



Prosthodontics

PERCEPTION OF SMILE ATTRACTIVENESS AMONG PROSTHODONTISTS, UNDERGRADUATE STUDENTS, AND POSTGRADUATE STUDENTS IN SUBURBAN CHENNAI: A QUESTIONNAIRE SURVEY

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ABSTRACT **Background:** Smile aesthetics is an important component of facial attractiveness and plays a major role in social interaction and psychological well-being. **Aim:** To evaluate and compare the perception of smile attractiveness among prosthodontists, undergraduate students, and postgraduate dental students. **Materials and Methods:** A cross-sectional questionnaire-based study was conducted using standardized clinical photographs and a Dental Appearance Questionnaire (DAQ). A total of 50 patients participated in the study. **Results:** post graduates had greater knowledge than under graduates or general practitioner which was statistically significant demographic variances and total perception scores regarding smile designing procedures shows $P < 0.0001$. All other related questions post graduates had better knowledge than general practitioner and under graduate. **Conclusion:** In this study smile photographs were given in the questionnaire to evaluate the smile with grading: very high, high, medium, low, very low. Most of the dental professionals were pursuing post graduates were able to evaluate the perception of smile better than Under graduate.

KEYWORDS :

INTRODUCTION

A pleasant smile is widely regarded as an essential component of facial beauty and interpersonal communication. In modern dentistry, increasing emphasis has been placed on achieving optimal dental esthetics as patients seek treatments that improve both function and appearance. Understanding how different groups perceive smile aesthetics is important because successful esthetic dental treatment depends not only on clinical guidelines but also on patient expectations and perceptions. Therefore, the present study was designed to compare the perception of smile attractiveness among prosthodontists, undergraduate students, and postgraduate dental students in suburban Chennai and to identify the smile design characteristics that are considered most aesthetically pleasing or displeasing.

Aim and Objectives

Aim:

To compare the perception of smile attractiveness among prosthodontists, undergraduate students, and postgraduate students in suburban Chennai.

Objectives:

- To evaluate the perception of dental appearance using standardized photographs. To assess the influence of professional education on the evaluation of smile aesthetics
- To identify the esthetic parameters that are most positively and negatively perceived
- To compare the evaluation patterns among prosthodontists, undergraduate students, and postgraduate students.

MATERIALS AND METHODS

Study Design:

A cross-sectional questionnaire-based study was conducted to evaluate smile attractiveness perception. The study included three evaluator groups: Prosthodontists, Postgraduate dental students, Undergraduate dental students. A total of 50 patients participated in the study and completed a Dental Appearance Questionnaire (DAQ). All evaluators were asked to assess the photographs independently. A visual linear rating scale ranging from 0 to 10 was evaluated.

Two photographs were taken for each; a social smile and an intra-oral frontal photograph of the teeth in the occlusion position. Except for gingival exposure, all other smile characteristics remained unchanged. Other confounders as chin and nose were trimmed.

Data Analysis

Sample size was calculated in G*power with α set as 0.05 and power of 95%.) to be at least 122 participants.. Descriptive statistics were used to summarize the data, and data were tested for normality in distribution using the Kolmogorov-Smirnov test. The Mann-Whitney test was used to test the statistical significance between the different levels of gingival exposure within the study groups. The Wilcoxon signed-rank test was used to compare male and female raters' assessment of photos of both smiles. Student's t-test was used to determine statistical differences between the study groups. Statistical significance was set at $p < 0.05$.

RESULTS

A questionnaire study was designed to evaluate smile perception among under graduate, post graduate and general dental profession with experience from one to five years greater. Questionnaire was modified and adapted from. Total of 125 participants (68 male and 67 female) answered. In the overall demographics all participants had under graduate dental educational background. For comparison post-hoc comparison and kruskal-wallis test was done with SPSS software. The questionnaire evaluated the knowledge of smile designing procedures in which post graduates had greater knowledge than under graduates or general practitioner which was statistically significant demographic variances and total perception scores regarding smile designing procedures sho $P < 0.0001$. All other related questions post graduates had better knowledge than general practitioner and under graduate. Spearman correlation analysis was done to find the differences in wed no statistical significant.

