ABSTRACT

Aim: The aim of this study was to evaluate the factors influencing the satisfaction of dental appearance and attitude toward treatments to improve dental esthetics among patients attending a dental teaching center.

Methods: A questionnaire was used to collect data of four background variables among 450 patients attended a dental teaching center in the city of Irbid in Jordan. The questionnaire enclosed self-reported questions about the appearance of anterior teeth, received esthetic treatment and desired treatment for improving esthetics. Descriptive, multiple logistic regression and Chi-square tests were used for data analysis (p ≤ 0.05).

Results: The 450 participants consisted of (66.2%) male and (33.8%) female. Of these, 69.3% were satisfied with their dental appearance and 58.0% with the color of their teeth. Esthetic restorations were the most received treatment (39.8%) and whitening of teeth was the most desired treatment (55.3%). The patients’ satisfaction with dental appearance was influenced by teeth color, feeling teeth are crowded and receiving whitening (p < 0.05. r = 0.561, r² = 0.315). The most desired esthetic treatments influenced by the satisfaction with dental appearance were esthetic restorations and orthodontics (p < 0.05. r = 0.223, r² = 0.05). Significantly more female reported having esthetic restorations and orthodontics (p = 0.008, 0.015, 0.028). Significantly more male reported having esthetic restorations (p = 0.008, 0.000) and desired to have orthodontic, crowns or veneers and esthetic restorations (p = 0.000, 0.015, 0.028).

Conclusion: Satisfaction with dental appearance was affected by teeth color, feeling teeth are crowded, desire for esthetic restorations and orthodontic treatment. A high percentage of patients were not satisfied with the color of their teeth.

Clinical Significance: Recognizing the factors that affect patients’ satisfaction with their present dental appearance and attitude toward treatments to improve dental esthetic can guide clinicians to strategies to improve esthetics.

Keywords: Cross-sectional study, Dental teaching, Esthetics, Patient.

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INTRODUCTION

The concept of esthetics in dentistry is not a new issue. Studies have shown that esthetic considerations are one of the primary reasons to request dental treatment. However, as the increase in the demand of tooth whitening services and cosmetic dentistry and as the media in general emphasize the effect of a pleasing smile, esthetics has become a major concern for both the patient and the dentist.

Discrepancy between the dentist’s and the patient’s perception of esthetic needs, which in some cases may result in an esthetic appearance lower than the patient’s expectations, has been found. Thus, the attitude of the patient toward dental esthetics and preferences should be recognized in any treatment plan of the dentist in order to reach the expectations of his or her patient and to reduce the discrepancy between the dentist’ assessment and the patient’ perception of esthetic needs.

Sociodemographic factors such as gender, age and educational level have an impact on the patient’s perception of dental esthetics. Females are reported to
be more sensitive than males regarding the appearance of
teeth and the importance of teeth appearance decreases
with aging; also patients with limited education had a
greater preference for whiter teeth than patients with a
high level of education.\textsuperscript{5} Perceived dental treatments on
anterior teeth also have an impact on dental esthetics. It
has been also shown that esthetic restorative treatment
has a positive effect on the patients’ self-esteem,\textsuperscript{9} and
patients’ satisfaction with their dentition has an impact
on their daily living and quality of life.\textsuperscript{10} Therefore, it is
of vital importance for the dentist to be able to define
what exactly the patient requires and what actually he
or she needs relative to the esthetic restorative treatment.

The differences in the perception of a beautiful smile not
only exist among individuals but also between cultures.\textsuperscript{11}
Therefore, the professional opinion may not be consistent
with the perception and expectations of the subject.\textsuperscript{5}
Information has been published about patient satisfaction
with dental esthetic and attitude toward improvement
of esthetics of different populations.\textsuperscript{4,12-16} Recognizing
the perception of the patients and their satisfaction with
the present dental appearance and desired treatments to
improve dental esthetic can guide clinicians to strategies
to improve esthetics. However, there is currently little
information on the patients’ perception of their dental
esthetics and attitude toward improvement of dental
esthetics among Jordanian patients.

Thus, the aims of this study were to evaluate the
factors influencing patients’ satisfaction with dental
appearance, self-reported previously received dental
treatments on anterior teeth and the patient’s attitude
toward dental treatment for improvement of esthetic
among patients who reported to the Department of
Conservative Dentistry at a dental teaching center that
belongs to the Faculty of Dentistry.

