



# KNOWLEDGE, ATTITUDE, PRACTICE ABOUT SMILE DESIGNING AMONG DENTAL PROFESSIONALS - A QUESTIONNAIRE STUDY

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## ABSTRACT:

### Introduction :

In modern dentistry, it is no longer acceptable to restore only individual teeth. A growing number of patients are demanding a final appearance that is not only physiologically and mechanically sound, but is also aesthetically pleasing. Dentists should develop a treatment plan that is not only healthy for the tooth tissue, but also aesthetically pleasing.

The aim of this questionnaire study was to access knowledge, attitude and practice about the overall smile designing procedures.

### Materials and Methods:

A questionnaire study was conducted among the dental professionals i.e BDS and MDS dentists in order to access the knowledge, attitude and practice about smile designing. The structured, self administered and close ended questionnaire was designed to assess the knowledge about smile designing which consisted of 4 parts and 33 questions related to the topic. Questionnaire validity (Aiken's V) was found to be 0.83 which was found to be satisfactory.

Reliability of questionnaire was done using Cronbach's alpha value determined by average of four evaluators which was found to be 0.92 (excellent) agreement between evaluators.

### Results:

In this questionnaire study there were 200 participants (Dental professionals) among which Male Dentists were 109 and Female dentists were 91 in number. Maximum dentists were between 26 to 35 years of age and majority of the dental professionals were BDS degree holders.

### Conclusion:

Majority of the dental professionals were performing smile designing procedures and also had proper knowledge about the same.

### KEYWORDS:

Cosmetic dentistry, esthetics, facial appearance, Smile designing

## INTRODUCTION:

In modern dentistry, it is no longer acceptable to restore only individual teeth. A growing number of patients are demanding a final appearance that is not only physiologically and mechanically sound, but is also aesthetically pleasing.<sup>1</sup> According to scientific standards, the most beautiful and natural smiles are not always symmetrical, uniform in color, or perfect.<sup>1</sup> But more and more patients are demanding highly aesthetic results. Hence, dental procedures seem to be increasingly focused on appearance, which is a major focus for both patients and dentists.<sup>2</sup> With aesthetic dental and facial aspect of treatment, dentists should develop a treatment plan that is not only aesthetically pleasing but also healthy for the tooth tissue. To improve smile attractiveness, physicians should analyze smiles and faces in an objective and standardized manner and conduct comprehensive facial and dental assessments that address factors of patient dissatisfaction and concern. . Basic criteria for aesthetic analysis include facial, gingival, and dental esthetics.

With people's growing awareness of the importance of healthy teeth and a beautiful smile and various aspects of life such as social acceptance and self-confidence, and frequent exposure to patterns promoted on social networks as a measure of beauty, creating demand. For New Smiles If the patient's consciousness is minimal or distorted, the perceptual changes may persuade the patient to demand an unnatural outcome. For example, a patient's perception of an ideal smile may be consistent with extremely white, oversized teeth. However, patients should also be aware of the consequences, risks, and limitations of such treatment.

Digitalization of the procedures has improved the accuracy of the treatment. Digital technology to visually predict the results of cosmetic treatments and present them to patients can increase treatment acceptance rates. Many of these software programs are based on the concept of the Digital Smile Design (DSD) approach introduced by Ackermann and Coachman.<sup>3</sup>

Some newer generations of such programs can overcome the drawbacks of the conventional techniques using three-dimensional (3D) and even four-dimensional design (simulation of motion).

Creating the ideal smile requires an analysis and evaluation of the face, lips, gum tissue, teeth, and their overall appearance. Tooth color, shape and position are all part of the equation. Form follows function, and the recognition that anterior teeth play an important role in a patient's oral health is paramount. Using a comprehensive approach to aesthetic case diagnosis and treatment planning helps patients achieve smiles that best accentuate their overall facial image, with the added benefit of improved oral health.<sup>3</sup>

Creating a pleasant smile requires consideration of psychological, biological and mechanical factors simultaneously. Software for the medical field, 3D technology and biotechnology in recent years, these have collaborated synergistically to develop superior therapeutic tools for Smile Designing Procedures.<sup>4</sup>

Smile design principles require the integration of aesthetic concepts that harmonize the aesthetics of the face with the dental facial configuration and dental configuration. The dental facial configuration includes the lips and smile associated with the face. Tooth composition is particularly related to tooth size, shape, and position, as well as its relationship to alveolar bone and gingival tissue.<sup>5</sup> Smile design therefore involves evaluation and analysis of both the hard and soft tissues of the face and smile.