Post-HOC pairwise comparison of total perception showed that professionals having greater than 5 years of experience had greater knowledge and the result were statistically significant $P > 0.001$.

t tests - Means: Difference between two independent means (two groups)

Analysis: A priori: Compute required sample size

Input: Tail(s) = One
Effect size d = 0.6
 α err prob = 0.05
Power (1- β err prob) = 0.95
Allocation ratio N2/N1 = 1

Output: Noncentrality parameter δ = 3.3136083
Critical t = 1.6576509
Df = 120
Sample size group 1 = 61
Sample size group 2 = 61
Total sample size = 125

Reliability Analysis of the Perception and Knowledge Questionnaire Using Cronbach's Alpha

Parameter	Value
Cronbach's alpha	0.919
Number of items	12

Table 1: Demographic Characteristics of the Study Participants

Demographic data	Frequency (n)	Percentage (%)
Age (Mean $\pm$ SD)	25.44 $\pm$ 3.67	
Gender		
Male	68	50.4
Female	67	49.6
Designation		
Undergraduate students (UG)	45	33.3
Prosthodontist(P)	45	33.3
Postgraduates (PG)	45	33.3
Professional		
Student	36	26.7
Academics	21	15.6
Practice	35	25.9
Both	43	31.9
Experience		
No experience	44	32.6
1-2 years of experiences	30	22.2
3-5 years of experiences	41	30.4
>5 years of experiences	20	14.8

SD- Standard deviation

Table 2: Comparison of Perception and Knowledge of Smile Design Procedure Among Designated Participant Groups

Questions	Mean Rank			H value	df	p-value
	UG	P	PG			
Q1	52.90	75.40	75.70	11.175	2	0.004**
Q2	59.89	69.99	74.22	3.450	2	0.178
Q3	57.26	74.78	71.90	5.558	2	0.062
Q4	57.07	71.22	75.82	6.184	2	0.045*
Q5	59.33	76.41	68.07	4.623	2	0.099
Q6	48.42	77.28	78.32	19.516	2	<0.001***
Q7	63.22	75.49	65.06	2.979	2	0.226
Q8	64.87	78.66	60.06	6.141	2	0.046*
Q9	66.28	70.76	68.88	0.384	2	0.825
Q10	55.19	73.93	74.90	8.056	2	0.018*
Q11	75.91	67.97	59.94	4.292	2	0.117
Q12	61.74	77.62	64.34	4.680	2	0.096

UG – Undergraduate students; P- Prosthodontist; PG – Postgraduates; df- degree of freedom

Kruskal-Wallis test; *p < 0.05 is considered as statistically significant; **p < 0.01 is considered as statistically significant; ***p < 0.001 is considered as highly statistically significant

Table 3: Post-hoc Pairwise Comparison of Perception and Knowledge of Smile Design Procedure Among Designated Participant Groups

Questions	Comparison	Mann-Whitney U	Z	p-value
Q1	UG - P	705.00	-2.707	0.007**
	P- PG	640.50	-3.224	0.001**
	UG - PG	1001.50	-0.089	0.929
Q4	UG - P	840.00	-1.609	0.108
	UG - PG	693.00	-2.627	0.009**
	P- PG	965.00	-0.399	0.690

Q6	UG - P	611.00	-3.619	<0.001***
	UG - PG	533.00	-4.156	<0.001***
	P- PG	1009.00	-0.026	0.980
Q8	UG - P	812.50	-1.873	0.061
	UG - PG	908.50	-0.719	0.472
	P- PG	744.00	-2.292	0.022*
Q10	UG - P	752.50	-2.358	0.018*
	UG - PG	696.00	-2.527	0.012**
	P- PG	1002.50	-0.085	0.932

UG – Undergraduate students; P-Prosthodontist; PG – Postgraduates

Mann Whitney U test; *p < 0.05 is considered as statistically significant; **p < 0.01 is considered as statistically significant; ***p < 0.001 is considered as highly statistically significant

Table 4: Comparison of Total Perception and Knowledge of Smile Design Procedure Among Different Study Participant Groups

