

Dental Aesthetics: A Study Comparing Patients' Own Opinions with Those of Dentists

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How to cite this paper: Moon, R.J. and Millar, B.J. (2017) Dental Aesthetics: A Study Comparing Patients' Own Opinions with Those of Dentists. *Open Journal of Stomatology*, 7, 225-233.

<https://doi.org/10.4236/ojst.2017.74016>

Received: January 24, 2017

Accepted: April 14, 2017

Published: April 17, 2017

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Abstract

Objective: A beautiful smile is perceived as important but the components that contribute to the patient's concept of a beautiful smile have not been fully investigated. Hence this study aimed to compare the views of patients on their own dental aesthetics with those of a group of dentists. It also assessed the patients' willingness to undergo aesthetic treatment. **Methods:** Fifty patients, who ranged in age from 24 to 76 years, completed self-assessment questionnaires. Photographs were taken of these patients, which were subsequently assessed by six dentists using a questionnaire with visual analogue scale to assess each parameter. **Results:** Significant differences ($p < 0.05$) were found between the opinions of the dentists and the patients. Older patients were generally more satisfied with their smile than the dentists. Eighty-six percent of the patients were willing to undergo aesthetic treatment, although factors such as the complexity of treatment, time involved, discomfort and financial costs, deterred many. The cost of treatment was the main deterrent. The younger patients were least likely to be put off treatment. **Conclusion:** Patients' views of their own smile differed from the dentists' opinion. Those who were the least satisfied and were most likely to undergo aesthetic treatment were in the younger age groups. Satisfaction increased with age and older patients were less likely to seek the aesthetic treatment.

Keywords

Dental Aesthetics, Self-Assessment, Patient, Dentist

1. Introduction

Patients are increasingly seeking cosmetic dental treatment and an attractive smile is often considered important to them. Studies have shown that attractive people are perceived as being more intelligent [1] and more popular [2]. The

importance of the smile in social attractiveness and even skill assessment is known [3] [4]. Patients who seek the cosmetic dental treatment are often those who consider themselves to be essentially normal in appearance but wish to make some improvements [5].

It is important that the prescribing clinician is aware about patient perceptions of aesthetics in order to satisfy their aesthetic needs even when the restorations are technically correct [6]. However, aesthetic opinions vary according to the person making the assessment [6] [7] [8] [9] [10].

Brisman's study [11] sought the opinions of patients, dental students and dentists, reporting that all groups preferred teeth of a similar shape, although the dentists preferred relatively longer and thinner teeth than the patients. Mehl *et al.* (2015) showed a difference between students and dentists and emphasised the need to teach aesthetics at dental school [7]. Prah-Andersen's study [12] compared the opinions of laypeople, general dentists and orthodontists, finding that the general dentists and orthodontists essentially agreed in their responses but as a combined group, they were much more critical than the laypeople that were more likely to accept increased or reverse overjets and mild crowding [12].

Shiyan *et al.* (2016) stressed the need to be aware of the difference in perception between orthodontists and patient [9]. Others agreed and found orthodontists were found to be more critical than general dentists [10] [13]. Geographic variation in opinions also exists [8].

Studies have shown that the demand exists for invasive and non-invasive aesthetic dental treatment [14]. If such treatment is to be carried out successfully, it is important that the dentist fulfils or exceeds the patient's aesthetic expectations. Some of the investigations have found similarities between patients' and dentists' opinions of beauty, whilst others have found disagreement [11] [12]. If the dentists are more critical of a patient's appearance than the patient is, then there is a risk that they may be over-treated. However, if they are less critical, then the patient may not be satisfied with the treatment outcome. Both factors could be relevant in the increasing complexity in managing patient's aesthetic concerns. The use of self-perception in assessing patients' treatment needs has been stressed [15].

The aims of the study were to compare the opinions of dentists on a patients' dental aesthetics with those of the patients themselves and to assess which factors influence patients' demand for treatment. Specific objectives were to look at age and gender in relation to self perception of dental aesthetics regarding tooth shape, shade, size, position and the impact of soft tissues and restorations.

2. Materials and Methods

This study was designed to compare dentists' perceptions of the aesthetic zone bounded by the lips during a smile matched to those of patients. Seven areas were assessed: the overall appearance, tooth shape, tooth shade, tooth size, position of the teeth, appearance of the gingiva and of any restorations or prosthetic teeth. The assessment was carried by looking at clinical photographs (**Figure 1**).

