A COMPARATIVE ANALYSIS OF SMILE PERCEPTION BETWEEN ORTHODONTISTS AND LAYPERSONS

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ABSTRACT

Assessing smile is a highly subjective matter and it can vary depending upon the social, cultural, ethical & environmental factors. Modern orthodontics has been closely associated with esthetics. Because of the subjective character of esthetic parameters, orthodontists & patients should reach a consensus to establish common treatment goals. It has been shown that dentists, mainly the orthodontists, are less tolerant than laypersons while evaluating different characteristics of smile.

The aim of this study was to evaluate the perception and preference of different smile attributes amongst orthodontists and laypersons.

31 smile photographs were given to 13 orthodontists and 13 laypersons. They were asked to rate them on attractiveness by using visual analogue scale on 6 attributes of smile mesh. SPSS 22 was used to analyze the data.

There was no significant difference in the perceptions of smile between the two groups. However laypersons mean scoring was significantly higher in few photographs. The preference for various smile attributes showed variation between the groups. Orthodontists rated smile arc while laypersons rated incisal show as the most preferred attribute.

Key Words: *smile perception; smile preference, orthodontists and laypersons.*

INTRODUCTION

Beauty is seen as a highly subjective phenomenon that results from individual factors such as gender, race, education, personal experiences and social factors such as the environment and the media.[1] Assessing patient's smile allows the clinician to see what needs to be done, what can be done and what should be accepted. Smile analysis includes assessing patient's smile arc, smile line, tooth and gingival display, presence of buccal corridor space, coincidence between facial and dental midlines, tooth proportionality, gingival esthetics and tooth color.[2] These attributes constitute the macro, micro and mini esthetics.[3] A number of studies available in the literature have focused on smile geometric and objective analysis.[4-6]

Smile esthetics has become a major concern among patients and orthodontists. It has been the main reason why patients seek orthodontic treatment.[7] Thus it holds a detailed evaluation in orthodontic diagnosis and treatment planning. Certain guidelines must be followed in treatment planning to restore or recover the smile esthetics.[8] In addition, it is also necessary to scientifically understand smile pleasantness from the point of view of laypeople and patients.[9] Identifying the problem with the smile esthetics might not be a simple task as there might be a difference in view of orthodontists and laypersons.[10]

Some studies report that orthodontists are less tolerant than laypersons when comes to evaluating the dentofacial characteristics.[11,12] Pinho, Ciriaco, Faber and Lenza[13] evaluated the impact of asymmetrical anterior teeth on the smile esthetics according to the opinions of laypersons, orthodontists and prosthodontists. The authors concluded that the orthodontists and prosthodontists were more critical than laypeople of midline deviation and changes in the gingival margin of the upper central incisors.

However in another study done by Parekh, Fields, Beck and Rosentiel[14], it was demonstrated that laypersons and orthodontists preferred a smile in which smile arc parallels the lower lip and buccal corridors are minimal. Significant lower ratings were given to flat smile arcs and over excessive buccal corridors.

In order to obtain a clinically satisfactory outcome, it is imperative one must understand, what is beautiful and attractive to the orthodontist and general dentists might not seem attractive to the patients.[15,16] Scientific studies investigating the esthetic standards of the smile

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in laypersons are therefore of paramount importance. This in turn has direct impact on success of treatment and satisfaction of the patient.[17] This study will help us understand the perception of laypersons, which often are not given the due importance in the treatment planning. Also it will help orthodontists realize that they should not impose their own perception of smile and esthetics on their patients.

METHODOLOGY

This was a cross sectional comparative study which was done to compare the micro and macro attributes of smile esthetics between the two groups i.e. orthodontists and laypersons. The data was collected randomly by a panel of specialists at department of Orthodontics, Margalla Institute of Health Sciences (MIHS). The selected individuals were said to have pleasing faces with normal facial proportions, attractive smiles, no dentofacial deformity / malocclusion and no history of orthodontic treatment. The consent was obtained from 31 selected individuals (both male and female) and their frontal smiling photographs were taken. (Fig 1) All the photographs were taken in relaxed position by a single operator with a fixed distance between the operator and the subject in true daylight. 13 orthodontists and 13 laypersons participated in the study. A smile photograph of each subject along with the visual analogue scale was given to each assessor to rate it from 0 to 100, with 0 being least attractive to 100 being most attractive. The assessors were also asked to state the reason for their rating from the following six smile attributes: smile line, smile arc, buccal corridors, incisal show, tooth and gingival color.

The smile line, smile arc, buccal corridors and incisal show constitute the mini-esthetics while tooth color and gingival color constitute the micro-esthetics. The descriptive statistics were used to determine the mean and standard deviation and analysis of variance (ANOVA) was used to compare the means. Pearson chi-square co-relation was used to co-relate different smile attributes among the two groups at 0.05% level of significance.

