

# Factors Influencing Patients' Satisfaction with Anterior Teeth Restorations in Ha'il City, Kingdom of Saudi Arabia

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## ABSTRACT

**Background:** To develop broad-based treatment options for esthetics it is necessary to obtain a better understanding of the factors determining patient's satisfaction.

**Objective:** This study was designed to identify the association between the related factors and patient's satisfaction with their dental appearance and anterior teeth restoration.

**Materials and methods:** A cross-sectional study of 400 patients comprising of 120 males and 280 females within the age range 20 to 59 years were selected for this study from different dental clinics of Ha'il region. The data were collected based on a structured questionnaire by trained interviewers. The authors evaluate patient satisfaction with respect to demographic variables such as age, sex, educational qualification and level of income.

**Results:** Out of 400 population, the majority of the individuals participated in this study was females (70%) as compared to males (30%). Of these participants, the individual between age range 20 to 29 years (61.2%) seemed to be more satisfied with their dental appearance which is statistically significant ( $p < 0.007$ ), however, satisfaction rate among the Saudi population (64.8%) was comparatively low concerning their tooth color.

**Conclusion:** In general, a high level of dissatisfaction with participants' teeth color were evident in this study. Based on the results, that irrespective of the age group it provides us with important information for the potential need to understand patients' perception about their teeth appearance and color. It will help the dentist to carry an adequate and appropriate treatment plan to meet the desired level of patient satisfaction.

**Clinical significance:** The main goal of esthetic restoration is to achieve the best appearance of the teeth and at the same time preserve the vitality and function of the teeth. Appearance is considered the key element in social interaction and success nowadays. Hence, the esthetic of patients considered central to help people achieve optimum oral health without embarrassment.

**Keywords:** Anterior tooth restoration, Dental appearance, Ha'il city, Patient satisfaction

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## INTRODUCTION

Functional demands area a major concern for decades, but in recent years as the incidence of caries started to decline significantly; people have become more inclined towards esthetic dentistry.<sup>1</sup> Esthetic in dentistry is a term that literally defines an attractive beautiful smile combined with perfect teeth proportions.<sup>2</sup> Furthermore, an attractive smile not only depends on tooth color but also alignment, shape, amount of gingival exposure and visibility of the teeth and the available restoration.<sup>3</sup>

Maxillary anterior teeth are usually displayed when an individual smile and these teeth have an important contribution when it refers to assessing dental appearance.<sup>4,5</sup> Esthetics has become a key element in the modern era, as it, in turn, affects social interaction and self-esteem.<sup>6,7</sup>

Without understanding and exploring the patient's satisfaction regarding dental appearance, it is often difficult to reach the patient's satisfaction level. With the increase in age, teeth become darker because of natural phenomenon, which many people cannot accept and become unsatisfied with their dental appearance. Also, untreated dental caries, non-esthetic or discolored anterior teeth restorations and missing anterior teeth usually lead to dissatisfaction with dental appearance.<sup>8-10</sup>

Treatments are becoming increasingly demanding for patients who are not satisfied with their dental appearance. Of these mainly are tooth bleaching, porcelain crowning, and orthodontic treatment.<sup>6</sup> While patient demand for tooth whitening is at an all-time high, studies found that tooth color is an important determinant of patient satisfaction.<sup>11</sup> The socio-economic background factors were considered as well to have an important role that affects the association between dental factors and satisfaction towards dental appearance.<sup>12</sup>

Among the previous studies, a study that was carried out among Al-Jouf students in 2013, it was found that

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more than half of the study participants rated their teeth as esthetically unacceptable.<sup>13</sup> In 2016, a similar study was conducted in Albaha city, Kingdom of Saudi Arabia revealed that the majority of dental patients are not satisfied with the color.<sup>14</sup>

The treatment needs and the desired treatment options may differ between the choices of the dentists and the patients. Good communication between patient and physician has a strong influence on the patient's satisfaction and compliance. Dental professionals have to be aware of the psychological triggers of treatment demands of the patients, the effect of dental appearance in patients satisfaction, and subsequently the impact of this satisfaction in treatment success.