A questionnaire was designed by the authors and evaluated via a pilot study, designed to examine patients' overall satisfaction with the appearance of their anterior teeth (Table 1). Dentists assessed the aesthetics of the smile zone using photographs and a questionnaire as in other studies [8] [10].

In order to allow the patients time to assess their own dentition they were asked to complete the questionnaire at home. The subjects assessed the overall aesthetics as well as tooth shape, the shade of the teeth, tooth size, tooth position and the soft tissues and the aesthetic impact of any restorations present. Visual Analogue Scales (VAS) were used and the patients marked the points on the line



Figure 1. Photographic views and information for one of the patient assessments.

Table 1. The questionnaire used in the study.

Patient No. _____

Please mark a point on the line, below the question, indicating how satisfied you are with the issue covered by that question, ranging from completely unsatisfied ☹, to fully satisfied ☺.

For example:

☹ _____ X _____ ☺

How happy are you with the overall appearance of the anterior teeth?

☹ _____ ☺

How happy are you with the shape of the anterior teeth?

☹ _____ ☺

How happy are you with the shade of the anterior teeth?

☹ _____ ☺

How happy are you with the size of the anterior teeth?

☹ _____ ☺

How happy are you with the position of the front teeth?

☹ _____ ☺

How happy are you with the appearance of the gingiva, around the front teeth?

☹ _____ ☺

How happy are you with the appearance of any fillings, crowns or denture teeth present on the anterior teeth? (If none are present, please tick the following box)

☹ _____ ☺

that represented their view. Ethical permission for this analysis was not required at the time of the study (2003).

The patients were randomly selected from the patient list in a private general dental practice situated in Leeds city centre. The concept of the study was explained to the patients and those that were happy to participate were given questionnaires to take home, complete and return to the surgery in a stamp-addressed envelope.

The assessing dentists were given a similar questionnaire together with three photographs of each patient and information regarding the patient's overjet, overbite and the shade of the bodies of the central incisors (**Figure 1**). Scores were generated from the marked visual analogue scales by measuring the point at which they were marked. The marked point was measured to the nearest millimetre, where the point lay between whole numbers the score was rounded up. The lines were 10 cm long and therefore, the measured point gave a "score" out of 100.

Six dentists assessed the patients: two general practitioners, two orthodontists and two specialist (restorative or prosthodontic lists) dentists. The mean and standard deviation of the dentists' scores were then calculated for each question, patient by patient. From these figures 95% confidence intervals were calculated. Where the patient's own scores fell outside these intervals they were considered to be significantly different, from those of the dentists assessment of the images of the patients (t-test, $p < 0.05$).

In order to confirm repeatability, paired t-tests and an intra-class correlation coefficient (ICC) were performed on the dental assessors. Five randomly chosen patients were reassessed. ICCs were calculated for each dentist by comparing the scores given for all of the questions in the initial assessment and in the reassessment. An overall ICC was also calculated. An ICC above 0.70 is generally considered acceptable. All statistical analyses were performed by SPSS.

3. Results

Questionnaires were given to 60 patients, 52 of whom replied. Unfortunately 2 of these responses were returned too late to be analysed, therefore 50 patients were assessed. Of the respondents, 26 were female and 24 male with an age range from 24 to 76 years. The breakdown of the patients is shown in **Table 2**.

ICCs together with any associated bias were calculated for each of the assessing dentists. An ICC of 0.700 or greater is considered to indicate a high level of consistency, the measured ICCs ranged from 0.814 - 0.903 thus the consistency of the dentists was high.

Table 3 shows those patients who were more satisfied than the assessing dentists, whilst **Table 4** shows those who were less content. The results are expressed as percentages of the age group for both male and female respondents.

The final question regarding the appearance of restorations or prostheses caused the greatest difficulty. In 8 of the 50 assessments at least one the dentists could not detect restorations. In two cases, the patients gave scores for restorations

Table 2. Breakdown of patients enrolled in the study.

Pt Age	Female	Male	Total in age group
20 - 29 yrs	5	3	8
30 - 39 yrs	4	6	10
40 - 49 yrs	6	1	7
50 - 59 yrs	7	7	14
60 - 69 yrs	2	6	8
70 - 79 yrs	2	1	3
Totals	26	24	50

Table 3. Percentage of age group more satisfied than the assessing dentists.

