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ORTHODONTIC PERCEPTION OF SMILE ESTHETICS

Orthodontics

Dr. Ahuti Shah* Senior Lecturer, Department of Orthodontics and Dentofacial Orthopaedics, Faculty of Dental Science, Dharmsinh Desai University, Nadiad *Corresponding Author
Dr. Prachi Shah Bds, Dental Surgeon
Dr. Tejas Barot Bds, Dental Surgeon

ABSTRACT

Introduction: Esthetics has become a major concern among patients and orthodontists. It has become the main reason why patients seek orthodontic treatment. The present survey evaluates the differential perception of smile esthetics among clinicians, orthodontists and laypeople. **Material and method:** The sample consisted of 300 selected to evaluate the orthodontic perception on smile esthetics from the Department of Orthodontics and Dentofacial Orthopedics, Faculty of Dental Sciences, Dharmsinh Desai University. Subjects in divided into three group to evaluate the orthodontic perception on smile esthetics. The survey form with frontal smile photograph and a visual analogue scale was given for scoring to all three study groups. The data was collected and complied and statistical analysis was done using one-way analysis of variance (ANOVA) test. **Results:** 300 sample were divided equally in three groups namely orthodontists, layperson and general dentist, out of which Layperson showed maximum of score between 7 and 8, dentist showed maximum score between of 5 and 6 and orthodontist showed maximum score of between 3 and 4. Present study showed statistically significant results that the smile used for survey purpose was esthetically pleasant and all the three groups were found to be highly critical, the group comprising of orthodontists being the most critical about smile esthetics as they rated accordingly. **Conclusion:** The present study demonstrated the differences and similarities to how Orthodontists, Dental Professionals and Lay persons evaluated the smile esthetics. There wasn't any significant difference in the ratings because all the three groups showed similar tendencies in rating the preferences of gummy smile and midline shift. The group conducting most strict smile assessment were orthodontists, followed by clinicians and laypersons. However, no statistical differences were found amongst groups.

KEYWORDS

orthodontics, smile esthetics, visual perception

INTRODUCTION

From ancient societies and cultures to our modern society, a great emphasis has been placed on facial esthetics and physical attractiveness. The concept of esthetics is subjective, so it is very hard to determine objective criteria for defining the concept of beauty. The word esthetics is derived from a Greek word `aesthesis` which means perception[1]. Every person has its own parameters of defining beauty of a Subject. Appearance of a personality plays a major key role in social dealings. It has a great effect on the personality development, getting employment, showing performance, self-belief and being victorious. Smile, defined as a facial expression characterized by upward curving of the corners of the mouth, is often used to indicate pleasure, amusement, or derision[2]. The smile, which is essential to express friendliness, agreement, and appreciation, and to convey compassion and understanding, should not be ignored in diagnosis and treatment planning. Assessing beauty is a highly subjective matter. Meanwhile, assessing patient's smile allows the clinician to see what needs to be done, what can be done and what should be accepted[3]. Furthermore, perception of esthetics varies considerably among individuals and is influenced by personal experiences as well as by the social environment. Thus, in addition to assessing patient's smile in geometrical and objective terms, it is also necessary to scientifically understand smile pleasantness from the point of view of laypeople, orthodontists and clinicians[4]. Orthodontic treatment is based on occlusal relationships, but with the changing paradigm, facial esthetics and smile have gained importance. The purpose of this study is to compare the perception of smile esthetics by three panel groups include Orthodontists, Dental professionals and Lay persons.

AIM:

To evaluate the differential perception of smile esthetics amongst clinicians, orthodontists and laypeople.

MATERIAL AND METHODOLOGY

The sample consisted of 300 selected to evaluate the orthodontic perception on smile esthetics from the Department of Orthodontics and Dentofacial Orthopaedics, Faculty of Dental Sciences, Dharmsinh Desai University.

Description of sample

Total of 300 subjects selected to evaluate the orthodontic perception on smile esthetics. Subjects are divided into three group.

Group -1: 100 Orthodontists to evaluate photograph of orthodontic perception on smile esthetics. Group-2: 100 Dentists to evaluate photograph of orthodontic perception on smile esthetics. Group-3: 100 Layperson to evaluate photograph of orthodontic perception on smile esthetics.

The photographic set-up consisted of a tripod (Harison Mega Mx-2100) that held camera (Nikon, Coolpix P5100) with a built-in flash. The camera was used in its Automatic Focus(AF) mode; this was done to reduce intra-operator error. The distance between the camera and the stool was fixed at 4 feet for all the subjects. Frontal and Three-quarter view unforced, natural smiling photograph (Fig. 1) were taken for each subject, by the same investigator at a constant object to lens distance with the same digital camera Nikon, (Model: Coolpix P5100) The images were then transferred to computer software (Adobe Photoshop), they were cropped with vertical (nose tip and soft-tissue pogonion) and transverse (perpendicular drawn down from the zygomatic prominence limits). Frontal facial photograph of patient's smile was edited. In other words, they were cropped so as to evince the lower third of the face, particularly the smile. Examiners were asked to classify the photographs using scores from 1 to 9, as follows: esthetically unpleasant (scores 1, 2 or 3); esthetically acceptable (scores 4, 5 or 6) or esthetically pleasant (scores 7, 8 or 9) (Fig 1). Assessment was carried out by 100 orthodontists, 100 clinicians and 100 laypeople who also filled out a questionnaire so as to establish an association between smile unpleasantness and factors such as lip thickness, smile height, colour gradation, teeth size and crowding.