\textbf{METHODS}

A cross-sectional survey to determine attitude toward
dental appearance and treatment for improving dental
esthetics among patients who attended the Department
of Conservative Dentistry at a dental teaching center
that belongs to the Faculty of Dentistry and located in
the city of Irbid, a major city in the north of Jordan, was
conducted. All included patients were adults older than
18 years, had no clear evidence of cognitive disturbances
and did not receive dental treatment in the previous
6 months, and have no missing anterior teeth. All the
patients who reported to the department of conservative
dentistry in the college of dentistry, Irbid, over a period of
2 months with the above inclusion criteria were included
in the study after they were informed of the nature of the
investigation and gave their consent.

A structured, interviewer-guided questionnaire was
used for data collection (Table 1). The questionnaire

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|}
\hline
\textbf{Gender} & \textbf{Male} & \textbf{Female} \\
\hline
\textbf{Education level:} & Primary school & High school \\
& University degree & Postgraduate degree \\
& Less than 250 JD & 250–500 JD \\
& 500–1000 JD & More than 1000 JD \\
\hline
\textbf{Income:} & & \\
\hline
\textbf{Questions about patient satisfaction with dental appearance} & & \\
1. Are you satisfied with your anterior teeth appearance? & Yes & No \\
2. Are you satisfied with the color of your anterior teeth? & Yes & No \\
3. Do you feel your anterior teeth are crowded? & Yes & No \\
4. Do you feel your anterior teeth are poorly aligned? & Yes & No \\
5. Do you have dental caries in your anterior teeth? & Yes & No \\
6. Do you have non esthetic restorations in your anterior teeth? & Yes & No \\
7. Are you hiding your teeth during smiling? & Yes & No \\
8. Did you previously receive any of the following treatment(s) on your anterior teeth? & & \\
\quad Whitening of teeth & Yes & No \\
\quad Orthodontic treatment & Yes & No \\
\quad Crowns or veneers & Yes & No \\
\quad Esthetic restorations & Yes & No \\
\hline
\textbf{Questions about patient’s attitude toward dental treatment for improvement of esthetics} & & \\
\quad Whitening of teeth & Yes & No \\
\quad Orthodontic treatment & Yes & No \\
\quad Crowns or veneers & Yes & No \\
\quad Esthetic restorations & Yes & No \\
\hline
\end{tabular}
\caption{Study questionnaire}
\end{table}
consisted of questions on socio-demographic items as well as questions on each patient’s satisfaction with his/her dental appearance, received and desired dental treatment for improvement of esthetics. A single trained investigator recorded answers from the patients. A pilot study was carried out with 20 patients to check the feasibility of the study, and the questions were modified accordingly. These subjects were excluded from the final study.

The results were tabulated and analyzed using the Statistical Package for Social Sciences (SPSS) for Windows (version 14.0; SPSS Inc, Chicago, IL, USA). Descriptive statistics such as frequency and percentages for categorical variables were determined. Factors that influenced patients’ satisfaction with dental appearance were determined and variables selected for inclusion in the logistic regression analysis model were determined according to the best model fit. Linear regression with stepwise correlation was used to analyze the correlation between the dependent variable (satisfaction with dental appearance) and the independent variables (satisfaction with teeth color, anterior teeth crowding, anterior teeth alignment, presence of dental caries, presence of nonesthetic restorations on anterior teeth, and if the participant received treatment such as orthodontic, esthetic restorations, crowns or veneers or whitening), in addition to the correlation between hiding teeth during smile and satisfaction with dental appearance. Linear regression was also used to analyze the correlation between the dependent variable and the participants desire to receive specific treatment to improve the esthetic of anterior teeth. The Chi-square test was used to assess the significant effect of each demographic variable and satisfaction with dental esthetic and to compare the male and female participants’ responses to the survey questions. The level of significance was set at ≤0.05.

RESULTS

The demographic background distribution of the patients and their response to the survey questions are summarized in Tables 2 and 3. Four hundred fifty patients participated in this study, 66.2% of whom were male and 33.8% were female. Age ranged from 18 to 56 years with a mean age of 27.5 ± 7.4 years. The Chi-square test results showed that there was no significant impact of any of the demographic variables on the patients’ general satisfaction with dental appearance (Table 2).

About 69.3% of the patients were satisfied with their dental appearance and 58% of the subjects were satisfied with their teeth color. Regression analysis showed that patients’ general dissatisfaction with dental appearance was influenced mostly by anterior teeth color and anterior teeth crowding (p<0.05, r=0.561, r²=0.315). It was found also that the patients’ general dissatisfaction is highly correlated with previously receiving whitening procedures and hiding one’s teeth during smiling. However, it should be addressed that hiding teeth during smiling is a consequence of dissatisfaction, not a cause of it. Regression analysis also showed that the mostly desired esthetic treatments influenced by the general dissatisfaction with dental appearance were esthetic restorations and orthodontic treatment (p<0.05. r = 0.223, r² = 0.05) (Table 3).

