



## Patient's Perception on the Esthetic Outcome of Anterior Fixed Prosthetic Treatment

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### ABSTRACT

**Overview:** Patient's perception to the esthetic result of the treatment received can be different from a dentist opinion. Understanding patient's opinion, demand and expectation is part of successful treatment procedure.

**Objective:** The purpose of this study was to investigate patient's opinion about the esthetic result of the fixed prosthetic treatment received in upper anterior teeth.

**Materials and methods:** About 90 volunteer subjects, 58 males and 32 females were given a self-evaluation questionnaire with 11 questions to respond as Yes or No. The questions regarded the esthetic result of a fixed prosthodontic treatment received for their upper anterior teeth. The same questioner was completed for each subject by three clinicians through clinical photographs for different views subject's smile. Agreement between patients and clinicians was calculated for all subjects to evaluate patient's perception to their esthetic results.

**Results:** An agreement of 47.8 to 72.2% was observed between patients and clinicians, and the average agreement was 53.64 to 60%. The highest agreement was related to satisfaction with the color of the crown and/or bridge margin while the least agreement was related to the satisfaction with the natural looking of the restoration.

**Conclusion:** There was variability in the agreement between the patients and the dentists with the satisfaction of the esthetic result of anterior restoration. Factor, such as gender, age and educational level may affect the results of the agreement.

**Keywords:** Agreement, Anterior fixed prosthesis, Esthetic, Patient, Perception.

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### INTRODUCTION

One of the major goals of dentistry is to re-establish esthetics and functions to feel confident about smiling without hiding the teeth.<sup>1</sup> Esthetics is one of the primary chief complaints for most patients seeking prosthodontics treatment.<sup>2</sup> Dental appearance may affected not only by person's facial attractiveness and personal characteristics, but also other people opinions.<sup>3,4</sup> Esthetic outcome is subjective, and both patient and dentist should be involved in esthetic assessment. Most people believe they can recognize an attractive smile, but individual opinion varies due to different factors, such as educations, socioeconomics and cultural factors.<sup>5,6</sup>

Previous studies discussed the difference between patient's perception to their own esthetic and smiles and how dentists view them.<sup>6-9</sup> Jannike et al 2007 interviewed 78 patients about esthetic features of their face and smile. They found that patients' opinions of their own smiles were significantly higher than the dentist's assessments, and dentists should be aware of patient's perception to their smile.<sup>7</sup> In a previous study, about clinical assessment of shade and shape of anterior restoration by patients and clinicians, agreements was occur in only 40.5 and 47.9% in the shade and the shape of the restoration respectively. Other factors, such as age, gender, practice sector and type of restoration were significantly affecting the results of the assessment.<sup>10</sup> Also cultural and sociodemographic may affect individual preferences.<sup>6,11</sup> Kokich et al 1999 showed in their study, while comparing the perception of dentist and lay people to dental esthetic, that the most noticeable

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discrepancy for orthodontists and general dentists is incisal plane asymmetry, whereas the most noticeable discrepancy for lay people incisor angulations.<sup>12</sup>

When dealing with esthetically driven treatment planning, the diagnosis should involve understanding the patient's requirements, demands, and expectations, prior to initiating any irreversible procedures.<sup>13</sup> Previous studies have repeatedly shown significant discrepancy between patient's and dentist's perceptions of esthetic treatment.<sup>14-17</sup> Tortopidis et al 2007 found that the relative difference between patient's perception and professional assessment of esthetic treatment need shows the importance of communication between dentist and patient in the esthetic dental treatment planning process.<sup>18</sup> Previous studies discussed different factors that affect patient's esthetic and smile. These factors involve incisal edge contour, right left symmetrical of shape and size, gingival marginal level, incisal angulations, shade matching, surface texture, contact, midline and metal margin of the crown.<sup>19-21</sup> The purpose of this study was to apply these Esthetic factors to investigate patient's opinion about the esthetic result of the fixed prosthodontics treatment received in upper anterior teeth, and to compare their perception with the professional assessment of the esthetic results of the prosthesis.

## MATERIALS AND METHODS

### Study Subjects

About 90 volunteers subjects, 58 males and 32 females participated in this study. All subjects were selected from patients who were treated in fixed Prosthodontics Clinics at the College of Dentistry of King Saud University during the period 2010 to 2011. All patients received crowns and/or bridges treatment in the upper anterior teeth during this period were contacted. Thirty minutes appointment was arranged for every patient response and agrees to participate in this study, and a written informed consent was given to each subject explaining the aim and procedure required. The study was registered and approval was granted by the College of Dentistry Research Center, King Saud University #IR 0006.