Patient analysis, evaluation, and treatment for smile design often involve a multidisciplinary therapeutic approach. Specialty treatments to achieve the ideal orthodontic smile include: periodontal care, including soft tissue repositioning and bone remodeling; cosmetic dentistry; and plastic surgery. This aesthetic approach to patient care maximizes the beauty of teeth to teeth.

Facial beauty is based on standard aesthetic principles such as correct facial alignment, symmetry and proportions.

## MATERIALS AND METHODS:

A questionnaire study was conducted among BDS and MDS professionals. The aim of the study was to access their knowledge, attitudes and practices regarding smile design. The participants were selected based on the following criteria - education criteria- BDS and MDS professionals. The input parameter for the sample size calculation used as follows: 80% power of the study, alpha error 0.05, effect size 0.5, and degree of freedom as 5. The calculated sample size was 184 using G\* power software version 3.1.9.2 (Heinrich Heine University, Dusseldorf). The final considered sample size for the Study was 200. The convenient sampling technique was used in the study. A structured, self-administered, close-ended questionnaire consisting of 4 parts and 33 questions on this topic was designed. The first part consisted of demographic data, the second part consisted of knowledge-based questions, the third part consisted of attitude questions, and the fourth part consisted of clinical practice questions.

The questionnaire was created using Google Forms (Google LLC, Mountain View, California, USA) and links were distributed to participants via email, What's App and other social media platforms (Telegram, Instagram, Facebook)

A pilot study was first conducted with 20 participants. A questionnaire validity (Aiken's V) of 0.83 was found to be sufficient. Questionnaire reliability was determined using the Cronbach alpha value. A consensus of 0.92 (excellent) was achieved among the evaluators. A brief introduction to the survey was given to the participants.

The collected data were entered into a spreadsheet (Microsoft Excel, 2016). Statistical analysis was performed using descriptive statistics (numbers and percentages). SPSS (Statistical Package for the Social Science) 23.0 version software (IBM Chicago, Illinois, United States) had been used.

**RESULTS:**

Table no. 1 :-

There were total of 200 dental professionals out of which 109 were male and 91 were female dental professionals. Maximum participants were between 26-35 years of age.

Table no. 2.:-

74.5% participants were firm about the principles of smile designing procedures must be minimally invasive, realign ideal form and function and should not compromise patients oral health. 71.5% dental professionals answered straight, curved, elliptical as most common shapes of smile zone. 75% participants think that hue, chroma, value decides the shade of the tooth. 74% dental professionals think that Philtrum of lip is considered as most accurate landmark to access the midline of face. 74% participants believe that tooth whitening procedure has side effects. 75% dental professionals think that diminished incisor size can be corrected using crown lengthening procedures. 71% participants believe that bleaching causes more side effects than crown lengthening procedures. 73% dental professionals believe that maxillary cuspids affects anterior guidance and occlusion in smile designing procedures. 74% of participants answered periodontal flap surgery can be the treatment of gummy smile. 73.5% of participants answered that 'M', 'S', 'E', 'F', 'V' are the phonetics that should be analysed for treatment planning of the smile designing procedures.

Table no. 3:-

62% dental professionals agree that smile designing is a team procedure. 70% of the dental professionals agree that general dentist can perform smile designing procedures. 61% dental professionals think that smile designing can improve self confidence in patients. 60.5% participants believe that digital dentistry has enhanced the scope of smile designing. 50% dental professionals think that dental insurance can cover smile designing cost. 12.5% participants think that all age groups can undergo smile designing procedures. 59% dental professionals think that there should be smile designing courses available for beginner dentists.

Table no 4:-

72.5% dental professionals perform smile designing procedures. Out of 100% 74% dentists make use of CAD/CAM in smile designing treatment planning. 38.5% dental professionals rarely call their patients postoperatively. 62% dental professionals think that lower socio economic class people can undergo smile designing procedures. 38.5% participants think that crowns are better option than veneers. 62% dentists believe that smile designing is a time consuming procedure. And 54.5% dental professionals think that females undergo smile designing procedures more frequently than males.