RESULTS

The mean scores of the photographs were evaluated and the difference was calculated by using analysis of variance (ANOVA). The p value for most of the photographs was more than 0.05 showing no significant difference between the orthodontists and laypersons. However there was significant difference for few photographs between the two groups. (P < 0.05) (Table 1)

The percentages of preference for various attributes of smile esthetics were different for both groups. Orthodontists rated smile arc as the most preferred attribute (42.78%) followed by incisal show (17.43%), tooth color (14.72%), smile line (14.20%), buccal corridor (9.68%) and gingival color (1.24%) (Fig 2). While the laypersons rated the incisal show as the most preferred attribute (40.01%) followed by tooth color (22.32%) smile line (17.97%), smile arc (12.83%), gingival color (3.59%) and buccal corridors (3.34%) (Fig 3). The percentages of attributes were co-related by using Pearson chi-square co-efficient. (Table 2) The significance level was more than 0.05 for most of the attributes. This shows a week co-relation implying

TABLE 1: ANOVA SCORES AND P VALUE FOR BOTH GROUPS AT 0.05 % LEVEL OF SIGNIFICANCE

Pic No.	Score of Orthodontists Mean (SD)	Score of LP Mean (SD)	P value
1	72.3 (17.9)	91.5 (12.6)	.004*
2	65.8 (18.9)	71.1 (16.7)	.449
3	48.4 (14.6)	45.8 (14.1)	.637
4	53.8 (15.4)	61.5 (10.9)	.155
5	55 (15.0)	68.4 (10.7)	.014
6	46.1 (15.0)	60 (14.1)	.023
7	57.3 (20.0)	64.6 (15.1)	.304
8	22.7 (12.9)	35 (15)	.034
9	25.8 (14.6)	41.5 (17.1)	.018
10	39.6 (15.1)	55.4 (19.9)	.032
11	41.7 (9.7)	57.3 (11.7)	.001*
12	56.9 (14.8)	70 (12.9)	.024
13	40.3 (17.9)	60.4 (13.8)	.008
14	54.2 (17.1)	67.7 (17.4)	.058
15	22.3 (18.1)	48.9 (21)	.002
16	34.6 (19.2)	57.3 (20.5)	.008
17	33.8 (16.6)	54.2 (15.5)	.004*
18	48.5 (11.9)	56.5 (20.9)	.239
19	26.3 (20.3)	46.1 (22.6)	.027
20	57.3 (12.5)	73.8 (10.9)	.001*
21	56.9 (9.6)	72.3 (10.8)	.001*
22	22.7 (17.3)	28.8 (17.8)	.380
23	56.9 (13.8)	66.9 (14.1)	.080
24	25.4 (14.3)	41.1 (11.9)	.005*
25	38.1 (10.7)	53.1 (12.7)	.003*
26	51.9 (16.3)	65.4 (17.5)	.053
27	45.4 (13.4)	62.7 (12.2)	.002*
28	19.6 (13.9)	35.4 (10.5)	.003*
29	57.3 (11.5)	70 (8.9)	.004*
30	42.7 (18.3)	50.8 (17.7)	.264
31	49.6 (15.2)	61.5 (15.7)	.061

TABLE 2: CO-RELATION BETWEEN THE SMILE ATTRIBUTES PREFERRED BY THE TWO GROUPS

Pic No.	Pearson Co-relation χ^2	P value at 0.05% sig.
1	5.067	0.167
2	3.866	0.276
3	5.022	0.413
4	6.667	0.155
5	3.286	0.511
6	5.067	0.408
7	5.778	0.216
8	5.867	0.209
9	12.000	0.035*
10	12.587	0.028*
11	8.467	0.037*
12	18.200	0.001*
13	6.691	0.245
14	10.055	0.018*
15	10.000	0.040*
16	16.500	0.001*
17	10.743	0.057
18	16.267	0.003*
19	6.067	0.300
20	11.200	0.024*
21	10.767	0.029*
22	4.278	0.233
23	9.511	0.023*
24	15.905	0.003*
25	15.033	0.010*
26	6.800	0.236
27	13.967	0.007*
28	5.429	0.246
29	3.886	0.422
30	3.619	0.306
31	4.533	0.339

that the preference for smile attributes was different between the two groups. However very small number of the photographs showed p value more than 0.05, this suggests strong co-relation between the attributes of those photographs.

DISCUSSION

In this study the perception of smile was same for the both groups indicating what was pleasing for orthodontist was also pleasing for laypersons. However the mean scores for all of the photographs were higher for laypersons and some of the scores were significantly higher. (p < 0.05) This shows that laypersons were less critical in their evaluation. (Table 1) This could be attributed to the highly subjective nature of training that orthodontists receive. They become more critical to perceive minor deviations in the smile esthetics. These minor problems can be easily overlooked by the laypersons because their eye is not trained to pick deviations of smaller magnitude and the standards of smile esthetics would not be as high in them as in the specialists.

Suzuki, Machado and Bittencourt[18] investigated the perception of incisal show and maxillary gingival exposure on the esthetic perception of smile amongst orthodontists, maxillofacial surgeons and laypersons. The results showed that the orthodontists gave least scores to gummy smile and laypersons gave highest scores. There was no significant difference in the perception between the orthodontists and maxillofacial surgeons.