### Clinical Interview Self-evaluation

During the appointment, each subject was asked to sit on a regular chair in the dental clinic in front of a large face mirror 30 × 25 cm, and a written self-evaluation questionnaire was given to him/her. The questionnaire consists of 11 simple Yes or No questions items designed to measure the patient's perception of esthetic condition of the crown and/or bridge treatment received (Table 1). The self-evaluation questionnaire subjective composed

**Table 1:** Self-evaluation questionnaire used in the study

No.	Question	Yes	No
1	Are you satisfied with the color of your teeth?		
2	Are you satisfied with the length of your restoration?		
3	Are you satisfied with the width of your restoration?		
4	Are you satisfied with the bulkiness of your restoration?		
5	Are you satisfied with translucency of your prosthesis?		
6	Are you satisfied with the incisor crown angulations?		
7	Are you satisfied with the symmetrical size and shape of your teeth and prosthesis contour?		
8	Do you think your crown and/or bridge looks natural?		
9	Do you see your gum related to the prosthesis look healthy no redness and/or enlargement?		
10	Are you satisfied with the color of the margin of your crown and/or bridge?		
11	Do you see your gum interdental papilla fill the spaces between your teeth?		

the main aims of achieving simplicity and clarity and avoiding contents overlaps and complex terminology. Additional demographical data age, gender, and level of education have been included in the questionnaire.

### Professional Evaluation

The second professional evaluation was completed by two evaluators, and they were general dentists. Authors using the same questionnaire filled by the subjects. Only one questionnaire is filled for reach subject. When the two evaluators did not agree with the same answer, a third evaluator prosthodontist selects the final answer. The evaluators were completing the questionnaire through clinical photographs for different views subject's smile. Seven standardized digital photographs taken for each subject using EOS D20, Canon, Japan as following:

- Smile view with teeth appears while smiling.
- Frontal view with retracted upper and lower lips and upper and lower teeth are in contact.
- Frontal view with lips retracted for upper anterior teeth with slight mouth opening.
- Semi-lateral view toward right canine with retracted lips.
- Semi-lateral view toward left canine with retracted lips.
- Right lateral view for anterior teeth with retracted lips.
- Left lateral view for anterior teeth with retracted lips.



All photographs taken while patient in an upright position, camera was held in the same level and perpendicular to patient's upper anterior teeth with distant around 30 cm from patient's mouth.

The two evaluators held a series of calibration sessions to reduce the effect of examiner subjectivity. A sample of 12 subjects was assessed twice by each evaluator, with a period of 4 weeks between each assessment. Inter- and intraexaminer reliability was analyzed using Chi-square analysis. Statistical analysis of the data was done using Statistical Package for the Social Science (SPSS) program for windows version 21.0. Kappa statistics was calculated to measure the agreement between the answers of patients and evaluators for each question. A p-value of <0.05 was used to infer the results as statistically significant.

## RESULTS

About 90 patients were agreed to participate in this study 58 males and 32 females. The average age of the patients was 39.2 average age for male was 41.02 years, and for female was 35.84 years. Most of the patients were completed graduate schools or above 59% of male and 66% of female.

The results of the agreements between patients and dentists for the 11 questions are shown in Table 2. The agreement between patients and dentists was between 47.8 and 72.2%, and the average agreement was 53.64%. The highest agreement was related to question #10 about satisfaction with the color of the crown and/or bridge margin 72.2%. The least agreement was related to question #8 about the satisfaction with the natural looking of the restoration 47.8%. The agreements between patients and dentists were significant in 4 questions. These questions are related to the satisfaction with the color of the crown and/or bridge margin (72.2%), visibility of dark spaces between teeth (57.8%), symmetrical of size and shape of the crown and/or bridge with natural teeth (56.6%), and visibility of redness and/or swelling gum related to the prosthesis (55.5%).

## DISCUSSION

Understanding patient's perception to the esthetic criteria is very important during treatment planning for a restoration in esthetic zone area. Previous studies discussed patient's perception to the smile and esthetic criteria in general.<sup>1,6-9</sup> This study investigates patient's perception to the esthetic results of the prosthetic treatment received, and the difference and agreement for patients and dentists to the esthetic results of this treatment. The esthetic criteria selected for this study focused on the crown and/or bridge restoration, but not the natural teeth or smile of the patient. Age, gender and educational level have been considered in this study to have variety of subjects' opinions and perceptions.

