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ORIGINAL RESEARCH

Aesthetic and Orthodontic Treatment Desires and Their Psychosocial Impact in Dental Students: A Questionnaire Study

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Purpose: The purpose of the study was to evaluate the desire for aesthetic and orthodontic treatments and their relationships with psychosocial impacts and other factors among dental students.

Patients and Methods: This cross-sectional study included 155 students from the College of Dentistry, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia. There were 65.2% of females and 34.8% of males with mean age of 21.33±1.52 years in the study. The participants completed demographic information, questions related to desire for aesthetic dental treatment including orthodontic treatment, and a validated Psychosocial Impact of Dental Aesthetics (PIDAQ) questionnaire. The PIDAQ questionnaire was used to evaluate the psychosocial impact of dental aesthetics and includes four subscales such as dental self-confidence, social impact, psychological impact, and aesthetic concern.

Results: Most participants (72%) desired aesthetic dental treatment. Teeth whitening (49%) was the most desired dental treatment, followed by orthodontic treatment (38.7%) and ceramic veneers (18.1%). The desire for aesthetic dental treatment was significantly associated with clinical years (P=0.042), knowledge of available esthetic treatment options (P=0.023), and attendance for routine dental care (P=0.028). The comparison of the PIDAQ scale scores showed that the participants with a desire for aesthetic treatment reported significantly lower dental self-confidence (P=0.018), and significantly greater social impact (P=0.049) and esthetic concern (P=0.006) than those without a desire for aesthetic treatment. Similarly, the participants desiring for orthodontic treatment showed significantly lower dental self-confidence (P<0.001) and significantly greater social impact (P=0.047), psychological impact (P=0.010), and aesthetic concern (P=0.019) than those who did not desire.

Conclusion: The study showed that most participants desired aesthetic dental treatment, and teeth whitening and orthodontic treatment being the most sought-after procedures. Knowledge of treatment options, routine dental care visits, and clinical years were associated with increased desire for aesthetic dental treatment. The desire for aesthetic and orthodontic treatments was significantly related to low dental self-confidence and higher social impact and aesthetic concern.

Keywords: orthodontics, dental aesthetic, social impact, psychological impact, self-confidence

Introduction

Dental aesthetics is one of the most valued aspects in facial appearance and is associated with improved psychosocial wellbeings.[1,2] It is not only limited to the cosmetic part of the teeth, but it also includes other aspects such as color, shape, and harmony of teeth in terms of alignment, as well as the overall presentation.[1,3] The perception of aesthetics/attractiveness is a subjective way of judging an individual's perception and is affected by factors such as age, gender, socioeconomic status, ethnicity, marital status, influence from family and friends, culture, and exposure to social media.[4] The literature shows that patients desire to receive bleaching of teeth, orthodontic treatment, crowns, and tooth-coloured

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restorations to improve their dental aesthetics.[5] Al-Zarea reported that patients with an increased desire for aesthetic dental treatment were dissatisfied with the appearance, color, alignment, and condition of their teeth.[6]

Malocclusion is considered one of the main reasons for seeking orthodontic treatment from early age of life.[7] The conventional methods that specialists use to determine whether orthodontic treatment is necessary are clinical examination, dental casts, radiographs, pictures, and occlusal indices, which are based on the ideal parameters and guidelines of occlusion and dental aesthetics. Consequently, psychosocial aspects are ignored even though orthodontic practitioners believe that they play an important role in patients' expectations of treatment outcomes.[8] Many orthodontic treatments are done for functional and health improvement. Patients with malocclusion experience changes in their social interaction and self-confidence.[4] Furthermore, an increase in the severity of malocclusion is associated with greater psychosocial impact of dental aesthetics.[9] It was reported that dental aesthetics was one of the main motivations for orthodontic treatment for patients, and they experienced greater social and psychological impacts due to malocclusion.[10] Additionally, patients who completed their orthodontic treatments perceived a significant reduction in psychological impact and aesthetic concern.[11]

