feature among all smiles?	Lip Line	19	14	12	15	60	0.401
	Teeth	19	23	28	23	93	
	Gums	2	3	0	2	7	
3 Which Smile do you like the least among all?	Gummy Smile	2	0	3	3	8	0
	Reverse Smile	29	40	37	36	142	
	Smile with Crowded Teeth and no gum visible	9	0	0	1	10	
4 Do you like space between middle teeth?	yes	4	1	1	1	7	0.258
	no	36	39	39	39	153	
5 Do you like to have your lip covering your upper teeth when you smile?	yes	14	6	5	17	42	0.004
	no	26	34	35	23	118	

Table 2- Questionnaires

Question		Patient	Dentist	Student	Staff	Total	P value
6 Do you like symmetrical teeth or asymmetrical teeth?	yes	38	37	33	36	144	0.274
	no	2	3	7	4	16	
7 Do you like both upper and lower teeth visible when you smile?	yes	8	9	7	15	39	0.154
	no	32	31	33	25	121	
8 Do you consider shape of your teeth to be important in your smile?(square or rounded)	yes	35	37	38	38	148	0.539
	no	5	3	2	2	12	
9 Does shade of your teeth affect your view regarding your smile	yes	32	37	38	35	142	0.154
	no	8	3	22	5	18	
10 Do you think the centre most two teeth play an important role in aesthetic smile?	yes	29	39	39	35	142	0.001
	no	11	1	1	5	18	

Table 3- Questionnaire

Question		Patient	Dentist	Student	Staff	Total	P value
11 Do you like the smile which shows maximum number of teeth?	yes	12	26	9	7	54	0
	no	28	14	31	33	106	
12 Do you like a smile arc that follows the lower lip?	yes	36	34	32	38	140	0.206
	no	4	6	8	2	20	
13 Does position of teeth affect your view regarding anybody's smile?	yes	30	33	39	32	134	0.041
	no	10	7	1	8	26	
14 Do you like this space to be visible in your smile or not?	yes	5	11	19	5	40	0.001
	no	35	29	21	35	120	
15 Do you like gums to be visible in your smile or teathy smile?	yes	5	21	7	2	35	0
	no	35	19	33	38	125	
16 Does the glamour factor affect your view regarding smile?	yes	35	33	32	33	133	0.838
	no	5	7	8	7	27	

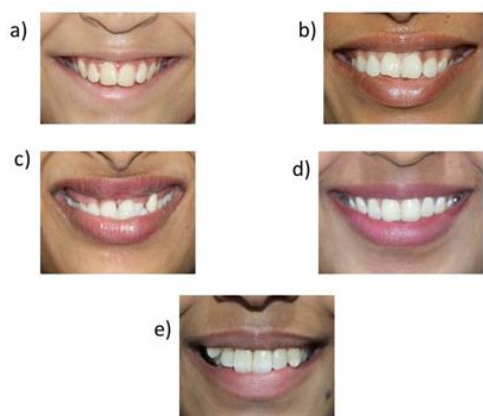


Figure 1-Which smile do you like the most and least?

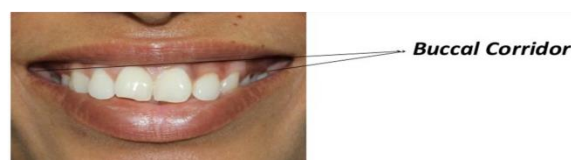


Figure 2- Do you like this space to be visible or not?

The closeup view of smiles was clicked by a DSLR Nikon D3200 Camera with a Ring flash (Metz 15 MS-1 Macro Ring Lite Digital Flash) on a tripod. These photographs were imported and digitally modified into Adobe Photoshop 6.0 version 13 software package (Adobe Systems, San Jose, Calif) was used to remove the slight imperfections that might influence the evaluation of facial attractiveness. The images were shown utilizing a PowerPoint presentation to all the participants at the same time. Previous studies were done by giving photographs in person and questionnaires, but as social media has become the part and parcel of our lives, digital media was used. A total of 160 participants were selected randomly and equally divided into 4 groups of patients, general dentists, students, and staff members (n=40). This was a single-blinded study, where participants were not informed about the study. This survey was done to evaluate the kind of smile participants preferred, comparison between the lip line, teeth, and gums as the most attractive feature, lip coverage, spacing between the teeth, symmetry, shape, shade, number, the position of teeth, buccal corridor, and gingiva, or if glamour affects the choice of people.

The patients included in the study had no previous orthodontic treatment, lip abnormalities, trauma to the dentition, anterior tooth extractions, dental implants, and had not undergone any prosthetic rehabilitation.

Ethical clearance was obtained from Karnavati School of Dentistry-No. KSDEC/21-22/Nov/28

III. STATISTICAL ANALYSIS

The data analysis was performed by SPSS for Windows version 20.