Variables	Groups	N	Mean Rank	H value	df	p-value
Designation	UG	45	61.80	4.255	2	0.119
	P	45	77.52			
	PG	45	64.39			
Professionals	Student	36	50.72	17.626	3	<0.001***
	Academics	21	53.26			
	Practice	35	82.43			
	Both	43	77.92			
Years of experience	No experience	44	44.41	21.748	3	<0.001***
	1-2 years	30	77.57			
	3-5 years	41	73.02			
	>5 years	20	82.67			

N – Number of participants; df- degree of freedom; UG – Undergraduate students; P-Prosthodontist; PG – Postgraduates

Kruskal-Wallis test; *p < 0.05 is considered as statistically significant; **p < 0.01 is considered as statistically significant; ***p < 0.001 is considered as highly statistically significant

Table 5: Post-hoc Pairwise Comparison of Total Perception and Knowledge of Smile Design Procedure According to Professional Status and Years of Experience

Variables	Comparison	Mann-Whitney U	Z	p-value
Professional	Student vs Academics	290.00	-1.468	0.142
	Student vs Practice	375.00	-2.945	0.003**
	Student vs Both	495.00	-2.762	0.006**
	Academics vs Practice	150.00	-3.712	<0.001***
	Academics vs Both	271.50	-2.597	0.009**
	Practice vs Both	720.00	-0.328	0.743
Years of experience	No vs 1-2 years of experiences	313.50	-3.833	<0.001***
	No vs 3-5 years of experiences	530.50	-3.283	<0.001***
	No vs >5 years of experience	120.00	-3.676	<0.001***
	1-2 vs 3-5 years of experience	607.00	-0.094	0.925
	1-2 vs >5 years of experience	908.50	-0.719	0.472
	3-5 vs >5 years of experience	252.50	-1.023	0.306

Mann Whitney U test; *p < 0.05 is considered as statistically significant; **p < 0.01 is considered as statistically significant; ***p < 0.001 is considered as highly statistically significant

Table 6: Spearman's Correlation Analysis Between Demographic Variables and Total Perception Scores Regarding Smile Design Procedures

	Gen der	Age	Designation	Pro- fessional	Experi- ence	Total percep- tion
Gender	1	0.310**	0.327***	0.359***	0.343***	-0.113
Age		1	0.642***	0.635***	0.756***	0.020
Designation			1	0.612***	0.437***	0.016
Professional				1	0.798***	0.307***

Experience					1	0.222**
Total perception						1

Spearman's rho correlation test; *p < 0.05 is considered as statistically significant; **p < 0.01 is considered as statistically significant; ***p < 0.001 is considered as highly statistically significant

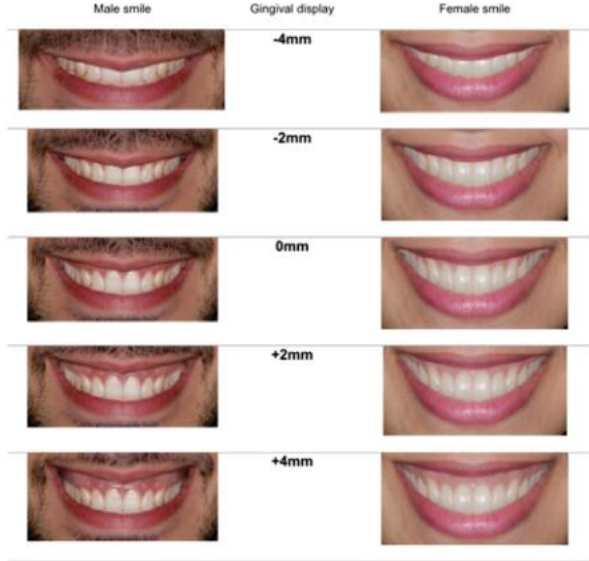


Figure 1. Some of the altered smiles with gingival display; - 4 mm, - 2 mm, 0 mm, + 2 mm, and + 4 mm that in actual questionnaire, photos shown were incrementally 1 mm increasing by manipulating the

Figure2: Box Plot Depicting the Distribution of Total Perception Scores According to Designation