AGE	20 - 29 yrs		30 - 39 yrs		40 - 49 yrs		50 - 59 yrs		60 - 69 yrs		70 - 79 yrs	
	F	M	F	M	F	M	F	M	F	M	F	M
Overall	20%	33%	25%	17%	50%	100%	57%	29%	0%	50%	100%	100%
Shape	0%	33%	25%	17%	33%	0%	71%	29%	0%	50%	50%	100%
Shade	0%	0%	0%	0%	67%	100%	14%	43%	0%	33%	50%	100%
Size	20%	33%	25%	17%	50%	100%	43%	29%	50%	33%	50%	100%
Position	20%	33%	0%	33%	50%	100%	29%	43%	0%	33%	50%	100%
Gingiva	20%	67%	25%	0%	33%	100%	29%	43%	0%	33%	50%	100%
Restorations	60%	0%	25%	0%	33%	0%	57%	43%	0%	50%	50%	100%

Table 4. Percentage of age group less satisfied than the assessing dentists.

AGE	20 - 29 yrs		30 - 39 yrs		40 - 49 yrs		50 - 59 yrs		60 - 69 yrs		70 - 79 yrs	
	F	M	F	M	F	M	F	M	F	M	F	M
Overall	20%	33%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shape	40%	33%	0%	0%	17%	0%	29%	0%	0%	0%	0%	0%
Shade	40%	67%	50%	67%	0%	0%	14%	14%	0%	0%	0%	0%
Size	40%	33%	0%	0%	0%	0%	0%	14%	0%	0%	50%	0%
Position	20%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%
Gingiva	60%	33%	0%	50%	17%	0%	14%	0%	50%	0%	0%	0%
Restorations	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

that were not present, whilst in another the patient and one of the dentists scored unrestored teeth. In four of the assessments the patients did not detect the presence of their restorations. In situations where not all of the dentists spotted the restorations, the values of those that did, have been used.

The questionnaire also asked how willing the patients would be to undergo dental treatment in order to improve their appearance. They were given various options ranging from refusal to have any treatment to acceptance of treatment no matter how time consuming, costly or uncomfortable. The results are shown in **Table 5**.

Table 5. The willingness or otherwise of patients to undertake aesthetic treatment as a percentage of their age group.

AGE	20 - 29 yrs		30 - 39 yrs		40 - 49 yrs		50 - 59 yrs		60 - 69 yrs		70 - 79 yrs	
	F	M	F	M	F	M	F	M	F	M	F	M
Pts unwilling to undergo aesthetic treatment	0%	33%	0%	17%	33%	100%	0%	0%	0%	17%	50%	0%
Pts willing to undergo treatment with NO provisions	60%	67%	25%	33%	17%	0%	0%	57%	0%	0%	0%	0%
Pts willing to undergo simple treatment only	40%	0%	25%	0%	33%	0%	14%	29%	0%	17%	0%	100%
Pts unwilling to undergo treatment because of time.	0%	0%	0%	17%	0%	0%	29%	0%	0%	0%	0%	0%
Pts unwilling to undergo treatment because of discomfort	0%	0%	25%	17%	0%	0%	43%	0%	50%	17%	50%	0%
Pts unwilling to undergo treatment because of costs	0%	0%	0%	67%	50%	0%	43%	14%	100%	50%	50%	0%

4. Discussion

This study was undertaken to find out whether dentists' perceptions of the aesthetic zone bounded by the lips during a smile matched those of patients. Seven areas were assessed: the overall appearance, tooth shape, tooth shade, tooth size, position of the teeth, appearance of the gingiva and of any restorations or prosthetic teeth. In all areas significant differences ($p < 0.05$) were found between the views of patients and the dentists.

As the study was carried out in a city centre private general dental practice there will be a sampling bias and, although the patients were randomly selected from the patient list, they may not represent the general population. Fifty patients took part in the study 26 women and 24 men, ranging in age from 24 to 76 years old. The small size of the study meant that in some of the age range groups there were only a very small number of participants.

