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Perception of Lay Persons and Prosthodontist on Characteristics of Pleasant Smile

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Abstract:*A beautiful smile plays a fundamental role in facial beauty and is among the most important reasons for patients seeking esthetic dental treatments. In order to provide esthetic dental treatments, clinicians should have adequate knowledge of principles of orofacial and dental esthetics and the requirement and expectations of patients. The purpose of this study was to evaluate, analyze and compare the perceptions of smile esthetics and between a Prosthodontist and Lay person according to the 10 commandments of smile described by Dr. Machado.*

Keywords:*Smile esthetics, smile perception, golden proportion.*

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I. Introduction

A beautiful smile plays a fundamental role in facial beauty. At present, it is among the most important reasons for patients seeking esthetic dental treatments. Esthetic criteria and perception of beauty vary from one person to another and are influenced by the social characteristics as well as the professions of individuals. Several components play a role in creation of a beautiful smile including a proper smile arc, the status of buccal corridors, the golden ratio and the proportionality and symmetry of the smile components. In order to provide esthetic dental treatments, clinicians should have adequate knowledge of these principles oforofacial and dental esthetics understanding the needs of patient[1-2]However esthetic perception of dental professionals do not always match the opinion of the patients and this different view implies that more research involving laypersons would help to better understand the perception and the esthetic effects of certain smile characteristics.[3]The purpose of this study was to evaluate,analyze and compare the perceptions of smile esthetics among Indian Lay person and Prosthodontiston overall smile evaluation using the 10 commandments of smile esthetics described by Dr. Machado in 2014.[4]

II. Materials And Method

A total of 30 subjects were randomly selected.

Inclusion Criteria*:*

- Patients with no esthetic dental treatment
- Complete dentition (except3nd molars)

Exclusion Criteria:

- H/O of Orthodontic treatment
- H/O of Orthosurgical treatment
- Periodontal Disease

Photographs were obtained of the posed smiles with teeth display of these patients.The photographs were transferred to a computer and cropped by Adobe Photoshop to standardize the size in such a way that the pictures showed only the soft tissue subnasal to soft tissue pogonion area.

Fig.1. Ideal esthetic smile cropped from subnasale to pogonion region

A total of 30 pictures of smile of30 subjects taken were arranged in two series of slides using Microsoft PowerPoint 2010 software. In the first series of slides, the pictures were arranged randomly. The objective of showing the first series of pictures was to familiarize the observers with the pictures.In the second series, the pictures were arranged randomly. The objective of showing the second series was to answer the general question of the questionnaire. The observers were allowed to mention their opinions about each answer in the questionnaire. The observers consisted of 20 subjects including 10Prosthodontist and 10 laypeople. The laypeople did not have any previous knowledge about the proposed criteria for an esthetic smile. In the first series of slides (aiming to familiarize the subjects with the pictures), the time allocated for viewing each slide was 15 seconds. In the second series of slides, time was allocated to answer the questionnaire. Each subject was given a VAS chart with a 1-10 rating scale (1 indicated very bad and 10 indicated very good).

Questionnaire:

1. How would you rate this smile? (using Visual Analogue Scale chart with 1-10 rating scale i.e. 1 indicated very bad and 10 indicated very good).
2. On what aspect did you make your judgment?
   a. Teeth alignment
   b. Gingival display
   c. Amount of incisor display
   d. Smile line
   e. Buccal corridor space
3. If the score given to the smile is less than 7, what was the reason?

The difference in the judgment of professionals and laypersons was analyzed.

III. Results

Layperson considered 19 smiles out of the 30 smiles as pleasant and scored them above 7/10, whereas Prosthodontist scored 15 smiles above 7 out of the 30 smiles.Compared to that of layperson, Prosthodontist were more critical in the evaluation of tooth proportion, buccal corridor space. However, Prosthodontist and layperson similarly evaluated the irregularities in smile arc, gingival display, teeth alignment.

Table 1: Factors that affected laypersons' judgment

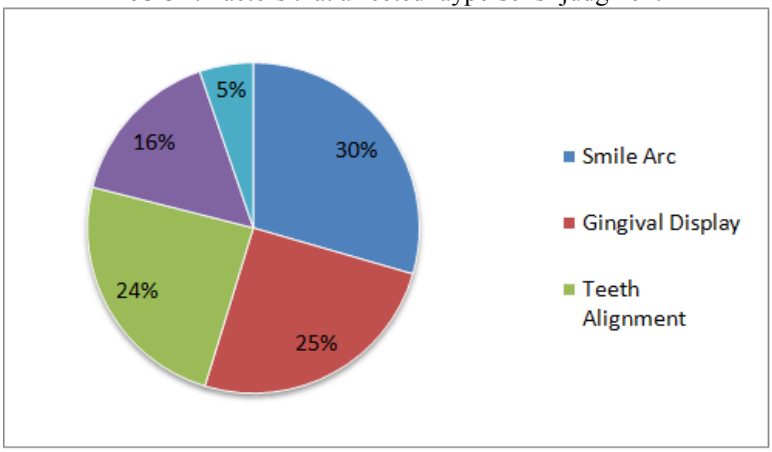

Table No.2.1: Smile Commandment

	Smile arc	Ratio and symmetry of maxillary central incisors	Proportion between anterior-superior teeth	Presence of antero superior space	Gingival design followed	Gingival exposure
Pleasant smiles (19)	Consonant -13 Straight-06	Below 75% - -02 75-85% - 17 Above 85% - 00	Followed golden proportion –06 Did not follow golden proportion-13	Midline diastema - 00 Space distal to lateral incisor- 01	All	None (greater than 2mm)
Moderately pleasant smile (11)	Consonant-06 Straight -04	Below 75% - -04 75-85% - 05 Above 85% - 02	Followed golden proportion –01 Did not follow golden proportion-10	Midline diastema - 01 Space distal to lateral incisor- 01	10	02