Results of the Chi-square test showed that significantly more females reported having nonesthetic restorations in their anterior teeth (p = 0.012). Furthermore, results showed that significantly more female patients received esthetic restorations and orthodontic treatment than male patients (p = 0.011, 0.001 respectively). Significantly more females than males desired to have orthodontic treatment, crowns or veneers and esthetic restorations (p=0.001, 0.017, 0.035 respectively), (Table 4).

DISCUSSION

Patients’ satisfaction with their dental appearance has been of a major concern for the dentists, as it is the key for success for any treatment plan especially when it includes the esthetic region. In this study, the overall rating of satisfaction with dental appearance was 69.3%. Compared with our results, previous studies showed that satisfaction with dental appearance was lower in some populations, for example 57.3% in Turkey,15 47.2% in Malaysia16 and 50% in Saudi Arabia,17 while it was closer...

<table>
<thead>
<tr>
<th>Subjects’ demographic background</th>
<th>No (%)</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>No (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>N=450</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>298 (66.2)</td>
<td>212 (47.9)</td>
<td>86 (62.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>152 (33.8)</td>
<td>100 (22.1)</td>
<td>52 (37.7)</td>
<td>0.244</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–20</td>
<td>79 (17.6)</td>
<td>61 (14.7)</td>
<td>18 (13.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21–29</td>
<td>256 (56.9)</td>
<td>176 (38.8)</td>
<td>80 (58.0)</td>
<td>0.017</td>
<td></td>
</tr>
<tr>
<td>≥30 years</td>
<td>115 (25.6)</td>
<td>75 (16.5)</td>
<td>40 (29.0)</td>
<td>0.195</td>
<td></td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>12 (2.7)</td>
<td>5 (1.1)</td>
<td>7 (5.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>101 (22.4)</td>
<td>68 (15.1)</td>
<td>33 (23.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>293 (65.1)</td>
<td>209 (46.7)</td>
<td>84 (60.9)</td>
<td>0.035</td>
<td></td>
</tr>
<tr>
<td>Postgraduate</td>
<td>44 (9.8)</td>
<td>30 (6.7)</td>
<td>14 (10.1)</td>
<td>0.165</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;240</td>
<td>206 (45.9)</td>
<td>147 (41.7)</td>
<td>59 (43.1)</td>
<td>0.102</td>
<td></td>
</tr>
<tr>
<td>250-500</td>
<td>118 (26.3)</td>
<td>79 (17.5)</td>
<td>39 (28.5)</td>
<td>0.012</td>
<td></td>
</tr>
<tr>
<td>500-1000</td>
<td>77 (17.1)</td>
<td>55 (12.7)</td>
<td>22 (16.1)</td>
<td>0.244</td>
<td></td>
</tr>
<tr>
<td>&gt;1000</td>
<td>49 (10.8)</td>
<td>31 (7.0)</td>
<td>18 (12.4)</td>
<td>0.710</td>
<td></td>
</tr>
</tbody>
</table>
Table 3: Percentages and p-values of satisfaction and dissatisfaction and received and desired esthetic treatments in the total sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Response n (%)</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No (n)</td>
<td>Yes (n)</td>
<td></td>
</tr>
<tr>
<td>Satisfaction with teeth color</td>
<td>189 (42)</td>
<td>261 (58)</td>
<td>0.376–0.390</td>
</tr>
<tr>
<td>Feeling teeth are crowded</td>
<td>308 (68.4)</td>
<td>142 (31.6)</td>
<td>0.203–0.390</td>
</tr>
<tr>
<td>Feeling teeth are poorly aligned</td>
<td>262 (58.2)</td>
<td>188 (41.8)</td>
<td>–0.030 to 0.088</td>
</tr>
<tr>
<td>Having dental caries</td>
<td>318 (70.7)</td>
<td>132 (29.3)</td>
<td>–0.080 to 0.015</td>
</tr>
<tr>
<td>Having non esthetic restoration</td>
<td>329 (73.1)</td>
<td>121 (26.9)</td>
<td>0.068–0.076</td>
</tr>
<tr>
<td>Hiding teeth during smiling</td>
<td>320 (71.1)</td>
<td>130 (28.9)</td>
<td>0.216–0.041</td>
</tr>
<tr>
<td>Received esthetic restorations</td>
<td>271 (60.2)</td>
<td>179 (39.8)</td>
<td>–0.036 to 0.083</td>
</tr>
<tr>
<td>Received orthodontic treatment</td>
<td>330 (73.3)</td>
<td>120 (26.7)</td>
<td>1.438–1.587</td>
</tr>
<tr>
<td>Received crowns or veneers</td>
<td>332 (73.8)</td>
<td>118 (26.2)</td>
<td>–0.652 to 0.030</td>
</tr>
<tr>
<td>Received whitening of teeth</td>
<td>304 (67.6)</td>
<td>146 (32.4)</td>
<td>0.061–0.216</td>
</tr>
<tr>
<td>Desire for whitening</td>
<td>201 (44.7)</td>
<td>249 (55.3)</td>
<td>–0.119 to 0.075</td>
</tr>
<tr>
<td>Desire for orthodontic treatment</td>
<td>288 (64)</td>
<td>160 (36)</td>
<td>0.238–0.700</td>
</tr>
<tr>
<td>Desire for crowns or veneers</td>
<td>300 (66.7)</td>
<td>150 (33.3)</td>
<td>–0.805 to 0.280</td>
</tr>
<tr>
<td>Desire for esthetic restorations</td>
<td>282 (62.7)</td>
<td>168 (37.3)</td>
<td>0.286–0.460</td>
</tr>
</tbody>
</table>