Based on a literature search, until today no study has been carried out in Ha'il region of Kingdom of Saudi Arabia to measure patient's satisfaction with their anterior teeth restoration. This study, therefore, aimed to assess the patient's satisfaction with existing dental restoration with respect to various determinants such as age, gender, income, and level of education.

## MATERIALS AND METHODS

This is an observational study, having a cross-sectional design. It included a total of 400 patients using nonprobability convenient sampling technique from the Northern part of Kingdom of Saudi Arabia, who attended different dental clinics between a period from November 2017 to April 2018, in Ha'il city. Written informed consent was taken from all the patients participated in this study. For the convenience of the study and to see the age-related differences, the participants were grouped in four age categories:

- *Group 1:* Age 20 to 29.
- *Group 2:* Age 30 to 39.
- *Group 3:* Age 40 to 49.
- *Group 4:* Age 50 to 59.

For the study, the patients who have the following treatments (composite filling/crown/bridge/denture group) were included. The data was collected through face-to-face interviews with a structured questionnaire to assess their satisfaction with the dental appearance and color of their maxillary anterior teeth which was marked as "satisfied" and "dissatisfied". The questionnaire consisted of questions on sociodemographic items including sex, age, level of education and income level. Patients were also asked about their satisfaction with tooth color, the general appearance of teeth (crowding, poorly aligned or protruding), and caries in anterior teeth. Additionally, patients were asked about their opinion about the existing treatment (acceptable or non-acceptable).

After entering data in the computer, data were verified and analyzed using Statistical Package for Social Science (SPSS) (version 22.0, SPSS, Chicago, IL, USA). The descriptive statistics such as percentages and numbers obtained to describe the studied sample. The inferential statistics including Chi-square test was used to detect the significant differences. A p-value < 0.05 considered as significant. The ethical approval was applied through the University of Ha'il, research and ethics committee and got approval under the number (H-216-024).

## RESULTS

A total sample of 400 participants was included in this study, of them 70% were females and 30% males with an age range between 20 to 59 years were included. The majority of the study participants had completed bachelor (60.8%) and the earning of most of the people (33%) was found to be less than 3000 SAR (Table 1).

Table 2 shows that the participants between age range 20 to 29 years (61.2%) agreed to be satisfied with their dental appearance with a significant p-value. However, most of the people (60.5%) of this age group were found to complain about their teeth color.

Figure 1 depicts that composite restoration was the preferred treatment option among the majority of the

**Table 1:** Distribution of study participants according to background characteristics

Variables	Frequency	Percent %
<i>Gender</i>		
Male	120	30.0
Female	280	70.0
<i>Age group</i>		
20–29	152	38.0
30–39	107	26.8
40–49	86	21.5
50–59	55	13.8
<i>Level of Education</i>		
Uneducated	16	4.0
Primary	10	2.5
Secondary	28	7.0
High school	103	25.8
Bachelor	243	60.8
<i>Income</i>		
Less than 3000	132	33.0
3000–7000	96	24.0
7000–11000	61	15.3
11000–15000	60	15.0
More than 15000	51	12.8
<i>Type of Restoration</i>		
Bridge	76	19.0
Crown	52	13.0
Composite restoration	237	59.3
Veneer	12	3.0
Removable denture	13	3.3
Implant	10	2.5

individuals (n = 237/59.3%) to improve dental esthetics followed by some of the patients had a bridge (n = 76) while others (n = 52) had a crown on single tooth depending on the need to treat the affected anterior teeth. Compare to these treatment options, a relatively less number of patients were using removable dentures, veneers or implants.