Six dentists assessed the patients and all proved to be reliable with regard to their consistency as shown by the calculated intra-class correlation coefficients (ICC). In general the dentists were more critical than the patients as reported in other studies and more patients were satisfied with their appearance than were unsatisfied [13]. For satisfaction with their overall appearance, 40% of the respondents were significantly more content, than the dentists, with their appearance ($p < 0.05$). Whilst there was no gender bias, as in agreement with other studies [16], there was a tendency for older patients to be more content. By comparison only three of the patients (6%) were significantly less satisfied with their appearance; two of these were in the 20 to 29 year group and the other in the 30 to 39 year old group.

Tooth shape was considered to be significantly more pleasing by 34% of the patients, whilst only 12% were significantly less pleased ($p < 0.05$). In a similar distribution to "overall appearance", no sexual bias was found and a greater percentage of older patients were happier with their tooth shape than younger ones.

Similar findings were found regarding tooth size, where 36% were significantly more satisfied and 10% less satisfied than the assessing dentists ($p < 0.05$). Again there was an even split between men and women in the more content group and although a direct association with age was not found, there was a tendency for older patients to be more pleased.

The assessment of tooth position again found comparable results, 34% were significantly more satisfied whereas only 6% were less pleased than the dentists ($p < 0.05$). Patients' opinions on the appearance of their gingiva were not so one sided with 32% being significantly more content whilst 20% were less satisfied ($p < 0.05$). Younger patients again predominated in the less satisfied group of respondents, 70% of them lying in the 20 - 29 and 30 - 39 year old groups.

Nineteen patients significantly differed with the dentists in their views on the appearance of restorations or prosthetic teeth ($p < 0.05$). The vast majority were more content than the dentists and only one was less pleased. No direct association was found with age. It would therefore appear that the majority of patients are either as pleased as or are more pleased than the dentists on the appearance of their restorations. However, it is possible that the assessing dentists are particularly critical in this area, as they are looking at the work of other dental practitioners.

Tooth shade was the area where greatest dissatisfaction was found. Of the 25 patients who significantly disagreed with the assessing dentists ($p < 0.05$), 12 were unhappy with the shade of their teeth. Self-perception of tooth shade has been shown to be biased by patients who are unhappy with their body image overall [17].

One can speculate as to why the younger patients are more self-deprecating. They may be generally more image conscious and some may have celebrity role models whom they wish to copy. They may be embarking on new careers and feel that they need to improve their appearance in order to promote themselves. Or they may be looking for a partner and thus wish to appear as attractive as possible. By comparison, the older generations may not be so influenced by today's "image society". Perhaps they are more likely to be settled in a job or have a partner. They may simply have become used to their appearance and are now quite content with it. Hirsch *et al.* [18] put forward the theory of cognitive dissonance in his study where patients rapidly adapted to dentures whose appearance they initially disliked. It may be that older patients subconsciously ignore any displeasing features and concentrate on "better" areas. The reasons suggested above as to why younger patients are more discerning may of course apply to older patients and this may explain the dissatisfaction felt by some of these patients in this study.

Out of the 50 patients in the study 43 (86%) said that they would undergo dental treatment in order to improve their appearance. Therefore the desire for treatment is present amongst the patients. When the study looked at how willing patients would be to have aesthetic treatment carried out, it was the younger patients who were happier to have treatment, no matter how much time, discomfort or money was involved.

Ten patients would only have treatment if it were relatively simple and they were evenly spread between both sexes and age groups. Of those patients who would embark on more complicated treatment, the time involved did not put many off. However, the thought of pain dissuaded eight of these patients, six of

whom were women. There was no obvious age association.

The potential high cost of treatment was the area that would put most people off treatment. Thirty four percent of patients said that it would deter them; men and women shared this concern equally. Again no age association was found, however none of the patients in the 20 - 29 year old age group said that costs would put them off.

5. Conclusion

This was a relatively small study carried out in a private, city dental practice in the north of England and ideally a much larger and more widespread study should be carried out. However, that said interesting although perhaps not surprising results were recorded. This study found significant differences between the patients and the dentists in all of the areas that were examined ($p < 0.05$). In general, the patients were more satisfied that the dentists with their appearance. However, a number of patients were less satisfied and these tended to be the younger ones. Satisfaction with appearance was greater amongst the older patients. Least satisfaction was found in relation to the shade of the teeth. Eighty-six percent of the patients were willing to undergo the treatment in order to improve the appearance of their teeth. The issue that would deter most people from complex treatment was the financial cost, although no members of youngest group of patients were put off by this.

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