Previous studies evaluated the psychological impact of dental aesthetics among university students in Nigeria,[12] India,[13] Pakistan,[14] and Spain.[15] In Riyadh, Saudi Arabia, university affiliation and field of study were found to significantly impact the self-perceived psychological impact of dental aesthetics among female university students.[16] El Mourad et al and El–Hejazi et al reported that teeth whitening and orthodontic treatments were the most desired aesthetic dental treatments among dental students in Riyadh, Saudi Arabia.[17,18]

It is important to understand the desire for aesthetic and orthodontic treatments among dental students. However, there is a lack of evidence regarding the desire for aesthetic dental treatments and the psychosocial impact of dental aesthetics among dental students in the eastern province of Saudi Arabia. An accurate assessment of the desire for aesthetic dental treatment and associated factors can help understand the broader implications of oral health among dental students. It was hypothesized that students with greater aesthetic and orthodontic treatment desires will perceive more social and psychological impacts, low self-confidence, and increased aesthetic concern. Therefore, the study aimed to evaluate the desire for aesthetic treatment and its relationship with the psychosocial impact of dental aesthetics and other factors among dental students.

Materials and Methods

Study Design and Participants

This questionnaire-based cross-sectional study included male and female students enrolled at the College of Dentistry, Imam Abdulrahman Bin Faisal University (IAU), Dammam, Saudi Arabia. The dentistry program at IAU spans over six years. In the first year, students complete basic science and other courses in the university's preparatory year program. Starting in the second year, they begin preclinical dental courses at the College of Dentistry. Therefore, the researchers invited all dental students from the second year to the sixth year at the college to participate in the study. The students with current or prior orthodontic treatment, cleft lip, or craniofacial syndromes were excluded from the study. The students were eligible to participate in the study if they agreed to voluntary participation in the study and provided written informed consent. The hard copies of questionnaires were administered among dental students in their classrooms, clinics, and other places in the college. Data collection was completed during October and November 2024.

Study Instrument

A structured questionnaire was used to collect data, which was divided into three sections. The first section included demographic data: age, gender, class year, and monthly family income. In the second section, questions were used to measure the desire for aesthetic dental treatment, which were based on previous studies conducted on dental and other university students in Saudi Arabia.[6,17,18] The third section included a validated Psychosocial Impact of Dental Aesthetics (PIDAQ) questionnaire (Supplementary File). The PIDAQ was developed by Klages et al to evaluate the psychosocial impact of dental aesthetics on individuals. It focuses on how individuals perceive and are affected by the appearance of their teeth and smile.[19]

The PIDAQ is a 23-item psychometric scale that has four subscales, such as dental self-confidence, social impact, psychological impact, and aesthetic concern. The dental self-confidence subscale includes six questions, social impact eight questions, psychological impact six questions, and aesthetic concern three questions. The dental self-confidence domain indicates that the emotional condition of an individual is impacted by dental aesthetics. Social impact pertains to social problems faced by an individual's awareness of his/her discouraging dental appearance. Psychological impact deals with an individual's feelings of inferiority and sadness when interacting with people with better dental aesthetics. Aesthetic concern refers to an individual's dissatisfaction with his/her dental appearance when looking at mirrors, photographs, or videos.[14]

A 5-point Likert scale is used for each item of the PIDAQ and a higher score of an item indicates greater influence on quality of life, and a score of 0 shows no impact at all.[19] This scale is proven to be reliable and valid in young Arab adults in Saudi Arabia.[4] The present study calculated reliability statistics for PIDAQ and its subscales and Cronbach's alpha values are as follows: dental self-confidence (0.957), social impact (0.952), psychological impact (0.931), aesthetic concern (0.941), and PIDAQ (0.917). These statistics show that the instrument demonstrates good internal consistency or reliability.

Ethics

This study is part of the project that was approved (IRB-2024-02-254) on 25/03/2024 from the Institutional Review Board of the Deanship of Scientific Research at IAU. A written consent form was obtained from all students who completed the self-administered questionnaire. The participants were assured of the privacy and confidentiality of their responses. The researcher provided explanations if participants had any questions about the items in the questionnaire. The study was conducted in accordance with the guidelines of the Declaration of Helsinki.