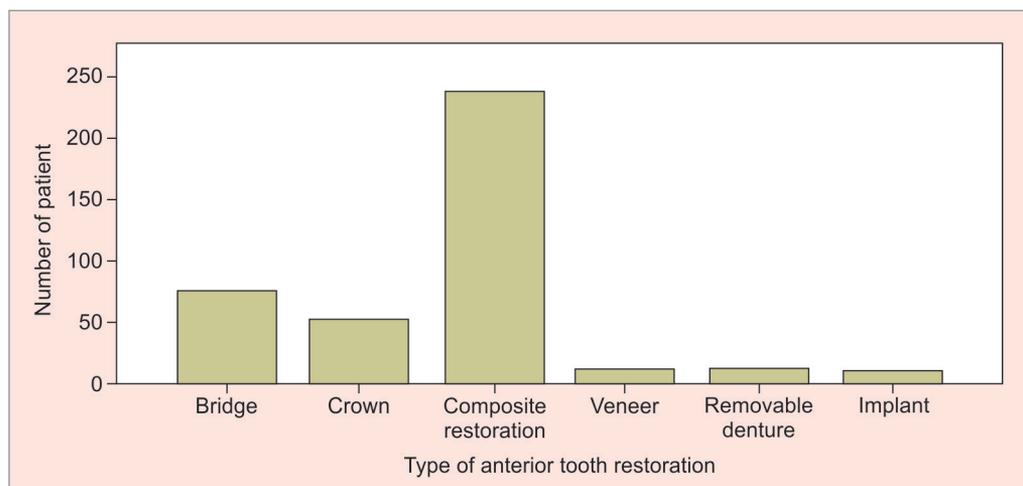
Table 3 shows that 51.1% and 54.2% of females and males respectively were satisfied with the general fea-

tures of their teeth, however, 67.5% of females were not satisfied at all with their teeth color. However, the overall percentage (61.3%) of people were satisfied with their treatment in general.

Concerning the level of income per month, Table 4 displays that individuals' earnings between 7,000 to 11,000 SAR (65.6%) followed by income more than 15,000 SAR (58.8%) express satisfaction with the general appearance

**Table 2:** Satisfaction of patient's dental appearance and anterior teeth restoration according to age

Age	Are you satisfied with the general appearance of your teeth?		Total	p-value
	Yes	No		
20–29	(61.2%) 93	(38.8%) 59	(38%) 152	0.006
30–39	(51.4%) 55	(48.6%) 52	(26.8%) 107	
40–49	(47.7%) 41	(52.3%) 45	(21.5%) 86	
50–59	(34.5%) 19	(65.5%) 36	(13.8%) 55	
Total	(52%) 208			
	Are you satisfied with your teeth color?		Total	p-value
	Yes	No		
20–29	(39.5%) 60	(60.5%) 92	(83%) 152	0.309
30–39	(35.5%) 38	(64.5%) 69	(26.8%) 107	
40–49	(33.7%) 29	(66.3%) 57	(21.5%) 86	
50–59	(25.5%) 14	(74.5%) 41	(13.8%) 55	
Total	(35.3%) 141	(64.8%) 259	(100%) 400	
	Patient's assessment of their existing restoration?		Total	p-value
	Not acceptable	Acceptable		
20–29	(44.1%) 67	(55.9%) 85	(83%) 152	0.119
30–39	(58.9%) 63	(41.1%) 44	(26.8%) 107	
40–49	(46.5%) 40	(53.5%) 46	(21.5%) 86	
50–59	(49.1%) 27	(50.9%) 28	(13.8%) 55	
Total	(49.3%) 197	(50.8%) 203	(100%) 400	
	Are you satisfied with your treatment?		Total	p-value
	Yes	No		
20–29	(66.4%) 101	(33.6%) 51	(83%) 152	0.393
30–39	(56.1%) 60	(43.9%) 47	(26.8%) 107	
40–49	(60.5%) 52	(39.5%) 34	(21.5%) 86	
50–59	(60%) 33	(40%) 22	(13.8%) 55	
Total	(61.5%) 246	(38.5%) 154	(100%) 400	