95% CI: 95% confidence interval; *Factor with a significant effect on general satisfaction with dental appearance (p ≤ 0.05); **Hiding teeth during smiling is a consequence of dissatisfaction not a cause of it

Table 4: Percentages and p-values of satisfaction and dissatisfaction and received and desired esthetic treatments among males and females

<table>
<thead>
<tr>
<th>Variable</th>
<th>Response n (%)</th>
<th>OR†(95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>No (n)</td>
<td>Yes (n)</td>
</tr>
<tr>
<td>Satisfaction with dental appearance</td>
<td>86 (28.9)</td>
<td>212 (71.1)</td>
<td>52 (22.8)</td>
</tr>
<tr>
<td>Satisfaction with teeth color</td>
<td>116 (38.9)</td>
<td>182 (61.1)</td>
<td>73 (35.3)</td>
</tr>
<tr>
<td>Feeling teeth are crowded</td>
<td>211 (70.8)</td>
<td>87 (29.2)</td>
<td>97 (44.7)</td>
</tr>
<tr>
<td>Feeling teeth are poorly aligned</td>
<td>174 (58.4)</td>
<td>124 (41.6)</td>
<td>88 (38.5)</td>
</tr>
<tr>
<td>Having dental caries</td>
<td>215 (72.1)</td>
<td>83 (27.9)</td>
<td>103 (44.8)</td>
</tr>
<tr>
<td>Having non esthetic restoration</td>
<td>229 (76.8)</td>
<td>69 (23.2)</td>
<td>100 (44.8)</td>
</tr>
<tr>
<td>Hiding teeth during smiling</td>
<td>220 (75.4)</td>
<td>78 (24.6)</td>
<td>100 (43.7)</td>
</tr>
<tr>
<td>Received esthetic restorations</td>
<td>192 (64.4)</td>
<td>106 (35.6)</td>
<td>79 (27.6)</td>
</tr>
<tr>
<td>Received orthodontic treatment</td>
<td>234 (74.4)</td>
<td>64 (25.6)</td>
<td>96 (41.0)</td>
</tr>
<tr>
<td>Received crowns or veneers</td>
<td>227 (76.2)</td>
<td>71 (23.8)</td>
<td>105 (43.3)</td>
</tr>
<tr>
<td>Received whitening of teeth</td>
<td>209 (70.1)</td>
<td>89 (29.9)</td>
<td>95 (43.0)</td>
</tr>
<tr>
<td>Desire for whitening</td>
<td>139 (46.6)</td>
<td>159 (53.4)</td>
<td>62 (46.8)</td>
</tr>
<tr>
<td>Desire for orthodontic treatment</td>
<td>229 (76.8)</td>
<td>69 (23.2)</td>
<td>59 (46.8)</td>
</tr>
<tr>
<td>Desire for crowns or veneers</td>
<td>210 (70.5)</td>
<td>88 (29.5)</td>
<td>90 (45.7)</td>
</tr>
<tr>
<td>Desire for esthetic restorations</td>
<td>197 (66.1)</td>
<td>101 (33.9)</td>
<td>85 (42.0)</td>
</tr>
</tbody>
</table>