Figure 1- Frontal smile photograph

Visual analogue scale used to classify the photograph using scores from 1 to 9, as follows: esthetically unpleasant (scores 1, 2 or 3);

esthetically acceptable (scores 4, 5 or 6) or esthetically pleasant (scores 7, 8 or 9). Data were collected for descriptive statistics, highlighting the prevalence of pleasant, acceptable and unpleasant smiles as well as the mean scores attributed by each evaluator. The scores attributed by the three groups of evaluators (orthodontists, clinicians and laypeople).

Statistical Analysis

1) ANOVA Test (Analysis of Variance)

ANOVA is a particular form of statistical hypothesis testing heavily used in the analysis of experimental data. A test result (calculated from the null hypothesis and the sample) is called statistically significant if it is deemed unlikely to have occurred by chance, assuming the truth of the null hypothesis. A statistically significant result, when a probability (p-value) is less than a threshold (significance level), justifies the rejection of the null hypothesis, but only if the a priori probability of the null hypothesis is not high. In the typical application of ANOVA, the null hypothesis is that all groups are simply random samples of the same population. For example, when studying the effect of different treatments on similar samples of patients, the null hypothesis would be that all treatments have the same effect (perhaps none).

RESULTS

According to Table 1 and chart 1, Lay person shows the highest average of 7.42 followed by Dentists and the Orthodontists had the least average score. The result was significant with p value<0.001.

According to Table 2, maximum number of laypersons (37) had given score 8. Maximum number of Dentists (40) had given score 6. Maximum number of Orthodontists (31) had given score 4. This variation is significantly different between the three groups One-way analysis of variance (ANOVA) was used to compare smile esthetics and difference among the three groups.

Table1: One-way analysis of variance (ANOVA)

Groups	Count	Sum	Average	Variance	F	P-value
Layperson	100	742	7.42	1.195556	385.4596	0.000283
BDS	100	581	5.81	0.902929		
Orthodontist	100	342	3.42	1.054141		

According to the one-way ANOVA mean esthetic score as evaluated by 3 panel group for esthetically unpleasant, esthetically acceptable and esthetically pleasant. Present study shows statistically significant result that it is esthetically pleasant.

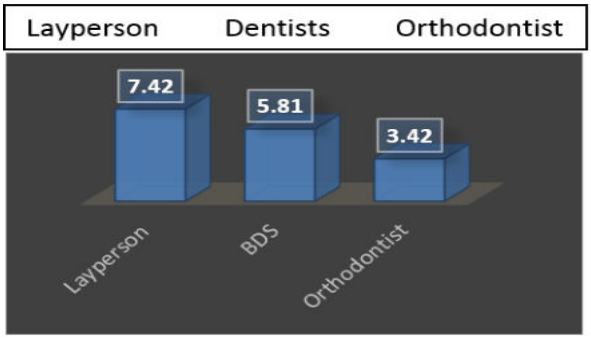

Chart 1: Mean esthetic score given by 3 panel groups

This showed that all the three groups are very critical about smile esthetics as they rated wisely. According to the mean VAS score it can be seen that dentist were less discriminating of these alterations as compared to the orthodontists and similarly lay person were less discriminating than dentist. Layperson showed maximum of score between 7 and 8, dentist showed maximum score between of 5 and 6 and orthodontist showed maximum score of between 3 and 4.

This variation is significantly different between the three groups. Orthodontist could detect the discrepancies at a higher level of distinction than others.

The level of significant varied shown in table 2. As post hoc analysis was also carried out, it showed significant difference between results given by layperson and dentists; and between results given by laypersons and orthodontists. (Table 1).

Table 2: Comparison of mean esthetic scores among 3 panel group using post hoc analysis.

	Layperson	BDS	Orthodontist
Score 1	0	0	0
Score 2	1	1	23
Score 3	0	0	29
Score 4	0	3	31
Score 5	3	34	17
Score 6	10	40	0
Score 7	36	19	0
Score 8	37	3	0
Score 9	13	0	0

DISCUSSION

Smile esthetics has become a major concern among patients and orthodontists. It has been the main reason why patients seek orthodontic treatment. The perception of beauty is associated with pleasure while seeing an object or a person, and while hearing a sound[5]. For this reason, beauty is seen as a highly subjective feeling that results from individual factors such as sex, race, education and personal experiences, as well as social factors such as the environment and the media which has been increasingly responsible for globalizing the concept of beauty. Dale Carnige[6] said that most important ways to win friends and influence people is to smile. It is important for orthodontists to make every effort to develop harmonious balance that will produce the most attractive smile possible for each person being treated.