**Fig. 1:** Number of patients' versus different anterior tooth restoration

**Table 3:** Gender distribution in relation to patient's contentment to dental appearance and restoration

		<i>Are you satisfied with the general appearance of your teeth?</i>			<i>p-value</i>
<i>Sex</i>		<i>Yes</i>	<i>No</i>	<i>Total</i>	
	Male	(54.2%) 65	(45.8%) 55	(30%) 120	0.570
	Female	(51.1%) 143	(48.9%) 137	(70%) 280	
<b>Total</b>		(52%) 208	(48%) 192	(100%) 400	
		<i>Are you satisfied with your teeth color?</i>			
<i>Sex</i>		<i>Yes</i>	<i>No</i>	<i>Total</i>	
	Male	(41.7%) 50	(58.3%) 70	(30%) 120	0.079
	Female	(32.5%) 91	(67.5%) 189	(70%) 280	
<b>Total</b>		(35.3%) 141	(64.8%) 259	(100%) 400	
		<i>Patient's assessment of their existing restoration?</i>			
<i>Sex</i>		<i>Not acceptable</i>	<i>Acceptable</i>	<i>Total</i>	
	Male	(50%) 60	(50%) 60	(30%) 120	0.844
	Female	(48.9%) 137	(51.1%) 143	(70%) 280	
<b>Total</b>		(49.3%) 197	(50.3%) 203	(100%) 400	
		<i>Are you satisfied with your treatment?</i>			
<i>Sex</i>		<i>Yes</i>	<i>No</i>	<i>Total</i>	
	Male	(67.5%) 81	(32.5%) 39	(30%) 120	0.106
	Female	(58.9%) 165	(41.1%) 115	(70%) 280	
<b>Total</b>		(61.5%) 246	(100%) 400	(100%) 400	

**Table 4:** Satisfaction of patient's dental appearance and anterior teeth restoration with level of income

		<i>Are you satisfied with the general appearance of your teeth?</i>			<i>p-value</i>
<i>Income (per month)</i>		<i>Yes</i>	<i>No</i>	<i>Total</i>	
	Less than 3000	(50%) 66	(50%) 66	(33%) 132	0.092
	3000-7000	(44.8%) 43	(55.2%) 53	(24%) 96	
	7000-11000	(65.6%) 40	(34.4%) 21	(15.3%) 61	
	11000-15000	(48.3%) 29	(51.7%) 31	(15%) 60	
	More than 15000	(58.8%) 30	(41.2%) 21	(12.8%) 51	
<b>Total</b>	(52%) 208	(48%) 192	(100%) 400		
		<i>Are you satisfied with your teeth color?</i>			
<i>Income (per month)</i>		<i>Yes</i>	<i>No</i>	<i>Total</i>	
	Less than 3000	(34.1%)45	(65.9%)87	(33%)132	0.136
	3000-7000	(33.3%)32	(66.7%)64	(24%)96	
	7000-11000	(41%)25	(59%)36	(15.3%)61	
	11000-15000	(25%)15	(75%)45	(15%)60	
	More than 15000	(47.1%)24	(52.9%)27	(12.8%)51	
<b>Total</b>	(35.3%)141	(64.8%)259	(100%)400		
		<i>Patient's assessment of their existing restoration?</i>			
<i>Income (per month)</i>		<i>Not acceptable</i>	<i>Acceptable</i>	<i>Total</i>	
	Less than 3000	(47%)62	(53%)70	(33%)132	0.252
	3000-7000	(55.2%)53	(44.8%)43	(24%)96	
	7000-11000	(49.2%)30	(50.8%)31	(15.3%)61	
	11000-15000	(55%)33	(45%)27	(15%)60	
	More than 15000	(37.7%)19	(62.7%)32	(12.8%)51	
<b>Total</b>	(49.3%)197	(50.8%)203	(100%)400		
		<i>Are you satisfied with your treatment?</i>			
<i>Income (per month)</i>		<i>Yes</i>	<i>No</i>	<i>Total</i>	
	Less than 3000	(59.8%)79	(40.2%)53	(33%)132	0.963
	3000-7000	(63.5%)61	(36.5%)35	(24%)96	
	7000-11000	(59%)36	(41%)25	(15.3%)61	
	11000-15000	(63.3%)38	(36.7%)22	(15%)60	
	More than 15000	(62.7%)32	(37.3%)19	(12.8%)51	
<b>Total</b>	(61.5%)246	(38.5%)154	(100%)400		

of their teeth. The overall percentage of satisfaction on their tooth color was low when compared among Saudi population (35.3%).