Statistical Analysis

Statistical Package for Social Sciences (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp) was used for statistical analysis. Descriptive statistics included means, standard deviation, frequencies, and percentages for study variables. Cronbach's alpha (α) was calculated to evaluate the internal consistency of PIDAQ. A Chi-square test was performed to evaluate the association between the desire for aesthetic dental treatment and demographic variables, knowledge of aesthetic treatment options, and dental attendance for routine dental care. Shapiro–Wilk Test was performed to test normal distribution of PIDAQ subscales. As a result, the independent samples *t*-test was used to compare the scores of subscales of the PIDAQ questionnaire between participants with and without desire for aesthetic dental treatment. A *P* value of 0.05 or less was considered statistically significant.

Results

The study included 155 dental students with 65.2% of females and 34.8% of males. The mean age of participants was 21.33±1.52 years. The majority of participants (72.3%) were clinical year students and had knowledge of the available aesthetic treatment options (81.3%). About 44.6% of participants belonged to high income group and only 37.4% of the sample regularly visited dental office for routine dental care (Table 1).

Most participants (72%) desired aesthetic dental treatment. Teeth whitening (49%) was the most desired dental treatment, and this was followed by orthodontic treatment (38.7%) and ceramic veneers (18.1%) (Figure 1). A greater proportion of females (69.6%) compared to males (30.4%) desired aesthetic dental treatment, but differences were not statistically significant (P=0.059). Similarly, no statistically significant differences were observed among participants with different levels of monthly family income (P=0.466). The participants from clinical years were 2.16 times more likely to desire for aesthetic dental treatment (P=0.042) than pre-clinical years students. Similarly, the knowledge of the available aesthetic treatment options (OR=2.6, P=0.023) and dental attendance for routine dental care (OR=2.21, P=0.028) was significantly associated with increased odds of desire for aesthetic dental treatment (Table 2).

Regarding the PIDAQ questionnaire, the mean scores were 17.54 for dental self-confidence, 7.54 for social impact, 7.82 for psychological impact, and 2.61 for aesthetic concern (Figure 2). The comparison of the PIDAQ subscale scores showed that the participants with a desire for aesthetic treatment reported significantly lower dental self-confidence

Table 1 Demographic and Other Factors of Participants

Study Variables	Frequency (%)
Gender	
Male	54 (34.8)
Female	101 (65.2)
Academic year	
Pre-clinical year	43 (27.7)
Clinical year	112 (72.3)
Monthly family income:	
Low	9 (5.8)
Middle	74 (47.7)
High	72 (46.5)
Knowledge of the available aesthetic treatment options	
Yes	126 (81.3)
No	29 (18.7)
Dental Attendance for routine dental care	
Yes	58 (37.4)
No	97 (62.6)

(P=0.018), and significantly greater social impact (P=0.049) and aesthetic concern (P=0.006) than those without a desire for aesthetic treatment (Table 3). The study showed that the desire for teeth whitening treatment was not significantly related to subscales of PIDAQ. The participants desiring for orthodontic treatment showed significantly lower dental self-confidence (P<0.001), and significantly greater social impact (P=0.047), psychological impact (P=0.010), and aesthetic concern (P=0.019) than those who did not desire for orthodontic treatment (Table 4).

Discussion

The present study found that the desire for dental aesthetic treatment was common in dental students, and teeth whitening and orthodontic treatment were the most frequently desired aesthetic treatments. These results are in accordance with the statistics available from other studies conducted on dental students in Riyadh, Saudi Arabia.[17,18,20] In addition, similar