Our study found that overall satisfaction of dentists to the results esthetic treatment was 44.4% comparing to 75.6% for patients. There is significant agreement between patient and dentists in several esthetic criteria. These criteria are: satisfaction with the color of the crown/bridge margin, visibility of dark spaces between teeth, symmetrical of size and shape of the crown/bridge with natural teeth, and visibility of redness and/or swelling gum related to the prosthesis. Generally, previous studies have found that dentists are more sensitive to the esthetic result of dental treatment.<sup>1,12,22</sup>

Color of the teeth is one of the most important esthetic criteria.<sup>23</sup> Our study showed patient satisfaction with their teeth shade by 72.2% 65 subjects from 90 comparing to 37.7% 34 subjects from 90 of dentists satisfaction with the color of the restoration. This result reflects the ability and sensitivity of the clinicians to detect minor deference in the color of the restoration comparing to patients.<sup>10</sup> Symmetrical balance of size and shape is another important criteria to be considered when restoring anterior teeth. Trained and observant eye readily detect what is out of balance or out of asymmetric.<sup>24</sup> Minor unilateral alteration of 1 to 1.5 mm in crown length, and 2 mm in crown width has been considered as a threshold

**Table 2:** Agreements between patients and dentists for the 11 questions

Question number	Patients		Dentists		Patients-dentists answers agreement	Kappa	p-value
	Yes	No	Yes	No			
1	65	25	34	56	45 (50%)	0.098	0.23
2	61	29	56	34	53 (58.9%)	0.10	0.34
3	68	22	65	25	57 (63.3%)	0.05	0.63
4	60	30	62	28	58 (64.4%)	0.186	0.077
5	72	18	62	28	62 (68.9%)	0.195	0.053
6	42	48	42	48	54 (60%)	0.196	0.062
7	65	25	36	54	51 (56.6%)	0.204	0.016
8	68	22	40	50	43 (47.8%)	0.075	0.38
9	70	20	36	54	50 (55.5%)	0.20	0.01
10	64	26	47	43	65 (72.2%)	0.434	p < 0.0001
11	60	30	36	54	52 (57.8%)	0.208	0.022

of unattractiveness.<sup>25</sup> Dentists are more sensitive to detect bilateral asymmetry than patients. In our study, 72.2% of patients were satisfied with symmetrical size and shape of their prosthetic restoration comparing to 40% for dentists. Regarding incisor crown angle, patients in our study were able to identify any discrepancy in the incisor angulations with same level of the dentists. This result is similar to previous study by Kokich et al claimed that the professional and lay people were able to identify the discrepancy at the same level, 2 mm from ideal incisor angulations.<sup>12</sup>

Esthetic results of prosthetic treatment are not related to the prosthesis only, but also the surrounding structures. In our study, there was three questions related to the surrounding structures Q#9, Q#10 and Q#11. The answers of these questions showed that patients have little concern with the proper esthetic results for the soft tissue around the prosthesis. Regarding the dark spaces between teeth open gingival embrasure, patients' satisfaction with the esthetic result was 66.7% comparing to 33.3% satisfaction for the dentists. Previous study showed that general dentist and lay people rated a 3 mm open gingival embrasure as noticeably less attractive than the ideal smile with a normal gingival embrasure.<sup>12</sup> Regarding the color of the margin of restoration, proper color of the margin gives natural looking for the crown and/or bridge. Patients are viewing the visible cervicofacial metal collar as an esthetic failure, even in the posterior region.<sup>26</sup> In our study, there was highly significant agreement between patient and dentists regarding their satisfaction with the color of restoration margin  $p < 0.0001$ .

In general, the agreement between patients and dentist was high with some esthetic criteria. Most of the patients participated in this study were treated in dental school by dental students under supervision of prosthodontist, or by faculty members prosthodontists. This helps to increase the agreement between patients and dentists opinions. Also, selecting cases for such kind of studies may affect the final results. Having variety of esthetic results of the treatment between poor to excellent esthetic prosthesis helps to give more reliability.

## CONCLUSION

There was a significant agreement between patients and dentists with some of the esthetic criteria. These are related to the satisfaction with the color of the crown and/or bridge margin, visibility of dark spaces between teeth, symmetrical of size and shape of the crown and/or bridge with natural teeth, and visibility of redness and/or swelling gum related to the prosthesis. Factor, such as gender, age and educational level may affect the results

of the agreement. However, the sample in this study was not enough to show significant effect of these factors. Further studies with bigger sample are recommended.

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