Table 5 displays the relationship between education level and patients satisfaction about their dental esthetics. It was found that 59.7% of people having bachelor degree were satisfied with their dental appearance. Dissatisfaction rate about dental appearance is higher in uneducated (81.3%), followed by high school (57.3%). Overall satisfaction rate about teeth color is comparatively low among Saudi population (64.8%).

**DISCUSSION**

This study aims to investigate the factors related to patients' satisfaction with their dental appearance and/or anterior tooth restorations. People have different concepts and expectation when they are asked to interpret their dental appearance and esthetics. This may differ between individual and population, may vary from community to another and/or even in the same community<sup>15</sup> Many cultural

backgrounds and personal preferences affect the notion and perspective regarding dental appearance, which actually changes our views often as time progresses.<sup>16</sup>

Dental appearance is an important feature in determining the attractiveness of a face. In our study, 52% of participants were satisfied with the appearance of their teeth. These findings correlate with other studies conducted in different populations such as 47.2% in Malaysia,<sup>17</sup> 57.3% in Turkey,<sup>8</sup> 65% in Palestine,<sup>18</sup> 65.5% in Jordan<sup>18</sup> and 76% in UK<sup>19</sup> showed different levels of satisfaction. In this study, the younger (61.2%) age group (20 to 29) showed to be more satisfied than (34.5%) older age group (50 to 59) and the results were found to be statistically significant. This concurs the results of previous studies.<sup>9,17,18</sup> However, it disagrees with the results of previous studies that showed that older subjects were more satisfied with the dental appearance.<sup>8,19,20</sup> This can be explained by the fact that people use different measures to evaluate satisfaction based on personal choice, which is intertwined with cultural factors, race, and religious prejudice.<sup>9,11</sup>

**Table 5:** Satisfaction of patient's dental appearance and maxillary anterior teeth restoration with level of education

Level of education	Are you satisfied with the general appearance of your teeth?		Total	p-value
	Yes	No		
Uneducated	(18.8%)3	(81.3%)13	(4%)16	0.001
Primary	(40%)4	(60%)6	(2.5%)10	
Secondary	(42.9%)12	(57.1%)16	(7%)28	
High school	(42.7%)44	(57.3%)59	(25.8%)103	
Bachelor	(59.7%)145	(40.3%)98	(60.8%)243	
Total	(52%)208	(48%)192	(100%)400	
Level of education	Are you satisfied with your teeth color?		Total	p-value
	Yes	No		
Uneducated	(18.8%)3	(81.3%)13	(4%)16	0.311
Primary	(50%)5	(50%)5	(2.5%)10	
Secondary	(39.3%)11	(60.7%)17	(7%)28	
High school	(30.1%)31	(69.9%)72	(25.8%)103	
Bachelor	(37.4%)91	(62.6%)152	(60.8%)243	
Total	(35.3%)141	(64.8%)259	(100%)400	
Level of education	Patient's assessment of their existing restoration?		Total	p-value
	Not acceptable	Acceptable		
Uneducated	(56.3%)9	(43.8%)7	(4%)16	0.529
Primary	(50%)5	(50%)5	(2.5%)10	
Secondary	(60.7%)17	(39.3%)11	(7%)28	
High school	(52.4%)54	(47.6%)49	(25.8%)103	
Bachelor	(46.1%)112	(53.9%)131	(60.8%)243	
Total	(49.3%)197	(50.8%)203	(100%)400	
Level of education	Are you satisfied with your treatment?		Total	p-value
	Yes	No		
Uneducated	(50%)8	(50%)8	(4%)16	0.181
Primary	(90%)9	(10%)1	(2.5%)10	
Secondary	(57.1%)16	(42.9%)12	(7%)28	
High school	(56.3%)58	(43.7%)45	(25.8%)103	
Bachelor	(63.8%)155	(36.2%)88	(60.8%)243	
Total	(61.5%)246	(38.5%)154	(100%)400	