Pearson Chi-Square test is used to analyze the data. The data were reported descriptively with the use of tables.

IV. RESULT

All participants in this survey opted for consonant smile arc as the most admired smile. [Figure 1][Table 1]

37.5% of people who participated preferred lip line as the most attractive feature, 58.125% favored visibility of teeth, while 4.37% chose gums. Therefore, teeth are considered the most attractive feature by all the groups. But difference is statistically insignificant [P-value > 0.05]. [Table 1]

88.75% of participants disliked the reverse smile, 5% didn't like the gummy smile. 6.25% disapproved smile with crowded teeth and no gum visible. Result is highly significant [p-value < 0.05]. [Figure 1][Table 1]

Regarding spacing between the teeth, 95.62% of participants didn't prefer spacing between middle teeth, the result is insignificant [P-value > 0.05]. [Table 1]

73.75% of participants disfavored lower lip covering their upper teeth during a smile, with dentists and students being the highest, the result is statistically significant [P-value < 0.05]. [Table 1]

Regarding symmetry of teeth, 90% of participants liked to have symmetrical teeth rather than asymmetrical teeth, the result is insignificant [P-value > 0.05]. [Table 2]

75.62% of participants averted the visibility of upper and lower teeth when smiling, with staff contributing the highest percentage, the result is insignificant [P-value > 0.05]. [Table 2]

The shape of the teeth is considered the important factor in the attractiveness profile by 92.5% of participants, the result is insignificant [P-value > 0.05]. [Table 2]

The shade of the teeth greatly impacts 88.75% of participants' views while smiling, the result is insignificant [P-value > 0.05]. [Table 2]

88.75% of participants surmise that the centermost two teeth play an important role in an aesthetic smile, correlation is significant [P-value < 0.05]. [Table 2]

66.25% of participants depreciated the smile which shows the greatest number of teeth, out of which staff was 20.62% while the remaining liked the smile which shows the maximum number of teeth, the result is statistically significant [P-value < 0.05]. [Table 3]

A smile arc that follows the lower lip gives an esthetic appearance to the people, which was affirmed by 87.5% of participants, the result is insignificant [P-value>0.05].

[Table 3]

83.75% of the participant's perspectives concerning anybody's smile are altered by the position of the teeth, the result is statistically significant [P-value<0.05]. [Table 3]

Visibility of excessive buccal corridor in the smile is an undesirable trait for the participants [75%], the result is statistically significant [P-value<0.05]. [FIGURE 2] [Table 3]

Gummy Smile is an unsought attribute among 78.12% of the population, the result is statistically significant [P-value<0.05]. [Table 3]

Glamour exerts an influence on the viewpoint of 83.12% of participants in the matter of smile, the result is insignificant [P-value>0.05] [Table 3]

V. DISCUSSION

Psychological studies have shown that facial attractiveness affects the way a person is treated by others. The perception of esthetics is completely subjective and influenced by many factors including culture, social status, and level of education. In modern societies, a pleasant smile is an advantage in job interviews, social interactions. In orthodontic treatment, esthetics has traditionally been associated with profile enhancement. A smile is perhaps the most pleasant and wanted expression by each one of us. The most important esthetic goal in orthodontics is to achieve a "balanced" smile stated by Ackerman JL. Ackerman MB. Esthetics is the study of beauty and, together with ethics, logic, politics, and metaphysics, is a branch of basic philosophy.

The components of the smile should be considered not as rigid boundaries but as artistic guidelines to help the orthodontist treat individual patients. Orthodontists need to make every effort to develop a harmonious balance that will produce the most attractive smile possible for each patient being treated.

Hulsey concluded that a key component present in an esthetic smile was a consonance between the arcs formed between the incisal edges of the maxillary anterior teeth and the curvature of the lower lip. Various components of a balanced smile are lip line, buccal corridor, smile arc, upper-lip curvature, smile symmetry, frontal occlusal plane, dental components, gingival components

In the present study Patient, dentists, students, and staff show similarities in the perception of smiles, this is in accordance with the study by Flores-Mir et al stated that the level of dental education has little impact on esthetic perception¹. Inflamed or pigmented gums are least attractive while talking to someone or smiling. Patients, staff, dentists, students have different perceptions of attractiveness when evaluating the gingival margin height of a maxillary central incisor². Elimination of maxillary gingival display helps to improve smile attractiveness, whereas the coverage of maxillary incisor edges has a negative influence³. Both smile arc and gingival display amount extensively affect the perception of smile attractiveness. Flat smile arcs are preferred with insufficient gingival display, and vaulted smile arcs are preferred with excessive gingival display⁴. Gingival display negatively influenced the perception of smile attractiveness in all rater groups.

