

PERCEPTION OF SMILE BY ORTHODONTISTS, GENERAL DENTISTS & DENTAL STUDENTS: A COMPARATIVE STUDY

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ABSTRACT

With the changing trends of modern day era and immense exposure from electronic and print media, individuals are more aware and critical of beauty standards. This has not only changed the way patients perceive and demand their dental treatment but also has produced more diversity in the perception of dental esthetics. However dental professionals (specialists, general dentists and dental students) may perceive it differently, which can cause dissatisfaction with the treatment.

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

31 smile photographs were given to 13 orthodontists, 13 general dentists and 13 dental students 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 not a significant difference between the perceptions of smile between the three groups. The preference for different smile attributes amongst the three groups showed variation. Smile arc was the most preferred attribute amongst orthodontists and dental students, while smile line was most preferred one in the general dentists.

Key Words: *smile perception; smile preference, orthodontists, general dentists, and dental students.*

INTRODUCTION

The role of esthetics in dentistry is to elevate the self-esteem of individual and how confident and beautiful they feel about themselves. The concept of esthetics as a science is strongly related to the concept of beauty, and contains a highly subjective component.¹ Most of the patients go to dental offices nowadays looking for an esthetically pleasant smile, being stimulated by the esthetic patterns suggested by the society and the media, which associate a beautiful smile to success.² Since smile is more of a perception philosophy and perception tends to differ amongst individuals.³

This has led to more deep studies in smile science and hence the concepts of macro, micro and mini esthetics came into being some years ago.⁴ An understanding of different attributes of smile esthetics is a very important step towards creating the beautiful smiles. The impact of every dental procedure should be known and carefully evaluated on the mini, macro and micro esthetics of smile. This will determine the patient satisfaction and success of dental treatment.⁵

Orthodontics is a major branch of dentistry that has huge impact on the appearance of an individual. Crowded and irregular teeth are not pleasing to look at. Orthodontic treatment is aimed towards creating socially acceptable esthetics and smiles. There has been a shift from hard to soft tissue paradigm in orthodontics.⁶ At the same time other branches of modern day dentistry also have huge impact on the appearance of an individual.⁷ General and esthetic dentists have a great role to play in this regards.⁸ Dental students are the first line of care providers in any teaching hospital. Although that care is provided under the patronage of the general dentists and specialists, but once they graduate and on their own, they will make independent decisions for their patients.⁹

The esthetic dentistry would act on the establishment of an esthetically pleasant smile, with positive and attractive characteristics.¹⁰ For that goal to be successfully achieved, the dentists must recognize the esthetic issues of the dental treatment.¹¹ Professional opinions regarding evaluation of facial aesthetics may not coincide with the perception and expectations of patients, general dentists and dental students. Defining these attributes and prioritizing them within and amongst dentists and specialists allows predictable utilization in defining perception and subsequently providing patients with realistic goals and objectives.¹²

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Received for Publication: May 21, 2015
Approved: June 2, 2015

Also, the specialists, general dentists and dental students should have common perception of esthetics for ideal and uniform treatment provision, especially in multidisciplinary approaches.¹³

This study was aimed to know about the perception of beautiful smile amongst orthodontists, general dentists and dental students, and to assess the most preferred smile attribute of mini and macro esthetics by these groups.

METHODOLOGY

It was a cross sectional comparative study. The data collected randomly at the Department of Orthodontics, Margalla Institute of Health Sciences (MIHS). A panel of specialists and general dentists selected all the subjects in the sample. 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 13 orthodontists, 13 general dentists (GD) and 13 dental undergraduate final year students (DS) participated in the study. A questionnaire with the smile photographs (Fig 1) of each subject along with the visual analogue scale (Fig 2) 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 of smile mesh while tooth color and gingival color constitute the micro-esthetics of smile mesh. The descriptive statistics were used to determine the mean and standard deviation and analysis of variance (ANOVA) was used to determine whether any significant difference existed between the mean scores of each photograph by all the assessors. To determine which specific group differed from each other, post hoc tukey test was used to determine the significance at level of $P < 0.05$, $P < 0.01$, $P < 0.001$ compared to orthodontists. Pearson chi-square co-relation was used to co-relate different smile attributes among the three groups.

RESULTS

The results of the study evaluated the perception and preference of the smile esthetics between the three groups. The results of ANOVA implied most of the p values were > 0.05 , showing there was no significant difference between scoring in three groups. This shows

that what was pleasing for orthodontists were also pleasing for other two groups as well. However some pictures showed the significant difference amongst the scores ($p < 0.05$). The post hoc tukey test was used to further confirm where the difference occurred between the three groups at different levels of P value compared to orthodontists. (Table 1)

The calculations of percentage preference for various smile attributes of smile esthetics for different groups showed difference. 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 3).