Among the significant factors affecting overall dental appearance, tooth color is a critical determinant influencing satisfaction with smile appearance and especially with restored anterior teeth.<sup>11</sup> In the present study, the majority of study participants were unsatisfied with their teeth color, and the question concerning teeth color had the lowest satisfaction rate in respect to age, gender, education, and income level. This finding is in agreement with previous results, where dissatisfaction with tooth color may be the primary reason for dissatisfaction with dental appearance.<sup>6</sup> A common complaint among most of the people is their tooth turning yellow, or discoloration of color matched restoration. Depending on extrinsic or intrinsic causes of discoloration, changing in dietary lifestyle, good home care and regular professional cleanings can help remove discoloration of teeth. However, sometimes it may be irreversible or more difficult or takes a longer time to change.

Generally, in terms of beautiful women are known to be more interested in attractiveness and dental esthetics. Thus, in the present study, women, in general, were found more likely to be unsatisfied with their dental appearance (51.1%) and complained more about tooth color (67.5%) than men. Almost 50% of females were not satisfied with the existing restoration and regarded it as unesthetic. This is consistent with the results of the studies,<sup>6,17</sup> while the other studies found this difference was not significant.<sup>8,21</sup> This simply could be justified that women care more about their appearance and concerned more to make their teeth look whiter with an attractive smile.

In the present study, we further explored the relationship between patient's satisfaction by examining both education and household income as indicators of assessment of dental appearance and anterior restoration.

In our study, dissatisfaction rate about dental appearance is higher in uneducated (81.3%), followed by high school (57.3%) and bachelor graduates (40.3%). Overall satisfaction rate about teeth color is comparatively low among Saudi population (64.8%). It can be concluded that patients with higher level of education (bachelor) have better access to health care, hence more likely to be satisfied with their dental appearance, in comparison to those with low level of education. This positive association between level of education and satisfaction rate was in agreement with the findings of other similar studies,<sup>8,21</sup> while the study among Malaysian population found no significant association.<sup>17</sup>

It was noted that around 55% of the population who have comparatively lower income (3000–7000 SAR) were not satisfied with the existing restoration. This can be justified that having relatively low income presents a variety of problems with access to adequate health care system. Since treatment for dental problems is more

expensive and lack of dental coverage available for low-income people results in subsequent lack of proper oral health care when needed.

Results of the study showed that composite filling is the most common restoration in anterior teeth of the respondents (59.3%). This was expected because of their awareness of oral health maintenance, restore the carious tooth, or may be due to comparatively low price in comparison to other prosthetic restoration. A significant difference between dentist and patient's perception of esthetic was reported in a prior study conducted in Ha'il.<sup>22</sup> Some of the properties of this material need to be upgraded like inability to completely replicate natural teeth in color, low wear resistance, surface porosity, and polymerization-induced shrinkage; otherwise it will certainly influence the patient's level of satisfaction.<sup>23</sup> Therefore, these materials need to improve their performance to meet patients' expectation level. A study in Ha'il has reported that a significant amount of people have the knowledge of esthetic and teeth replacement, although the main source of acquiring knowledge was dentist himself.<sup>24</sup> Interestingly despite advancement in esthetic dentistry, a study in Hail reported the use of various traditional methods for esthetic purpose.<sup>25</sup>

The limitation of the study was the small sample size for the older age group and the distribution of the population, which limit some of the ability to conduct a thorough analysis. Therefore, to generalize the results for larger groups, further study should involve more participants with a sufficient number in each age group. We encourage conducting such research in other parts of Kingdom of Saudi Arabia to have more functional results and exert a long-term impact on improving dental esthetic treatment.

## CONCLUSION

Most patients in this study were not satisfied with their tooth color with a greater percentage of females expressing dissatisfaction than males. Socioeconomic status is deeply intertwined with access to dental care. People with low income have difficulty accessing services due to economic restraints and fail to receive a proper service needed for their dental problems. Likewise, higher the educational qualification, greater the level of personal income reflect better access to health care with more satisfaction in various treatment choices.

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