RESEARCH ARTICLE

THE PERCEPTION OF SMILE ESTHETICS IN DIFFERENT MALOCCLUSIONS AMONG ORTHODONTISTS AND LAYPERSONS – AN EYE TRACKING STUDY

*Lakshmi Mounika, M. K. M.

Dr. C.V. Padmapriya Vishnu Dental College, Vishnupur Bhimavaram- 534202 India

ARTICLE INFO	ABSTRACT
	Background: One of the important aspect of facial esthetics is smile. Patients having malocclusion do not pose a full smile as they are conscious of the compromised esthetics of their dentition. Correction of malocclusion harmonizes the soft tissues and results in enhanced facial esthetics. In order to obtain a clinically satisfactory outcome, it is imperative one must understand that what is beautiful and attractive to the orthodontist and general dentists might not seem attractive to the patients. This study endeavors to understand more closely the most striking malocclusal trait from laypersons point of view. So the aim of the study is to compare smile esthetics in different malocclusal traits among orthodontists and laypersons using Visual Analog Scale. Sample consists of pre treatment full frontal smiling photographs young adult patients and were categorized into 4 groups based on their skeletal relationship. Each group consists of 5 photographs which were standardized and were jumbled and projected. These photographs were rated for attractiveness by both orthodontists and lay persons and the results were subjected to statistical analysis. Class II division 1 malocclusion was perceived as least attractive followed by class II division 2 malocclusion and ideal occlusion was rated as very attractive by the orthodontists and laypersons. There was no statistically significant difference in the perception between orthodontists and lay persons for different malocclusions.

INTRODUCTION

Smile as stated by Webster dictionary is defined as a change in facial expression that involves a sparkle in eyes, an upper curvature at the corners of the lips, no sound emission and less distortion of muscle forms than with a laugh (Webster, 1961). Facial attractiveness and smile attractiveness appear strongly connected to each other. The fact is that in a social interaction, one's attention is mainly directed toward the mouth and eyes of the speaker's face. As mouth is the center of communication in the face, smile plays an important role in facial expression and appearance (Vander Geld, 2007). An esthetically pleasing smile is not only dependent on components of macroesthetics but also on micro and miniesthetics. All of these components are supposed to form a harmonic and symmetric entity (Ekman, 1990). When cephalometric-based diagnosis and treatment planning hit full stride in the 1950s and 1960s, esthetics in orthodontics was defined primarily in terms of the profile (Ackerman, 1999). However, current trend is geared towards enhancing facial esthetics and creating a beautiful smile. Smile esthetics has become a major concern among patients and orthodontists. The subject of facial esthetics is pre- eminently important to orthodontists. We tend to forget that ultimate source of our esthetic values should be the people, not just ourselves Some studies report that

orthodontists are less tolerant than laypersons when it comes to evaluating the dentofacial characteristics (Bilal, 2015). Pinho *et al.* (2007), evaluated the impact of asymmetrical anterior teeth on the smile esthetics and concluded that the orthodontists and prosthodontists are more critical than laypeople of midline deviation and changes in the gingival margin of the upper central incisors. In order to obtain a clinically satisfactory outcome, it is imperative one must understand that what is beautiful and attractive to the orthodontist and general dentists might not seem attractive to the patients. Scientific studies investigating the esthetic standards of the smile in laypersons are of paramount importance. This in turn has direct impact on success of treatment and satisfaction of the patient (Scott, 2006 and Arnett, 1993). Patients having malocclusion do not pose a full smile as they are conscious of the compromised esthetics of their dentition. People who got their malocclusion treated had a more positive assessment of their appearance. Dentofacial attractiveness is the main motivating factor in taking orthodontic treatment. Patients have their own perception of likes and dislikes for various malocclusion traits.To understand the perception of patient is important for success of orthodontic treatment (Srivastava, 2013). This study endeavors to understand more closely the most striking malocclusal trait from laypersons point of view.

MATERIALS AND METHODS

Sample consists of pre-treatment full frontal smiling photographs, 5 each of class I bimaxillary protrusion, class II

Corresponding author: **Lakshmi Mounika, M. K. M.,**
Dr. C.V. Padmapriya Vishnu Dental College, Vishnupur Bhimavaram- 534202 India

division 1 malocclusion, class II division 2 malocclusion and ideal occlusion of young adult patients. An informed consent was obtained from the subjects to use their photographs for the purpose of this study. Patients who met the following inclusion criteria were included in the study.