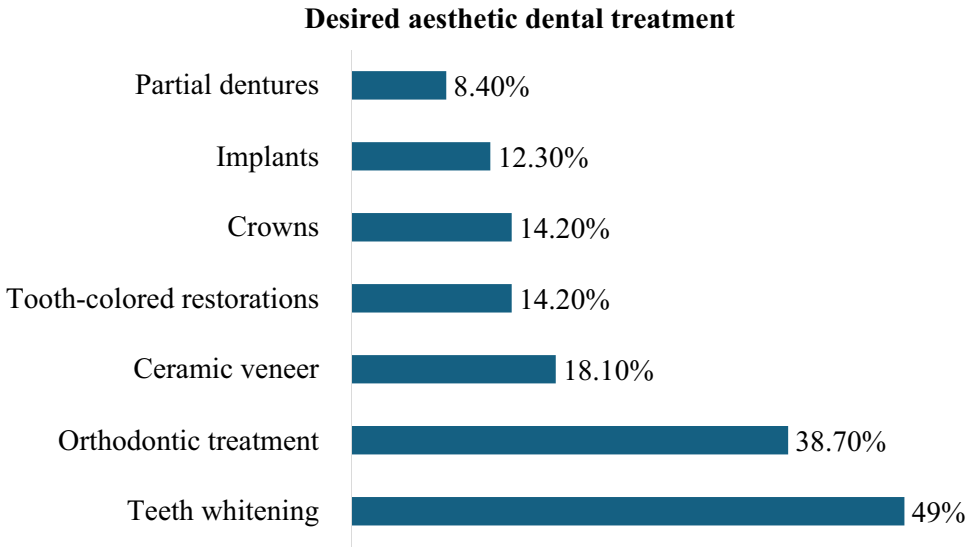

Figure 1 Participants' responses about the desired aesthetic dental treatment.

Table 2 Desire for Aesthetic Treatment and Its Relationship with Demographic and Other Factors Among Participants

Study Variables	Desire for Aesthetic Dental Treatment Frequency (%)	Odds Ratio	P-value
Gender			
Male	34 (30.4)	1.99	0.059
Female	78 (69.6)		
Academic year			
Pre-clinical years	26 (23.2)	2.16	0.042*
Clinical years	86 (76.8)		
Monthly family income:			
Low/Middle	62 (55.4)	0.77	0.466
High	50 (44.6)		
Knowledge of the available aesthetic treatment options			
Yes	96 (85.7)	2.6	0.023*
No	16 (14.3)		
Dental Attendance for routine dental care			
Yes	76 (67.9)	2.21	0.028*
No	36 (32.1)		

Note: *Statistically significant.

findings were revealed in a sample of students at Al-Jouf University, Saudi Arabia where teeth whitening (80.9%) and orthodontic treatment (51.8%) were found to be the most commonly desired procedures to improve dental aesthetics.[6] Another study of university students in Riyadh showed teeth whitening (82%) as the most needed dental treatment.[21] Having white and aligned teeth greatly contributes to attractive facial appearance, which may account for most students desiring for aesthetic dental treatment.[20]

Similar trends of desire for aesthetic treatment were observed in the studies of adult patients conducted locally and internationally. Most patients attending public dental clinics in Abha city of Saudi Arabia desired whitening of teeth (73.8%) and this was followed by orthodontic treatment (56%).[22] In Nigeria, 82.8% of patients wished to receive