The general dentists showed different preference. Smile line was the most preferred attribute (25.73%) followed by smile arc (22.93%), incisal show (22.31%), tooth color (19.88%), buccal corridor (7.97%) and gingival color (1.26%) (Fig 4).

The dental students were similar to orthodontists in rating smile arc as the most preferred attribute, but the percentage of preference was more than those of orthodontists. Also the preference for rest of the attributes was different. Smile arc (53.59%), followed by smile line (18.63%), incisal show (15.15%), buccal corridor (5.71%), tooth color (3.97%) and gingival color (2.98%) (Fig 5). The percentage preferences were co-related by using Pearson chi-square co-efficient. The significance level was more than 0.05 for most of the attributes in the pictures. This shows a weak co-relation amongst the groups, however very small number of the pictures showed strong co-relation between the attributes (Table 2).

DISCUSSION

Many studies done in the literature showed that there exists some kind of difference of perception between the different specialists.^{14,15} Also there exists the difference between the specialists and general dentists.¹⁶

In this study there was no difference in the perception of attractive or unattractive smile. Generally what was pleasing for the orthodontists was also attractive for the general dentists and dental students. The comparison of the means with reference to the orthodontists at different p values ($P < 0.05$, $P < 0.01$, $P < 0.001$) showed there were significantly higher mean scores for very few of the pictures by the dental students and general dentists when compared to orthodontists. In a study done by Krishnan et al¹⁷ there was no perception difference found between the different specialists and laypersons. However Kokich et al showed that orthodontists are more critical to the smile evaluation and detecting the minute discrepancies.¹⁸



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

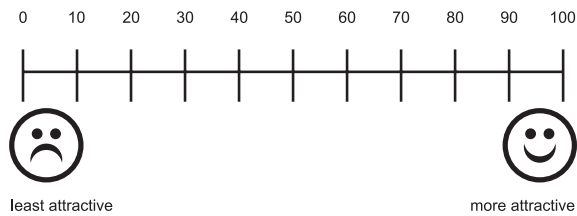


Fig 2: Visual analogue scale (VAS) for assessing the photographs

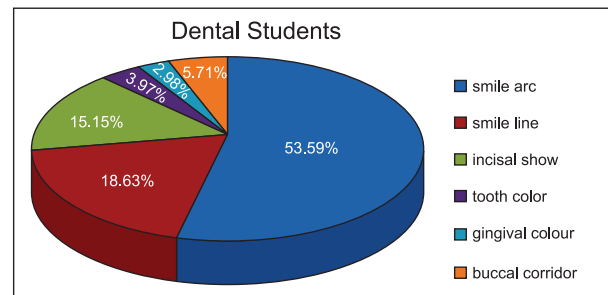


Fig 5: Showing the % preference of various smile attributes for dental students

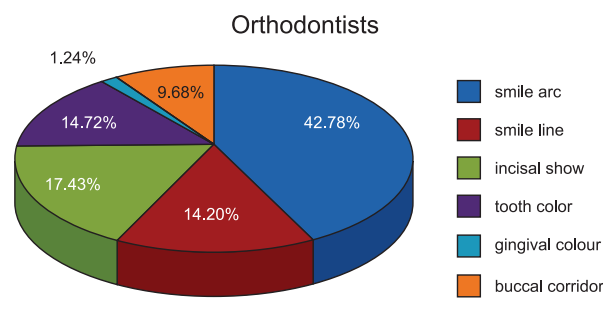


Fig 3: Showing the % preference of various smile attributes for orthodontists

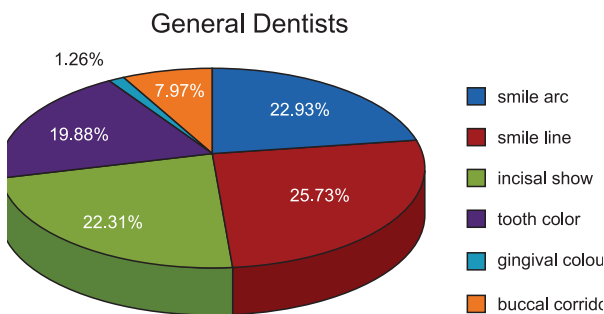


Fig 4: Showing the % preference of various smile attributes for general dentists

The preference of different attributes of mini and macro esthetics was different between the groups. The smile arc was most preferred attribute amongst the orthodontists followed by incisor show, tooth color, smile line, buccal corridor and gingival color. General dentist rated smile line as most preferred, followed by smile arc, incisal show, tooth color, buccal corridors and gingival color. Although dental students also rated smile arc as the most preferred attribute, followed by smile line, incisal show, buccal corridors, tooth color and gingival color, the percentage preference was different from that of orthodontists and students. Incisal show was preferred more with the dentists than orthodontists and students. The orthodontists and dentists preferred the tooth color, although it wasn't given preference by students. Buccal corridor was rated as the 5th preferred attribute, showing that it is not a very preferred attribute to rate the attractiveness of the smile. Study done by Dustin and Ronald also showed the presence of buccal corridors does not influence the smile esthetics.¹⁹ However the study done by Parakesh and Fields²⁰ showed that orthodontists rated smiles as less attractive with excessive buccal corridors. The gingival color was