**TABLE NO-1: DEMOGRAPHIC DETAIL OF STUDY PARTICIPANTS (N=200)**

Sr.No	Demographic Details	Responses	Number (N)	%	Total N
1	Gender	Male	109	54.50%	200
		Female	91	45.50%	
2	Age	18-25	79	39.50%	200
		26-35	84	42%	
		36-45	35	17.20%	
		46-55	2	1%	
3	Education	BDS	159	79.50%	200
		MDS	41	20.50%	

**TABLE-2: KNOWLEDGE BASED QUESTION**

Sr.No	Questions	Responses	Number (N)	%	Total N
1	Which smile zone shapes are most common?	Bow shaped, rectangular, inverted	13	6.5	200
		Straight, curved, elliptical	143	71.5	
		Round, curved	35	17.5	
		None of the above	9	4.5	
2	The basic principles for smile designing procedures should be?	Minimal invasive	13	6.5	200
		Should not compromise patients oral health	17	8.5	
		Realign ideal form and function of teeth	21	10.5	
		All of the above	149	74.5	
3	In what terms we can decide color shade of tooth?	Hue, chroma, value	150	75	200
		Character	20	10	
		Saturation	27	13.5	
		None of the above	3	1.5	
4	What are the different types of facial	Plane, concave, convex	149	74.5	200

	profiles?	Straight	19	9.5	
		Square	23	11.5	
		Oval	9	4.5	
5	What are the aspects of lip morphology to be considered in smile designing?	Width, fullness	5	2.5	200
		Symmetry	16	8	
		Fullness, symmetry	32	16	
		All of the above	147	73.5	
6	What procedures are included in smile designing?	Bleaching	11	5.5	200
		Crown lengthning procedures	31	15.5	
		Ortho treatment	18	9	
		All of the above	140	70	
7	What are the side effects of tooth whitening procedures?	Sensitivity	8	4	200
		Gum ittritation	22	11	
		Inflammation of pulp	21	10.5	
		All of the above	149	74.5	
8	What are side effects of dental veneers ?*	Teeth sensitivity	13	6.5	200
		Increased risk of tooth pulp injury	17	8.5	
		Inflamed gums	19	9.5	
		All of the above	151	75.5	
9	Diminished incisor size can be corrected using?	Cosmetic crown lengthning	150	75	200
		Endodontic procedures	25	12.5	
		Periodontal procedures	17	8.5	
		None of the above	8	4	
10	Which phonetics are analysed in treatment planning for smile designing procedures?	'o', 'f', 'e'	9	4.5	200
		'm', 'a', 'v'	31	15.5	
		'm', 's', 'e', 'f', 'v'	147	73.5	
		'd', 'e', 'r', 'p'	13	6.5	

TABLE-3: ATTITUDE BASED QUESTION

1	Do you think smile designing is a team procedure?	Strongly agree	38	19	200
		Agree	124	62	
		Neutral	19	9.5	
		Disagree	14	7	
		Strongly disagree	5	2.5	
2	Do you believe a general dentist can perform smile designing procedures as efficiently as a specialist?	Strongly agree	33	16.5	200
		Agree	141	70.5	
		Neutral	10	5	
		Disagree	11	5.5	
		Strongly disagree	5	2.5	
3	Do you think smile designing can improve self confidence in patients?	Strongly agree	44	22	200
		Agree	122	61	
		Neutral	18	9	
		Disagree	7	3.5	
		Strongly disagree	9	4.5	
4	Do you believe digital dentistry has enhanced the scope of smile designing?	Strongly agree	50	25	200
		Agree	121	60.5	
		Neutral	13	6.5	
		Disagree	8	4	
		Strongly disagree	8	4	
5	Dental insurance covers smile designing costs ?	Strongly agree	25	12.5	200
		Agree	100	50	
		Neutral	53	26.5	
		Disagree	16	8	
		Strongly disagree	6	3	
6	All the age group people can undergo smile design procedures ?	Strongly agree	25	12.5	200
		Agree	114	57	
		Neutral	23	11.5	
		Disagree	11	5.5	
		Strongly disagree	7	3.5	
7	Should there be smile designing courses available for beginner dentist ?	Strongly agree	45	22.5	200
		Agree	118	59	
		Neutral	20	10	
		Disagree	10	5	