Table 2.2 : Smile Commandments

	Buccal corridor space	Midline and tooth angulation	Tooth colour and anatomy	Lip volume
Pleasant smiles (19)	Narrow – 5 Intermediate –13 Wide – 1	Midline deviation - 01 Change in tooth angulation – 01	Whitish in colour	Adequate
Moderately pleasant smile (11)	Narrow – 02 Intermediate –05 Wide -04	Midline deviation - 03 Change in tooth angulation – 04	Whitish in colour Peg laterals in #21	Adequate

IV. Conclusion

It was observed that Pleasant smiles followed minimum of seven out of ten commandments of smile esthetics.

V. Discussion

The current study aimed to assess to what extent dental professionals in India can rely on the esthetic judgment of laypersons since these subjects are the seekers of esthetic treatments provided by dentists. We aimed to assess and compare the esthetic perception of laypeople and professionals of the frontal smiling view of subjects and the level of agreement between them. The results of this study showed no significant difference in perception of prothodontistand laypersons of smile esthetics. Krishnan et al,[5] found no difference in the perception of specialists and laypeople of smile arc and buccal corridor measurement. Parekh et al,[6] assessed the variations in the acceptability of smile arc and buccal corridor space and reported no significant difference in the preferences of laypeople and orthodontists in this regard. These studies confirms our findings. Abu Alhaija et al, [7] revealed a significant difference in the judgment of professionals and laypeople. Such differences in the results may be due to the effect of cultural differences on esthetic perception. Esthetic perception is a subjective experience and may change based on the common beliefs and standards of a community. Facial features, such as hair color, face pattern, skin color and gender, are factors that potentially affect the level of visual attention on the smile esthetic perception by laypersons. Therefore, to avoid the bias facial photographs were cropped from subnasale to pogonion region.We focused on the factors that affected the judgement of laypersons. It was observed that laypersons could evaluate the irregularities in smile arc, gingival display, teeth alignment similar to a Prosthodontist.

Fig.2. Consonant smile arc where incisal edge followed the lowerlip line were considered more esthetic

Morearched incisal contour gave the appearance of younger looking smile while straight smile arc gave older appearance. This factor should be taken into consideration while planning esthetic restorations i.e. crowns and veneers and/or rehabilitation with complete dentures.According to the second commandment, ideal maxillary w/h ratio of pleasant smiles were in the range of 75 % - 85%.[8] It was observed values near the range of 75 % was commonly seen in women and values near the range of 80% was seen in men. Narrower teeth were considered more esthetic by layperson. During esthetic treatment, a Prosthodontist should determine whichcentral incisor follows proper W/H ratio and that should be used as template. If both are altered then height should be used as reference.

Fig 3.Smile with minimal display of gingiva

Golden proportion was described by Levin in 1928.[9] On smiling lateral incisor should be 62% width of central incisor and canine should be 62% width of lateral incisor. According to this study 13 out 19 pleasant smiles did not follow golden proportion. This was in accord with Burkhary et al study[10] which concluded that proportion of 67-70 % appeared more esthetic.Midline diastema of less than 2 mm were not observed by layperson.[11] This was confirmed in our study as Layperson was not critical in evaluation of space less than 2 mm present distal to lateral incisor in smile #16. Incisal smile design (white esthetics) is most important in smile esthetics followed by pink esthetics.[12]This was confirmed since layperson were not critical in evaluation of gingival design and gingival asymmetry of less than 2 mm were not observed by them.

Assessment of the questionnaires filled out by laypersons revealed that the reason for rating the smile in slide #2 as unattractive was due to excessive gingival display in the image. Maximum limit of gingival tissue exposure is 3mm. [11] Greater gingival exposure is considered unesthetic by layperson and Prosthodontist.

Fig.4.Excessive gingival display

Bilateral space between vestibular space of visible maxillary posterior teeth and lip commissure while smiling is buccal corridor space.[12] Lay persons lacked in knowledge of this factor and were not critical in its evalution. However, intermediate or narrow buccal corridor space were more observed in esthetic smiles[13] and preferred by Prosthodontists in our study. Midline deviation not greater than 3-4 mm are not identified by laypersons but minimal changes of 2.00mm in angulation of anterior teeth was considered unesthetic by layperson.[11] Hence while restoring smile any degree of change in tooth angulation should be corrected.

Fig.5. Tooth malalignment and crowding as observed by laypersons

Crowding or asymmetry of the teeth was easily detectable by laypeople in our study and this finding was also in accord with the results of previous studies However laypersons were not critical in evaluation of buccal corridor space, lip volume. It was observed that Laypersons had similar esthetic perception as Prosthodontistand correctly detected the reason behind an unaesthetic smile to some extent. Therefore, it appears that in esthetic dental treatments, laypeople's judgment can be relied on after all.These findings must be taken into account during anterior restoration. Prosthodontist should work together with the patient to create "front teeth" (i.e. porcelain veneers or crowns) with lengths that are appropriate for the individual, esthetically pleasing and allows the patient to function and speak properly.

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