The percentages were calculated relative to the total number of male and female subjects; 95% CI: 95% confidence interval; *Factor with a significant effect on general satisfaction with dental appearance (p ≤ 0.05); **Hiding teeth during smiling is a consequence of dissatisfaction not a cause of it; †Odds ratio
to other population, 76% in UK. This may be related to the fact that the perception of dental appearance may be affected by individual and cultural factors, and even it can be changed in the same population over time. Only 58% of the patients were satisfied with the color of their anterior teeth. This may be related to the findings that individuals may prefer white and shiny teeth rather than natural appearance, and patients tend to rate the shade of their teeth darker than the professional or the actual shade, which should be taken into consideration when selecting tooth shade for treatment purposes. The results of this study also showed that the patients’ general satisfaction with dental appearance was influenced significantly by anterior teeth color (p < 0.05, r = 0.561, r² = 0.315). The correlation illustrated in this study is consistent with that of previous studies that tooth color is a very important contributor in the general satisfaction with dental appearance. In addition, the patients’ general satisfaction with dental appearance was highly correlated with previously receiving whitening procedures, and whitening of teeth was the most desired treatment to improve dental aesthetics, which is consistent with the findings of other studies. This may be due to the increased interest in tooth whitening as a conservative approach for improvement of dental esthetics and the increase in their popularity either through professionally applied products or through over-the-counter products.

The most desired treatment to improve esthetics was tooth whitening, but theesthetic treatment with the significant effect was esthetic restorations and orthodontic treatment. This may be related to the findings that factors which significantly affected general satisfaction with dental esthetics were tooth color and crowding. Previous studies found that feeling of presence of poor tooth alignment was associated with patients satisfaction. In this study, anterior tooth crowding was significantly correlated with the general dissatisfaction with dental esthetics. This may be because tooth crowding is easily noticed by patients and can lead to unattractive appearance. It was also found that being embarrassed and hiding teeth during smiling was also significantly connected with patients’ satisfaction, which is considered as a drawback of dissatisfaction with dental appearance, which was also noticed by previous studies.

Data from previous studies regarding the correlation between sociodemographic factors and patients’ perception of dental esthetics were contradictory. While patients with a high level of education in some studies were found to be more satisfied with their dental esthetics, other studies did not find any correlation between the two factors, which is in agreement with the findings of this study. Patients’ satisfaction with dental esthetics was found to be age independent, which is also consistent with the findings of some previous studies. The correlation between gender and dental satisfaction was not clear in the previous studies and requires further exploration. When the sociodemographic factors were evaluated separately, it was found that there was no significant impact of patients’ gender on their general satisfaction with dental appearance. However, upon comparing the responses of male and female patients with the survey questions, female patients reported more dissatisfaction with dental esthetics, but there were no statistically significant differences. This finding is in agreement with Akarslan et al who found that although females were more dissatisfied with dental appearance than males, the difference was not significant. On the contrary, female patients significantly reported having more nonesthetic restorations and receiving more esthetic restorations. This may be because females are more critical in judging their dental appearance and women evaluate their dental appearance using different esthetic parameters. In addition, the desire for having esthetic treatment was significantly more in female than male patients, which reflects the increase in concerns and demands of female patients for dental esthetics. The finding of this study is in agreement with Tin-Oo et al who found that women expressed greater dissatisfaction with dental appearance and tooth color than men.

This study was a cross-sectional study that used a single unit measurement to evaluate patients’ general perception of dental appearance. Using this single measurement may have the advantage of being simple and useful in evaluating the overall perception of dental appearance, but it may hide other factors, as the demand for esthetic dentistry may be more complex and exceed conventional perceptions. Furthermore, all of the responses in this study were self-reported by the patients, and no attempts were made to correlate patients’ perceptions of dental appearance responses with their records or professional assessment to their problems and treatment needs, as the main aim of this study was to evaluate the patients’ personal satisfaction with dental appearance.

Future studies should determine how the dental profession and society might address the increased demand for esthetic dental treatment. Also, further studies are needed to include other factors that can affect esthetic perception such as emotional and personality factors and expand the survey population to different social and psychological backgrounds that represents the general population.
CONCLUSION

Satisfaction with dental appearance was affected by teeth color, feeling teeth are crowding, desire for esthetic restorations and orthodontic treatment. A high percentage of patients were not satisfied with the color of their teeth.

REFERENCES