Black triangles present between central incisors are also negatively rated points in smile esthetic and facial appearance. Midline diastema and Spacing between the teeth, crooked and asymmetric teeth with crowding are also considered as negative factors for smile appearance. Nouredine et al stated that the width of the midline diastema has a significant impact on smile esthetics, even when associated with lateral spaces⁵.

In general, asymmetric alterations make teeth more unattractive to not only dental professionals but also the lay public⁶. Size of teeth, visibility of teeth, and upper lip position are critical factors in the self-perception of smile attractiveness (social dimension). Color of teeth and gingival display are critical factors

in satisfaction with smile appearance (individual dimension)⁷.

Whiter the teeth the, more comfortable person is to show his/her teeth and yellower the teeth person tends to speak less and show less tendency to smile. Square-shaped teeth with sharp angles indicate masculine features, on other hand, rounded or square-rounded teeth indicate feminine features. Incisor shape is the key determinant of esthetic preferences; round incisors are the most esthetic⁸. It is recommended to improve smile esthetics by mildly rounding the mesial and distal corners of square incisors. The shape of the anterior teeth, especially the maxillary teeth, which are displayed during smiling and speech, substantially contribute to fulfilling a patient's expectations from orthodontic treatment. According to Phillips, the shape of the anterior teeth has a considerable influence on smile esthetics. In addition, Goldstein stated that tooth form and the smile arc are more critical elements than the golden ratio in tooth size.

Ma et al, observed that discrepancies related to central incisors had a much greater impact on smile esthetics than lateral incisors⁹.

Orthodontists are more sensitive to the buccal corridors than orthodontic patients and laypersons. It is only necessary for the orthodontists to consider reducing the patients' buccal corridors when the patients' BCAR is $\geq 15\%$ ⁸. Laypersons and orthodontists prefer smiles in which the smile arc parallels the lower lip and buccal corridors are minimal¹⁰. The buccal corridor is the space created between the buccal surface of the posterior teeth and the lip corners when the patient smiles. Orthodontists refer to buccal corridors as "negative" spaces. Moore et al. stated that when the buccal corridor is 28% as medium-narrow, 15% as a medium, 10% as medium-broad, and 2% as broad smile fullness.

As per the results, everybody prefers to like consonant smiles i.e. when the incisal edge of the upper teeth forms a curvature on the lower lip [Smile Arc]. Patients consider lip line as the most attractive feature among all smiles, whereas students opted for teeth. A reverse

Smile is the least accepted trait in comparison to a gummy smile and smiles with crowded teeth and gum visible. Smile arcs with excessive curvature or flattening or reverse curvature have a negative effect on participants' perceptions^{11 12}. Among all 4 groups, a minority of patients and staff members selected that they would like to have their upper teeth covered by lower lip during smiling, whereas the majority of dentist and student groups wouldn't like to have the same. According to Peck et al. lip coverage of the maxillary incisors increases with age. Therefore, a high smile with 100% of the maxillary incisor exposure and a contiguous band of gingiva is characteristic of a younger population. The maximum number of participants opted for visibility of upper anterior teeth during the smile. Anterior teeth play an important role in the esthetics of a smile^{13 14 15}.

Orthodontists, general dentists, and laypeople detect specific dental esthetic discrepancies at varying levels of deviation, which may aid the dental professional in making specific treatment recommendations¹⁶. Lay people were less judgemental than orthodontists in all of the discrepancies. The differing levels of detectability demonstrate that minor variations in specific dental esthetic discrepancies may not be an important concern to most patients.

In previously done studies, there were not enough data showing the perception of people regarding all the factors associated with the smile. So this study was done to get a proper view of the general public's perception.

Perhaps the influence of the orthodontic profession on overall patient well-being can be best expressed by the words of Jean Cocteau.

"If there is a defect in the soul, it cannot be corrected on the Face; but if there is a defect on the face and one corrects it, it can correct a soul!"

VI. CONCLUSION

The perception of a smile was almost similar in all four groups.

The consonant smile was unanimously liked. Strong Co-relation was found among the perception of participants liking toothy smiles,

the ideal amount of buccal corridor, considering center-most two teeth, the position of teeth as an important factor in an aesthetic smile.

All groups consider teeth as the most attractive feature, considered shape, symmetry, and shade to be important factors. Glamour influences the perception of smiles of the groups.

CONFLICT OF INTEREST DECLARATION

We declare that there is no conflict of interest between the authors

CONTRIBUTION DETAILS:

1. Dr.Alap Shah. : Preparation of manuscript and conducted the survey
2. Dr.BharviJani: Conception of idea
3. Dr. Kinnari Shah : Analysis of data
4. Dr.NidhiAgarwal : Review of manuscript adding scientific content
5. Dr.Aarohi Singh Rathor: Compilation of data
6. Dr.AditiMehta : Review

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