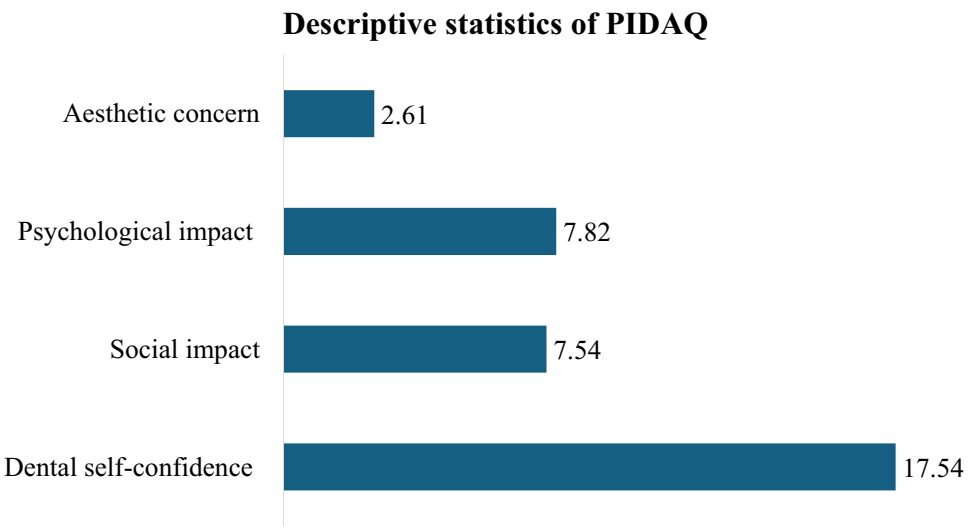

Figure 2 Descriptive statistics of subscales of PIDAQ among study participants.

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Table 3 Desire for Aesthetic Treatment and Its Relationship with PIDAQ Scale Among Participants

PIDAQ Scale	Desire for Aesthetic Dental Treatment Mean±SD	No Desire for Aesthetic Dental Treatment Mean±SD	P-value
Dental Self-confidence	16.87±6.05	19.30±4.60	0.018*
Social Impact	8.37± 8.29	5.37±8.81	0.049*
Psychological Impact	8.34±6.45	6.46±7.12	0.118
Aesthetic Concern	3.04±3.26	1.46±2.84	0.006*

Note: *Statistically significant.
Abbreviation: SD, Standard Deviation.

Table 4 Desire for Teeth Whitening and Orthodontic Treatment and Their Relationships with PIDAQ Scale Among Participants

PIDAQ Scales	Desire for Teeth Whitening Treatment Mean±SD	No Desire for Tooth Whitening Treatment Mean±SD	P-value
Dental Self-confidence	16.88±6.39	18.18±5.08	0.164
Social Impact	7.77±8.39	7.32±8.68	0.738
Psychological Impact	8.38±6.29	7.28±7.02	0.305
Esthetic Concern	2.95±3.02	2.28±3.39	0.197
	Desire for Orthodontic Treatment Mean±SD	**No desire for Orthodontic Treatment Mean±SD**	**P-value**
Dental Self-confidence	14.65±5.97	19.37± 4.85	<0.001*
Social Impact	9.25±8.44	6.46±8.43	0.047*
Psychological Impact	9.55±6.63	6.72±6.50	0.010*
Esthetic Concern	3.37±3.38	2.12 ±3.03	0.019*

Note: *Statistically significant.
Abbreviation: SD, Standard Deviation.

aesthetic treatment and teeth whitening was the most desired procedure.[23] Similarly, tooth whitening was the most desired treatment (48.1%) among adult patients in Malaysia[24] and Turkey.[25]

Female students are more aware and concerned about dental esthetics and are more motivated to desire for aesthetic treatment compared to male counterparts due to the significant impact of psychosocial factors.[17,26] This is in line with the findings of the current study where a greater proportion of female students desired for aesthetic treatment than male students. The study also showed that students in clinical years and those with knowledge of aesthetic treatment options were twice as likely to desire for aesthetic treatment than those in preclinical years and without the knowledge of aesthetic treatment options. The students in clinical years are more aware of dental aesthetics due to their exposure to patient care, clinical experience, and first-hand knowledge of aesthetic procedures, whereas pre-clinical years students focus on learning fundamental concepts in basic dental science courses. Similarly, the observed relationship between knowledge of aesthetic treatment options and increased desire for aesthetic treatment was expected as increased knowledge of aesthetic procedures is likely to enhance the desire for treatment.