- Same ethnicity, race between 20-25 years of age.
- Absence of obvious facial characteristics or style features that would distract the evaluators and effect the results (scars, birthmarks, unusual hair or make-up).
- Absence of deviated dental characteristics, facial asymmetry and gross anomalies.
- Patients who posed for the photographs with eyes open and a natural looking smile

MATERIALS AND METHODS

Each group consisted of 5 full frontal photographs which were standardised by changing the colour to black and white shades, cropping full face with posed smile in 4x6 inch proportions so that the head would be same in all photographs and eyes blocked to eliminate the bias during scoring. All the photographs were numbered from 1-20 and were jumbled and projected (Figure 1a and 1b).

These photographs were rated for attractiveness using Visual Analog Scale with the rating 1 to 5, 5 being the most attractive and 1 being the least attractive. Both orthodontists and lay persons were blinded in this study and were approached for attractiveness rating. 20 orthodontists and 20 lay persons participated in the study and were asked to rate for each photograph and the reason for scoring was given. The SPSS 18.0 software was used for statistical purpose. The mean scores of the photographs were evaluated and the comparison of mean aesthetic perceptions of different photographs by orthodontists and laypersons was performed using one way ANOVA test, Post Hock Tukey test for intragroup comparison and unpaired t test for intergroup comparison were used. Comparison of mean aesthetic perceptions of different photographs between orthodontists and lay persons was done using unpaired t test.

RESULTS

The scores in the order of perception from least attractive to most attractive perceived by the layperson and the orthodontist were shown when intergroup comparision was made, there was statistically significant difference between the smile perception within the groups.
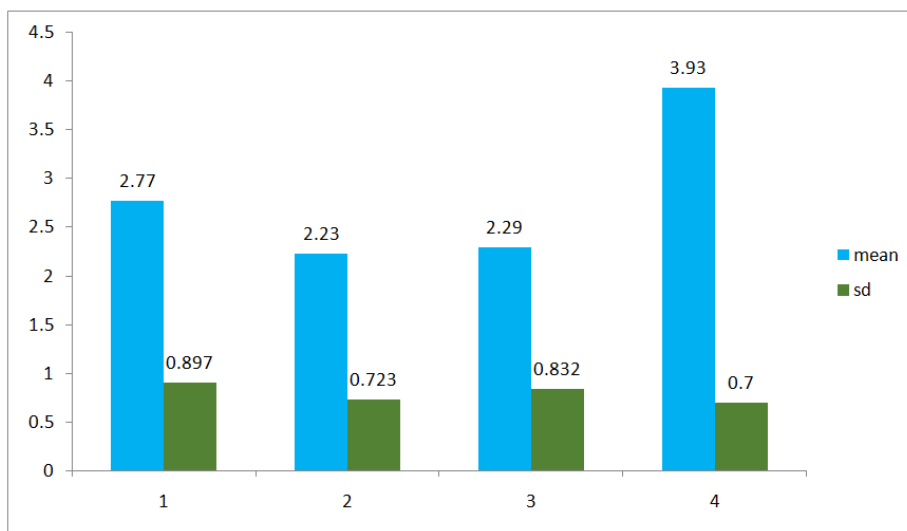
Graph 1. Comparison of mean esthetic perception of different malocclusions by orthodontists
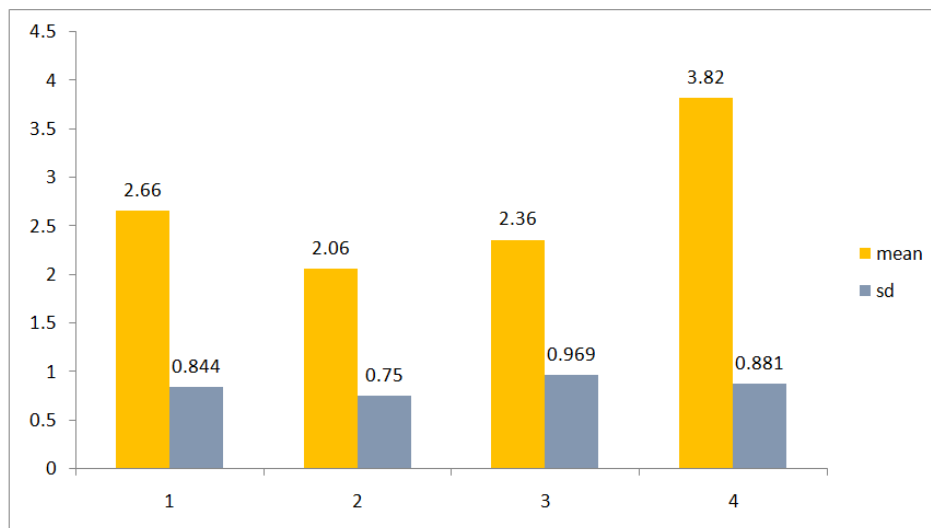
Graph 2. Comparison of of mean esthetic perception of different malocclusions by lay persons

Figure 1a (1-10). Randomly distributed image of patients with normal and different

Figure 1b (11-20). Randomly distributed images of patients with normal and different malocclusions

Class II division 1 malocclusion was perceived as least attractive (Mean=2.23, SD= 0.7230) followed by class II division 2 malocclusion (Mean= 2.29, SD =0.832) and ideal occlusion was rated as very attractive (Mean= 3.93, SD= 0.7) by the orthodontists [Graph 1].