Wylie[7] emphasized, "The goal of the orthodontic treatment should be the attainment of best possible esthetic results both dentally and facially. "Over the years various studies have been done on human faces describing smile esthetics by taking various quantitative and qualitative soft tissue measurements of the face at rest as well as during smile to describe the various parameters influencing subject's smile. Orthodontists play a very important role in creating new smiles. It is essential to understand the quest for better appearance among the new generation. An attractive and well-balanced smile influences the perception of the individual appearance and personality therefore it is a valuable personal asset[8]. The goal of the orthodontic treatment should be the attainment of best possible esthetic results. The present study demonstrated the differences and similarities in the perception of smile esthetics among orthodontists, dentists and laypersons. There wasn't any significant difference in the ratings because all the three groups showed similar tendencies in rating the preferences of gummy smile and midline shift.

There was no significant difference in the esthetic scores between male and female raters for all the three groups, however Geron and Atalia reported that male and female raters scored images with gingival exposure differently. Supporting the present study McNamara L et al[9] showed significant agreement in the judgments between laypersons and orthodontists regarding perception of smile. Contradicting to our study, the results of the study by Kokick showed that laypersons are less judgmental about the perception of esthetics as compared to the dentists and orthodontists.

Peck et.al and Tjan and Miller[10] m found that low smile lines are predominantly male characteristics (2.5 to one male to female) and high smile line is predominantly female (two to one female to male). Vig and Brundo[11] found sexual dimorphism maxillary anterior teeth display was almost twice as often in women as in men, the men displayed much more of mandibular incisors, and females were found to be twice likely as males to have a gummy smile. Rigsbee et.al[12] found that women have greater facial animation characteristics than do men. Hence this study focused mainly on smile esthetics of female subjects.

According to the present study mean VAS score it can be seen that dentist were less discriminating of these alterations as compared to the orthodontists and similarly lay person were less discriminating than dentist. Layperson showed maximum of score between 7 and 8, dentist showed maximum score between of 5 and 6 and orthodontist showed maximum score of between 3 and 4. This variation is significantly different between the three groups. Orthodontist could detect the discrepancies at a higher level of distinction than others.

Orthodontists emphasized the amount of gingival display and thin lips as the most prevalent features in unpleasant smile esthetics. Laypeople, on the other hand, emphasized stained, crowded, disproportional teeth as the features that most contribute to an

unpleasant smile; whereas clinicians associated smile unpleasantness with stained, disproportional, small teeth[12].
According to this statistical data, all three groups did not differ statistically in the mean esthetic scores evaluated by three panels ($p>0.05$).

CONCLUSION

The present study demonstrated the differences and similarities to how Orthodontists, Dental Professionals and Lay persons evaluated the smile esthetics. There wasn't any significant difference in the ratings because all the three groups showed similar tendencies in rating the preferences of gummy smile and midline shift.

The group conducting most strict smile assessment were orthodontists, followed by clinicians and laypersons. However, no statistical differences were found amongst groups. Present study shows three groups are very critical about smile esthetics as they rated wisely. Orthodontists, Dentists and Laypersons shared more similarities than differences when evaluating smile esthetics. The understanding of esthetic perception is extremely important as this approach can affect the treatment decisions sought by the patients (Lay persons).

REFERENCES

1. Turkkahraman H, Gokalp H, Facial profile preferences among various layers of Turkish population. Angle Orthod2004; 74: 640-647.
2. Snow SR. Esthetic Smile Analysis of Maxillary Anterior Tooth Width: The Golden Percentage. J Esthet Dent 1999 11:177-84.
3. Peck S, Peck L, Kataja M. The gingival smile lines. Angle Orthod 1992; 62(2): 91-100.
4. Nikgoo A, Alavi K, Alavi K, Miefazaelian A. Assessment of the golden ratio in pleasing smiles. World J Orthod. 2009; 10(3):224-8.
5. Naik P, Manohar MR, Shivaprakash G, Jabeen N. Smile Esthetics – Evaluation of Differential Perception among Laypersons, Dental professionals and Orthodontists. IOSR-J Dent Med Sci; Jan 2014;13(1):35-43.
6. HVC, Silva MC, Pascotto RC, Terada HH, Terada RSS. Avaliação estética de pacientes submetidos a tratamento ortodôntico. Acta Scient Health Sci. 2010;32(1):93-100.
7. Wylie WL. The Mandibular incisor-Its Role in Facial Esthetics; Angle Orthod 1955; 25: 32-41. 8. Smile esthetics from the layperson's perspective. Am J Orthod Dentofacial Orthop. 2011;139(1):91-101.
9. McNamara L. et al. Hard and soft-tissue contributions to the esthetics of the posed smile in growing patients seeking orthodontic treatment. Am J Orthod Dentofacial Orthop 2008; 133:491-9.
10. Tjan AH, Miller GD, Some esthetic factors in a smile. J Prosthet Dent 1984; 51: 24-28.
11. Vig RG, Brundo GC. Kinetics of anterior tooth display. J Prosthet Dent 1978; 39:502-504.
12. Rodrigues CDT, Magnani R, Machado MSC, Oliveira OBO. The perception of smile attractiveness. Angle Orthod. 2009;79(4):634-9.