		Strongly disagree	7	3.5	
<b>TABLE-4: PRACTICE BASED QUESTION</b>					
1	Do you perform smile designing procedure ?	Always	22	11	200
		Often	145	72.5	
		Rarely	20	10	
		Never	13	6.5	
2	Do you make use of cad / cam in smile designing treatment planning ?	Always	24	12	200
		Often	148	74	
		Rarely	12	6	
		Never	16	8	
3	Does a patient needs to be recalled postoperatively ?	Always	25	12.5	200
		Often	86	43	
		Rarely	77	38.5	
		Never	12	6	
4	Is smile designing pocket friendly procedure for lower socio economic class people ?	Always	40	20	200
		Often	124	62	
		Rarely	23	11.5	
		Never	13	6.5	
5	Are use of crowns better option than veneers in smile designing?	Always	66	33	200
		Often	77	38.5	
		Rarely	42	21	
		Never	15	7.5	
6	Is smile designing a time consuming procedure?	Always	46	23	200
		Often	124	62	
		Rarely	20	10	
		Never	10	5	
7	Do females prefer smile designing procedure more than males ?	Always	64	32	200
		Often	109	54.5	
		Rarely	15	7.5	
		Never	12	6	

## DISCUSSION:

According to our survey 61% of dental professionals believe that smile designing can boost one's self confidence. Younger people are found to be most affected, as mal-aligned teeth create an awkward smile. Through cosmetic dentistry, we dentists can give young people new smiles that boost their confidence and self-esteem.

A smile is the facial expression of emotion by mimetic muscle contraction to reveal teeth in the upper jaw, which can affect how a person fits and functions in the aesthetic zone in general. Smile designing includes cosmetic and esthetic teeth reconstruction enhancing the smile creation. Cosmetic dentistry is the ultimate goal of most therapeutic interventions and procedures performed in various dental specialties.

In general, the following factors are considered important: the projection of the smile arch, the expression of the buccal corridor, the degree of gingival exposure during smiling, the presence of gingival-incisor asymmetry, and the presence of midline shift, and axial anteversion ratio, size, variation in maxillary symmetry and maxillary incisors.<sup>6</sup>

Caries repair and reconstruction, bleaching, bonding, and veneering have opened the door to a variety of selective dental treatments to improve appearance and often reverse the visual signs of aging. Smile design should always be a multi-factor decision-making process that enables physicians to treat patients with an individualized and multidisciplinary approach.<sup>7</sup>

Digital smile designing procedure can be used and is a digital aesthetic planning tool in dentistry that is used to evaluate the aesthetic relationship between the teeth, gingiva, smile and face. The use of DSD tools provides a new perspective for diagnosis and treatment Planning and facilitates communication between dentists, technicians and patients. Using DSD design tools makes it easier to create and project a new smile design to get a pre-visualisation of the final treatment plan result.<sup>8,9</sup>

Dentists and patients have complete control over the formation of a natural smile. Digital smile design can make it easier for dentists to visualise a patient's smile to form a treatment plan and provide knowledge about the procedure to patients.<sup>10</sup>

The combination of conventional and digital methods appears to be the best treatment option.<sup>11</sup>

As the demand to improve the appearance of teeth increases, restorative materials and restorative techniques continue to evolve to meet society's needs. There have been major advances in bleaching technology, dental restorative materials, the Smile Design program, prosthetic technology, and adhesives. Patients are able to select natural teeth and smiles that match their personal preferences and expectations with advanced digital tools. In the future, machine learning and AI will automate aesthetic evaluation, planning, design, and treatment processes to provide customized dental care that is truly patient centered, natural looking, and in harmony with facial and other features. However, the success of dental treatment aesthetically and functionally occurs clinically in the oral cavity.<sup>12</sup>

**RECOMMENDATIONS:**

People need to be made aware of the procedures and post-operative effects of these procedures that shape their smiles. In particular, the young generation in rural areas do not know the treatment plan, and the fact that they cannot receive treatment nearby means that they have to live without change. So it is the dentist's responsibility to create a smile that no one will be embarrassed about.

**CONCLUSION:**

Our questionnaire study found that all participants, i.e. dental professionals knew better about the procedures used to shape the smile.

Most dentists perform smile shaping procedures. Some dental professionals use traditional methods while some use newer digital methods. And by undergoing these procedures one can improve their facial features and increase their self-confidence in society.

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