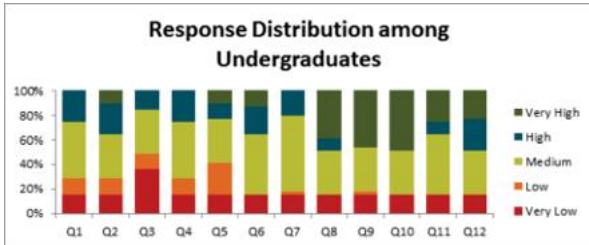


Figure 3: Bar Chart Illustrating the Response Distribution of Perception and Knowledge Questionnaire Items Among Prosthodontist

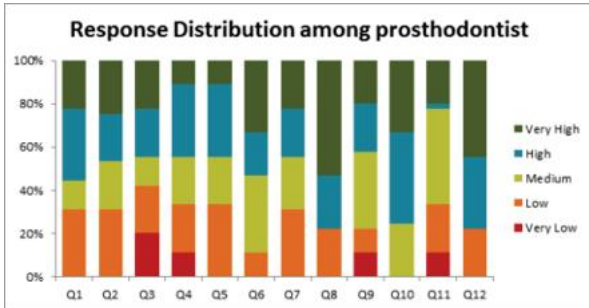


Figure 4: Bar Chart Illustrating the Response Distribution of Perception and Knowledge Questionnaire Items Among Postgraduate Students

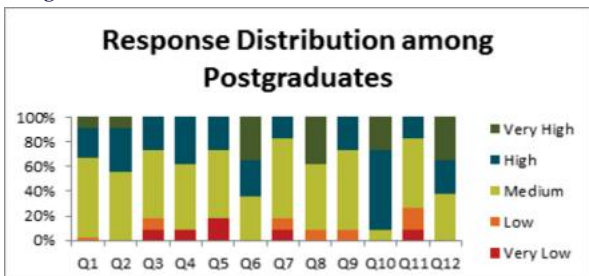


Figure 5: Bar Chart Illustrating the Response Distribution of Perception and Knowledge Questionnaire Items Am

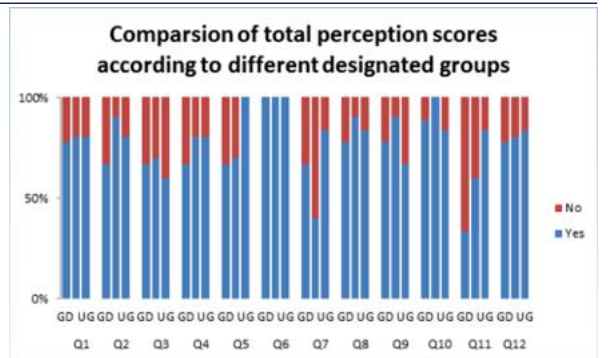


Figure 6: Bar Chart Illustrating the Comparison Of Response Distribution Among Designated Participant Groups for Perception and Knowledge Regarding Smile Design Procedure

DISCUSSION

The esthetics of a smile is an important determine factor in the perception of an individuals appearance and personalities.(1)sausen. The assessment of the perceive smile is of atmost important in the treatment planning. (1)sausen. Many studies have investigated the perceptions of smile by general dental professions, laypersons, orthodontist and prosthodontist .In this study the comparison of smile perceptions was done by dental professions, under graduates, prosthodontist and postgraduates in prosthodontist.

In this study smile photographs were given in the questionnaire to evaluate the smile with grading : very high, high, medium, low, very low. Most of the dental professionals were pursuing post graduates were able to evaluate the perception of smile better than Under graduate.

This findings is consistent with the results of geevargheseetal(2), khalaf et al(3)and kokich et al(3)who reported that dentists possess a high ability to detect the most subtle changes in smile esthetics compared to the general population. The findings of the study indicates that smile perception was better in general practitioners and post graduates compared to under graduate students. This may be due to the greater exposure of clinical patients and their theoretical knowledge especially in post graduates students. The software knowledge to smile design also was greater in post graduates than the other groups .The limitations of the study includes that it was an objective questionnaire study with limited number of participants. Larger number of professionals need to be questioned for a final conclusion on smile perception and knowledge regarding smile design.

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