There was a statistically significant difference (p=0.000) when all the three malocclusions were compared with ideal occlusion. There was no significant difference in the esthetic perception between class I bimaxillary protrusion and class II division 2 patients (p= 0.069), class II div1 and class II div 2 (p= 0.069).
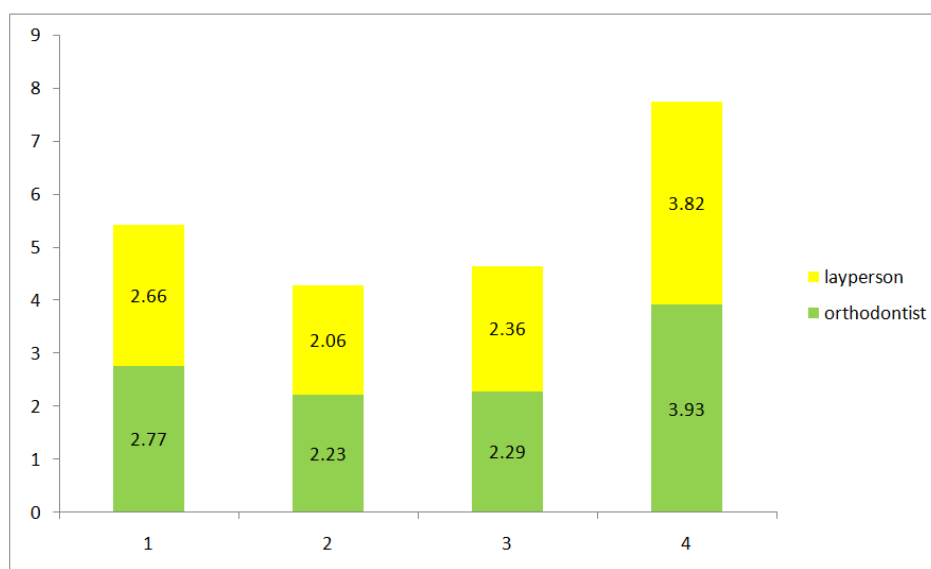
Graph 3. Comparison of mean esthetic perception of different malocclusions between orthodontists and lay persons

When intergroup comparision was made, there was statistically significant difference (p=0.000) between the smile perception within the groups. Class II division 1 malocclusion was perceived as least attractive (Mean = 2.06, SD =0.750) followed by class II division 2 malocclusion (Mean = 2.36, SD=0.969) and ideal occlusion was rated as very attractive (Mean = 3.82, SD= 0.881) by the laypersons [Graph 2]. Statistical significance (p=0.000) observed when all the three malocclusions were compared with ideal occlusion. There was no significant difference in the esthetic perception between class I bimaxillary protrusion and class II division 2 patients (p= 0.069), class II div1 and class II div 2 (p= 0.069). There was no statistically significant difference in the perception between orthodontists and lay persons for different malocclusions [Graph 3].

DISCUSSION

Assessment of smile esthetics is important to determine whether malocclusions have influenced the perception of lay people and is there any difference in the perceptions between orthodontists and laypeople. Although high correlations have been reported between professionals and lay people some investigators have shown that professionals are more critical than lay people while others found the opposite. In the present study, smile esthetics were compared between different malocclusions like bimaxillary protrusion cases, class II div 1 cases, class II div 2 and ideal occlusion cases. The highest scoring for smile attractiveness was given to the ideal occlusion group by the orthodontists with a mean score of 3.93 and least scoring was given for class II division 1 cases with a mean of 2.23 which was rated as unattractive. The reasons for low scoring was due to increased incisal and gingival display. Our findings were supported by Manouchehr et al who concluded that gingival display of more than 2mm was perceived as unattractive by general dentists (Rahmati Kamel, 2014). According to peck *et al.* (Peck, 1992), a high smile with full incisor exposure and a contiguous band of gingiva is a characteristic of younger population while McNamara et al stated that there was no correlation between decreased smile esthetics in patients with reduced incisor display (McNamara, 2008).

