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ORIGINAL ARTICLE

Smile Preferences of Orthodontists and Patients from Frontal View about Gingival Display, Occlusal Cant and Smile ARC: A Study from Isra Dental College

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ABSTRACT

Objective: Was to determine preferences of orthodontists and patients about gingival display, occlusal cant and smile arc.

Material and methods: This descriptive cross sectional study was conducted on 65 participants (15 orthodontists and 50 patients). The inclusion criteria were participants who gave consent, Pakistani nationals, age from 20 to 45 years, and Layperson/patients. Exclusion criteria were mentally retarded, uncooperative, color blinded individual and dental students, dental attendants and technicians. Adobe photoshop CS6 was used to alter the smile arc, occlusal plane and gingival display incrementally. Student t test was run to compare the smile preferences between orthodontists and patients. P≤0.05 was considered significant.

Results: The mean age of the participants was 33.15±6.29 years. Females (n=38, 58.5%) were more than males (n=27, 41.5%). For 0mm gingival show the score assigned by laypersons (6.86±0. 756) was statistically higher than orthodontists (6.40±0.507) (P=.031). Gingival show of 5mm was less acceptable to laypersons (1.92±0.752) than orthodontists (3.27±0.594) statistically (P<0.001). Ideal smile arc was attractive for both laypersons (8.04±0.638) and orthodontists (9.33±0.724) but statistically more among orthodontists (P<0.001). Significant difference was found between perception of orthodontists and laypersons for normal smile (P=.034) and canted smile (P<0.001).

Conclusion: Significant differences exist between opinions of orthodontists and laypersons in evaluating gingival display, smile arc and occlusal cant. Patient should be participated in treatment planning involving alteration of these smile parameters.

Keywords: Smile perception, gingival show, smile arc, occlusal cant

INTRODUCTION

A fundamental role in facial beauty is played by a beautiful smile and this is the commonest reason for seeking orthodontic treatment among patients.[1] The esthetics word has been derived from a Greek word `esthesis` which means perception.[2] Each individual has their own parameter for definition of beauty.[3] Due to advances in dentistry the prevalence of tooth decay has been reduced but at the same time esthetic demand among patients has been increased. To provide esthetic dental care to the patients, the clinicians must possess proper knowledge for orofacial and dental esthetics.[4] The subjectivity is very common in perceiving smile esthetics and factors like social, environmental and personal experience can affect it.[5] The definition of beauty can affected by culture and ethnicity too.[6] The perception of esthetics of anterior teeth is much more important than posterior teeth.[7]

Literature has shown that the perception for smile esthetics of dental professionals is different from general population.[8] Orthodontists are more critical in appreciating smile esthetics than other dental professionals. This difference in perception can be due to training of orthodontists in area of smile esthetics.[5]

Smile arc and gingival display have key role in smile preferences.[9] Literature showed that ideal smile arc is the consonant smile arc, in which maxillary anterior teeth follow the lower lip curvature.[10] The ideal gingival display should be zero but in females upto 2mm gingival show is considered youthful.[11] Previous studies reported that differences exist between the perception of orthodontists and patients about gingival display and smile arch.[9-11]

This is lack of local research on perception of orthodontists and patients. Ultimately it is the patient who should be satisfied from orthodontic treatment. So in this study we want to know whether there is difference in perception of orthodontists and patients about gingival show and smile arc or not. This study will help in treatment planning while changing these parameters according to the patient's preferences.

The objective of this study was to determine preferences of orthodontists and patients about gingival display, occlusal cant and smile arc.

MATERIAL AND METHODS

This descriptive cross sectional study was conducted on 65 participants (15 orthodontists and 50 patients) at Isra Dental College (Hyderabad, Pakistan). The orthodontists were having at least more than two post graduate training in orthodontists. The patients were those who come for orthodontic treatment but not yet started. The patients were selected by non-probability consecutive technique. Ethical approval letter was obtained from hospital ethical review committee.

The inclusion criteria were participants who gave consent, Pakistani nationals assessed on the basis of NIC, age 20 to 45 years, and layperson/patients consisted of people working in different professions unrelated to dentistry. Exclusion criteria were mentally retarded, uncooperative, color blinded individual and dental students, dental attendants and technicians.

Each rater (orthodontist or patient) was given explanation about the study. A female color photo with aligned teeth and consonant smile arc was selected. Adobe photoshop CS6 (USA inc.) was used to alter the smile arc, occlusal cant and gingival display incrementally. Three images were created for smile arc by adobe photoshop one was ideal smile second was flat smile arc and third was with reverse smile arc. Two images were created by adobe photoshop one was for normal occlusal plane and other was for canted. Five images were created for gingival display (a) 0mm show (b) 1 mm show (c) 3 mm shows and (d) 5 mm show.

All images were of equal size (4 by 6 inches). Each photo was shown to each evaluator separately. Evaluators were not permit to make comparison among images. Each photo was shown for 1 minute only.

Age and gender of the participants were recorded. Preferences of the smile was recorded by using a 7 point Lickert scale with 1 indicating extremely unattractive and 7 indicating extremely attractive.

Data were analyzed using SPSS 22. Mean and SD were calculated for continuous data like age and Lickert score and percentages for qualitative data. Student t test was run to compare the smile preferences between orthodontists and patients. P≤0.05 was considered significant.