Kokich, Kiyak and Shiparo[19] evaluated the perception of the amount of gingival exposure using smile photographs that were intentionally modified with the computer. Variations between the incisal show were introduced and different images were generated. Orthodontists, laypersons and general dentists evaluated the images. The results showed that gingival exposure up to 4mm was considered acceptable by the last two groups of individuals, but the orthodontists were more critical and considered exposure of more than 2mm to be unaesthetic.

However a study done by Barros et al.[20] showed no difference in the perception of vertical dentogingival display of smile amongst orthodontists and laypersons.

When it comes to the preference of different attributes, the study shows striking difference between the two groups. Smile arc was the most preferred attribute amongst orthodontists followed by incisor show, tooth color, smile line, buccal corridor and gingival color. (Fig 2) While the incisal show was the most preferred attribute by the laypersons followed by tooth color, smile line, smile arc, gingival color and buccal corridors. (Fig 3)

Smile arc was most preferred attribute by the orthodontists and it was 4th preferred in laypersons. The preference percentage was also significantly different (Fig 2 & 3) A study by Parekh, Fields, Beck and Rosentiel[21] compared the importance of smile arc & buccal corridor space between laypersons and orthodontists and it showed that the flat smile arc was considered more detrimental to the smile esthetics as compared to the variation in buccal corridors.

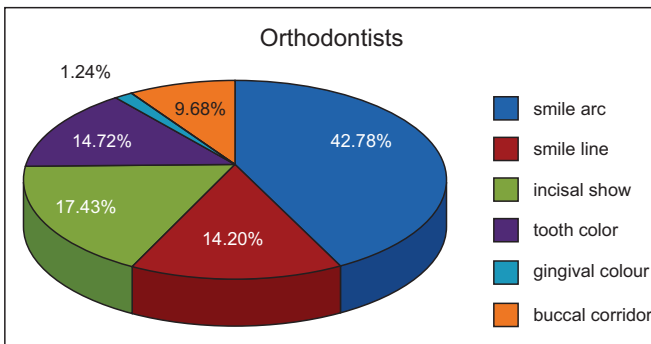Fig 1: Few of the photographs given to the two groups for assessment

Fig 2: Showing the % preference of various smile attributes for orthodontists
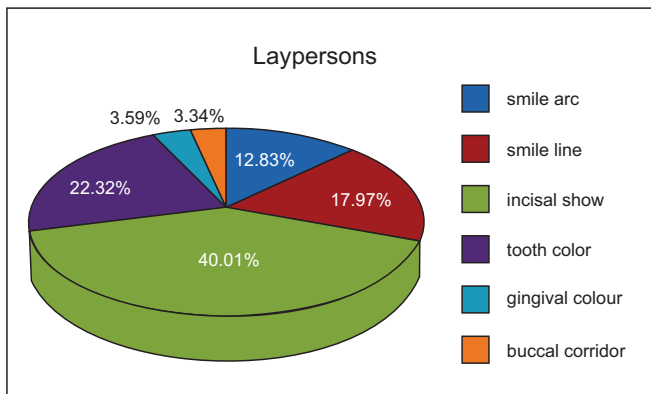

Fig 3: Showing the % preference of various smile attributes for laypersons

Incisal show was the most preferred attribute by the laypersons while it was second most preferred by the orthodontists. However there was significant difference in the percentage preference between the two groups showing week co-relation of this attribute.

Tooth color was 2nd most preferred attribute in the laypersons while it was 3rd preferred amongst orthodontists and the percentage of preference differed significantly between the two (Fig 2 & 3). A study done by Jornung and Fardal[22] showed that patients were least satisfied about their smile when the tooth color was not up to their choice. Another study by Tin-Oo, Saddki and Hassan[23] suggested that unhappiness of tooth color amongst the laypersons and patients was one of the significant reasons of negative influence on patient satisfaction with dental appearance.

The smile line was 4th preferred attribute by the orthodontists while it was 3rd preferred one by the laypersons. (Fig 2 & 3) However there was insignificant difference between the preference percentages of both the groups. A study done by Passia, Blatz and Strub[24] reported that orthodontists, general clinicians and laypersons had same perception of smile line and they rated average smile lines as most attractive.

Buccal corridor was the 5th most preferred attribute amongst orthodontists whereas it was least preferred in laypersons and the percentage preference was negligible. Roden-Johnson, Gallerano and English[25] using computer simulations of buccal corridors spaces, created absent and large buccal corridor spaces. These spaces were then rated on a visual analog scale (VAS). Orthodontists preferred normal to broad arch forms compared with untreated, narrower arch forms; whereas lay people demonstrated no preference towards any width of buccal corridors.

The results clearly indicate the subjectivity of the smile perception. The findings of this study may be the result of sub-conscious critical evaluation of smile esthetics by orthodontists. The difference between the orthodontists and laypersons insinuates a dire need to give importance to patient's opinion whilst treatment

planning. This would yield successful and satisfactory treatment outcome.

CONCLUSION

The perception of pleasing smile was same amongst the both groups. Smile arc was most preferred by orthodontists while incisal show was most preferred amongst laypersons. Patient's perception and preference should be given importance during treatment planning.

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