In a recent study done by Suh et al the amount of upper incisor display during posed smile was significantly increased in individuals with vertical maxillary excess as observed in class II division 1 cases. In maxillary antero posterior excess cases the upper lip is usually short and curled up, increasing the gingival visibility and thus making the smile unattractive (Suh, 2006). Patients with ideal occlusion were rated attractive with a mean score of 3.82, followed by class I bimaxillary protrusion cases with a mean of 2.66 and least scoring was given for class II division 1 cases and were rated as unattractive with a mean of 2.06 by the laypersons. When intergroup comparisions were made within the groups class I Bimaxillay protrusion cases were rated high for esthetic perception both by the orthodontists and layprsons compared to class II div 1 and class II div 2 cases. This can be attributed to the gingival exposure which gives patients a youthful appearance. Statistically significant difference was not observed between class I bimaxillary protrusion and class II division 1 malocclusion, class II div 1 malocclusion and class II division 2. Both Orthodontists and lay persons have given highest rating for the ideal occlusion group and the comparison between the groups showed a statistically significant difference between the different malocclusions. The perception of smile was same for the both groups indicating that, what was pleasing for orthodontist was also pleasing for lay persons. However the mean scores for all the photographs were higher for orthodontists when compared to lay persons. Both the orthodontists and laypersons perceived smiles with more amount of gingival and incisal display as unattractive. The other factors like crowding spacings, smile arc were also perceived as unattractive by laypersons.

Conclusion

Following conclusions were drawn from present study:

1. Smile esthetics of patients with Class II division 1 malocclusion was perceived as least attractive followed by class II division 2 malocclusion and ideal occlusion was rated as very attractive by the orthodontists.
2. Smile esthetics of patients with Class II division 1 malocclusion was perceived as least attractive followed

by class II division 2 malocclusion and ideal occlusion was rated as very attractive by the laypersons.

3. There was no statistically significant difference in the perception of smile esthetics between orthodontists and lay persons among different malocclusions.

REFERENCES

Ackerman, J.L., Proffit, W.R., Sarver, D.M. 1999. The emerging soft tissue paradigm in orthodontic diagnosis and treatment planning. *Clin Orth Res.,* 2:49-52.

Arnett WG, Bergman RT. Facial Keys to orthodontic diagnosis and treatment planning part II. *Am J Orthod Dentofacial Orthop.*, 103: 395-411.

Bilal, R. 2015. A comparative analysis of smile perception between orthodontists and laypersons. *Pakistan Oral & Dent J.,* 35(4):596-600.

Ekman P, Davidson RJ, Friesen WV. 1990. The Duchenne smile: emotional expression and brain physiology. II. *J PersSoc Pdychol.*, 58: 342-53.

McNamara L, McNamara JA Jr, Ackerman MB, Baccetti T. 2008. Hard and soft-tissue contributions to the esthetics of the posed smile in growing patients seeking orthodontic treatment. *Am J Orthod Dentofacial Orthop.*, 133:491-9.

Peck S, Peck L, Kataja M. 1992. Some vertical lineaments of lip position. *Am J Orthod Dentofacial Orthop.*, 101:510-24.

Pinho S, Ciriaco C, Faber J, Lenza MA. Impact of dental asymmetries on the perception of smile esthetics. 2007. *Am J Orthod Dentofacial Orthop.,* 132: 748-53.

Rahmati Kamel M., Samadi, E., FatereSamadi, Khafri, S. 2014. Comparison of The Perception of Smile Esthetics Among General Dentists and Specialist. *J Dentomaxillofacial Rad, Path Surg.,* Vol 3, No 2

Scott RC, Goonewardene SM, Murray K. 2006. Influence of lips on the perception of malocclusion. *Am J Orthod Dentofacial Orthop.*, 130: 152-62.

Srivastava, S.C., Verma, P., Panda, S., Anita, G. 2013. Perception of esthetics of different malocclusion traits by laypersons. *J Indian Orthod. Soc.*, 47(4):474-8.

Suh YJ, Nahm DS, Choi JY, Baek SH. 2006. Differential diagnosis for inappropriate upper incisal display during posed smile: Contribution of soft tissue and underlying hard tissue. *J CraniofacSurg* 2009; 20-12.

VanderGeld P, Oosterveld P, Van Heck G, Kuijpers-Jagtman AM. 2007. Self – perception of smile attractiveness. Angle Orthod., 77;5;759-65.

Webster N, Gove PB. 1961. Webster's third new international dictionary of the English language unabridged. London; Springfield (Mass): G. Bell; G.and C. Merriam.

****