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

Pic No.	Score of Orthodontists Mean (SD)	Score of GD Mean (SD)	Score of DS Mean (SD)
1	72.3 (17.9)	75(15.0)*	96.5 (17.5)***
2	65.8 (18.9)	54.2 (17.0)**	79.1 (16.9)
3	48.4 (14.6)	46.5(15.2)***	69.2 (8.4)*
4	53.8 (15.4)	54.2 (12.7)	62.3 (8.6)
5	55 (15.0)	66.9 (15.5)	72.1 (16.8)*
6	46.1 (15.0)	46.9 (15.0)*	63.9 (20.6)*
7	57.3 (20.0)	55 (18.5)	61.1 (15.3)
8	22.7 (12.9)	27.3 (21.1)	31.5 (16.5)
9	25.8 (14.6)	31.9 (17.9)	38.9 (15.5)
10	39.6 (15.1)	46.5 (22.1)	55.6 (22.7)
11	41.7(9.7)	47.7 (18.7)	50.9 (24.8)
12	56.9 (14.8)	53.9 (23.9)	60.3 (22.6)
13	40.3 (17.9)	44.2 (19.8)	60.0 (21.6)*
14	54.2 (17.1)	56.4 (21.9)	63.4 (18.7)
15	22.3 (18.1)	36.9 (26.1)	33.0 (17.3)
16	34.6 (19.2)	51.9 (21.9)	63.7 916.6)*
17	33.8 (16.6)	38.8 (20.2)	52.4 (15.3)*
18	48.5 (11.9)	53.1 (21.9)*	69.9 (13.9)*
19	26.3 (20.3)	34.2 (20.6)	33.5 (19.3)
20	57.3 (12.5)	51.5 (21.7)	61.5 (22.1)
21	56.9 (9.6)	56.1 (21.5)	68.7 (28.7)
22	22.7 (17.3)	28.1 (20.5)	34.9 (22.9)
23	56.9 (13.8)	55.4 (17.0)	70.5 (25.6)
24	25.4 (14.3)	38.5 (15.7)	47.7 (22.3)*
25	38.1 (10.7)	35.8 (19.3)	47.1 (18.4)
26	51.9 (16.3)	50.8 (20.6)	63.8 (24.8)
27	45.4 (13.4)	50.0 (18.7)	57.1 (22.6)
28	19.6 (13.9)	28.5 (14.0)	42.6 (14.6)*
29	57.3 (11.5)	51.5 (20.0)*	70.5 (21.7)
30	42.7 (18.3)	34.6 (20.8)	50.5 (22.5)
31	49.6 (15.2)	51.5 (19.4)	56.6 (20.9)

Results are expressed as mean at *P<0.05, ***P<0.01, ****P<0.001 compared to orthodontists

least rated attribute amongst all the groups. The weak Pearson co-relation between these groups indicates these differences. There was no significant co-relation amongst the various smile attributes between the three groups.

With the latest trends in esthetic dentistry and increasing awareness of general public, the demands of dental patients are very high; also they are more aware of different treatment options available to them.²¹ The

orthodontists and dentists being the prime care provider in this regard and the students being the future pillars of oral care provision, it is imperative to have a common perception of smile and its various attributes, specially when treating the multi-disciplinary cases. The studies have shown how smile esthetic has become the most sought after feature of almost all forms of dental specialties. The knowledge of smile esthetic should be thorough and uniform when treating the dental patients.^{22,23}

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

Pic No.	Pearson chi square Co-relation	P value at 0.05% sig.
1	12.75	.121
2	11.60	.170
3	6.94	.731
4	11.69	.306
5	7.37	.497
6	18.04	.054
7	6.14	.632
8	15.42	.051
9	10.68	.383
10	17.25	.069
11	10.88	.208
12	9.55	.298
13	9.77	.460
14	12.73	.121
15	20.17	.010*
16	14.59	.068
17	8.75	.363
18	13.40	.202
19	10.80	.213
20	25.46	.005*
21	11.17	.344
22	7.87	.446
23	10.31	.112
24	12.60	.126
25	18.22	.020*
26	13.88	.085
27	16.50	.036*
28	14.50	.070
29	7.16	.519
30	19.21	.014*
31	9.13	.519

CONCLUSION

The beauty standards were uniform amongst the three groups. While the preference of esthetics differed amongst three groups. Smile analysis should be an integral part of not only orthodontic treatment planning but of all the disciplines of dentistry. Dental Students should have a special emphasis on the smile esthetics

in their curriculum. More studies needs to be done to evaluate the perceptions in this part of the world, as most of the work done is in west.

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