Socioeconomic factors play an important role in determining dental insurance coverage, the affordability of dental treatment, and utilization of dental services, and individuals with high income are known to visit dental offices more frequently than those with low income.[27,28] It was reported that economic disadvantage is associated with dissatisfaction with dental appearance and hence increased desire for aesthetic treatment.[6,29] However, the family income did not significantly influence the desire for aesthetic dental treatment in our sample of dental students. These findings are similar to the results shown by a recent study by Campos et al, where monthly income was not significantly related to the demand for aesthetic dental treatment among individuals in Finland.[30]

The individuals who visit dental office for routine dental care are known to exhibit more daily tooth brushing, reduced soft drinks consumption, early diagnosis of oral problems, reduced dental pain, caries, and tooth loss, and better oral health, and improved oral health related quality of life.[31–33] According to the present study, a significantly greater desire for aesthetic treatment was observed among students who regularly visit dental office for routine dental care compared to those who did not receive routine dental treatment. This increased desire for aesthetic treatment can be attributed to knowledge and awareness received in dental settings about the prevention of oral problems and availability of treatment choices including aesthetic procedures.[34] These study findings underline the importance of performing routine dental visits in relation to desired dental aesthetic treatments and dental professionals should play a crucial role in providing necessary aesthetic treatment to reduce psychological and social impacts and increase self-confidence in addition to improving oral health.

In the present study, the participants with a desire for aesthetic dental treatments perceived significantly lower self-confidence, and significantly higher social impact and aesthetic concern. These findings highlight how desire for aesthetic treatment can be driven not only by physical appearance but also by self-confidence and social wellbeing. The perception of poor dental aesthetics in a social context and how an individual is judged in social interactions and accepted in social circles may account for high social impact, hence driving participants to desire for aesthetic dental treatment. It is known that malocclusion is significantly associated with the aesthetic concern domain of PIDAQ.[35] Therefore, it is possible that a high score related to aesthetic concern is due to malocclusion, which might have led to the increased desire for aesthetic dental treatment observed in our study.

Onyeaso et al found that more than 40% of subjects felt less confident due to malocclusion and they avoided making social interaction and laughing in public.[36] According to a study by Nazir et al, dental students who report the need for orthodontic treatment perceived significantly greater social impact and aesthetic concern and lower self-confidence.[14] A study of Chinese undergraduate students by Yi et al, found significant correlations between desire for orthodontic treatment and scores of PIDAQ subscales.[26] These results confirm the findings of the present study where psychological impact, social impact, and aesthetic concern were higher and self-confidence was lower among dental students desiring for orthodontic treatment compared to those without a desire for orthodontic treatment. On the other hand, Garg et al evaluated the effect of one year of orthodontic treatment on PIDAQ scores, and found significant reduction in psychological impact, social impact, aesthetic concern and improvement in self-confidence.[37] Klages et al observed better plaque control and adherence to oral hygiene among patients with previous orthodontic treatments.[38] The present study highlights the importance of understanding the psychosocial effects associated with the desire for orthodontic treatment in order to provide patient-centered treatment for malocclusion.

The use of validated and standardized questionnaire and inferential statistical analysis of data in the present study provided new and reliable evidence about the desire for aesthetic dental and orthodontic treatment and their psychosocial impact among dental students. However, there are limitations to the study which should be considered. The data were collected from a dental college in the eastern province of Saudi Arabia, which limits the generalizability of study findings to dental students in other geographic locations. The participants may not precisely answer every question on the questionnaire, rendering measurement biases in the study. The cross-sectional study design is limited in examining cause-and-effect linkages. Moreover, the study evaluated the influence of demographic factors, dental attendance, and knowledge of aesthetic treatment choices on desire for aesthetic treatment. However, it will be interesting to explore how social norms, culture, the influence of family and friends, and the use of social media affect the desire to improve dental aesthetic.

Conclusion

According to this study, most dental students desired for aesthetic and orthodontic treatments. Knowledge of treatment options, routine dental care visits, and clinical years were associated with an increased desire for aesthetic dental treatment. The participants with a desire for dental aesthetic perceived low dental self-confidence and higher social impact and aesthetic concern. Similarly, the participants with a desire for orthodontic treatment demonstrated low dental self-confidence, greater social and psychological impacts, and aesthetic concern. Dental professionals should consider the psychological and social factors influencing the desire for aesthetic treatments, provide personalized treatment plans, and educate about the emotional benefits of aesthetic dental care.

Disclosure

The authors report no conflicts of interest in this work.

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