RESULTS

The mean age of the participants was 33.15±6.29 years with range from 20 to 45 years. Among the participants 15(23.1%) were orthodontists and 50(76.9%) were laypersons/patients. Females (n=38, 58.5%) were more than males (n=27, 41.5%). The most common age group was 31 to 40 years (n=32, 49.2%) followed by 20-30 years (n=25, 38.5%). (Table 1)

The highest score was assigned to 1mm gingival show by orthodontist (7.27±0.594) followed layperson for 0mm gingival show (6.86±0. 756). The least attractive was (least score) for 5mm gingival show by laypersons (1.92±0.752) and orthodontists (3.27±0.594). For 0mm gingival show the score assigned by laypersons (6.86±0. 756) was statistically higher than orthodontists (6.40±0.507) (P=.031). Gingival show of 5mm was less acceptable to layperson (1.92±0.752) than orthodontist (3.27±0.594) statistically (P<0.001). (Table 2)

Ideal smile arc was attractive for both laypersons (8.04±0.638) and orthodontists (9.33±0.724) but statistically more among orthodontists (P<0.001). Least score was assigned to reverse smile arc by both orthodontists (1.33±1.345) and layperson (2.04±0.638). There was no statistically significant difference among the two raters for flat smile arc (P=.135) and reverse smile arc (P=.067). (Table 3)

Significant difference was found between perception of orthodontists and laypersons for normal smile (P=.034) and canted smile (P<0.001). The details are given in Table 4.

Table 1: Frequency of rater, gender and age group

		Frequency	Percent
Rater	Orthodontist	15	23.1
	Layperson	50	76.9
Gender	Male	27	41.5
	Female	38	58.5
Age group (years)	20-30	25	38.5
	31-40	32	49.2
	41 & above	8	12.3

Table 2: Comparison of perception of gingival show between orthodontist and layperson

Rater		Mean ± SD	95 % CI	P-Value*
Gingival show 0mm	Orthodontist	6.40±0.507	-.877, -.043	.031
	Layperson	6.86±0. 756		
Gingival show 1mm	Orthodontist	7.27±0.594	-.035, .769	.073
	Layperson	6.9±0.707		
Gingival show 3mm	Orthodontist	5.27±0.594	-.035, .759	.053
	Layperson	4.9±0.707		
Gingival show 5mm	Orthodontist	3.27±0.594	.923, 1.770	<0.001
	Layperson	1.92±0.752		

*Independent t test

Table 3: Comparison of perception of smile arc between orthodontist and layperson

Rater		Mean ± SD	95 % CI	P-Value*
Ideal Smile arc	Orthodontist	9.33±0.724	.906, 1.680	<0.001
	Layperson	8.04±0.638		
Flat Smile arc	Orthodontist	4.33±0.724	-.094 .680	.135
	Layperson	4.04±0.638		
Reverse Smile arc	Orthodontist	1.33±1.345	-1.205 -.208	.067
	Layperson	2.04±0.638		

*Independent t test

Table 4: Comparison of perception of occlusal cant between orthodontist and layperson

Rater		Mean ± SD	95 % CI	P-Value*
Canted OP	Orthodontist	1.0±0.845	-1.23, -.049	.034
	Layperson	1.64±1.045		
Normal OP	Orthodontist	9.4±0.632	.739, 1.54	<0.001
	Layperson	8.26±0.694		

DISCUSSION

This study was conducted to know the perception of orthodontists and laypersons about three variables for frontal smile i.e. gingival display, smile cant and smile arc. Our main findings showed that for orthodontists most attractive gingival display was 1mm and for layperson it was 0mm gingival show. Laypersons preferred less gingival show than orthodontists statistically. Both patients and orthodontists preferred consonant smile arc and not accepted flat and reverse smile arc. However significant difference was found in assigning score for ideal smile arc between orthodontists and patients. Significant difference was found between perception of orthodontists and layperson for canted smile and normal smile.

Perception can be different among patients and orthodontists. While carrying out tooth movement to change smile it is of paramount importance to incorporate patient's perception about smile.[12] Gingival show is amount of gum display when a subject makes pose smile. According to new literature upto 2mm gingival show is considered youthful for females.[13] But our results showed that no gingival show is preferred by patients. Similar results have been reported in previous studies that difference in perception exists between orthodontists and layperson about gingival display.[14-16]

Consonant smile arc in while upper incisal edges follow lower lip curvature can increase smile attractiveness. On other hand flat smile arc reduce smile attractiveness significantly.[9, 12, 17] But few studies found that consonant smile arc is not essential entity of a pleasant smile.[18] Our results showed that significant difference exist in perception of orthodontists and laypersons for smile arc. Similar results were documented in previous study.[19] Another study conducted by Kaya et l.[16] also reported that perception about smile arc is statistically different between orthodontists and laypersons.

Cant in occlusal plane and smile adversely affect the attractiveness of smile.[16] Our findings revealed that significant difference was found between perception of orthodontists and layperson for normal smile (P=.034) and canted smile (P<0.001). Orthodontists assigned lesser scores to the canted smile than laypersons. This can be due to their more cognitive awareness about smile because of high knowledge about basic smile parameters. Similar findings were also reported in previous literature.[9, 20]

CONCLUSION

Significant differences exist between perception of orthodontists and laypersons in evaluating gingival display, smile arc and occlusal cant. Patient should be participated in treatment planning involving alteration of these smile parameters.

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