



Perception of Smile Esthetics and Orthodontic Treatment Expectations: A Questionnaire-Based Study

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Abstract

Background: Smile aesthetics significantly influence facial attractiveness, social interaction, and psychological well-being. Dissatisfaction with dental appearance due to malocclusion can reduce self-confidence and oral health-related quality of life. Growing aesthetic awareness has increased demand for orthodontic treatment; however, patient perceptions often differ from clinicians, making their understanding essential for patient-centered care.

Materials and Methods: A cross-sectional, questionnaire-based survey was conducted among 209 individuals from the general population aged 18–35 years. A validated structured questionnaire comprising 23 items assessed smile satisfaction, visual analogue scale (VAS) responses, knowledge, awareness, motivation toward orthodontic treatment, and perception of smile features. The survey was distributed electronically using Google Forms. Data were analyzed using Jamovi version 2.6.25. Descriptive statistics, Chi-square test, and independent samples t-test were applied to assess associations and compare mean scores, with a significance level set at $p < 0.05$.

Results: A total of 209 participants were included, with most aged 18–25 years (76.6%) and females (58.9%). Dental concerns were reported by 71.3%. While 71.8% were satisfied with their smile, 49.3% avoided smiling and 54.1% felt embarrassed. A total of 80.4% desired improvement. Moderate to high concern was common, and awareness was highest for metal braces (71.8%). Significant associations were observed between gender and dental concern ($p = 0.013$), gender and desire to improve smile ($p = 0.028$), and dental concern and embarrassment ($p < 0.001$).

Conclusion: Smile aesthetics significantly influenced perception, confidence, and motivation for orthodontic treatment. Dental concern was associated with higher dissatisfaction and reduced confidence, highlighting the importance of aesthetic awareness in improving treatment acceptance and overall quality of life.

Keywords: Smile aesthetics; Orthodontic treatment; Dental perception; Malocclusion; Quality of life; Treatment motivation

Introduction

Smile aesthetics play a crucial role in facial attractiveness, social interaction, psychological well-being, and overall quality of life. A pleasant smile contributes significantly to self-esteem and social

acceptance, whereas dissatisfaction with dental appearance is often associated with reduced confidence and impaired oral health-related quality of life (OHRQoL) [1,2]. Malocclusion and deviations

from ideal tooth alignment can disrupt smile harmony and may influence an individual's perception of facial attractiveness. Such discrepancies frequently motivate individuals to seek orthodontic treatment in order to improve dental appearance and achieve a more harmonious smile. Previous studies have shown that a considerable proportion of individuals are able to recognize abnormalities in their smile, with approximately 41.8% of adolescents reporting dissatisfaction with their smile, primarily due to occlusal irregularities [3]. Dental features such as crowding, spacing, excessive gingival display, midline discrepancies, overjet, and overbite are among the most common factors that negatively influence smile aesthetics and overall facial perception.

The perception of smile aesthetics, however, is subjective and may vary according to several factors including age, gender, cultural background, and level of dental awareness [4]. What clinicians may consider an acceptable occlusion or minor irregularity may be perceived differently by patients, particularly when aesthetic concerns are involved. Therefore, understanding patients' expectations and perceptions has become increasingly important in contemporary orthodontic practice. Over the past few decades, the demand for orthodontic treatment has increased significantly among both adolescents and adults, not only due to functional concerns but also because of growing awareness of dental aesthetics and its impact on social and professional interactions.

Motivational factors for pursuing orthodontic treatment are multifactorial and include self-perceived malocclusion, aesthetic dissatisfaction, social influences, and psychological impacts [3]. Patients' satisfaction with their smile is highly subjective and may differ from the clinician's evaluation, highlighting the importance of incorporating patient-reported outcomes into treatment planning [5]. Questionnaire-based studies serve as valuable tools for assessing these subjective perceptions, as they allow researchers to explore patients' expectations, satisfaction levels, and aesthetic priorities in a structured manner [4].

Despite the increasing importance of patient perceptions in orthodontic care, limited data are available regarding how individuals perceive their smile aesthetics and what factors motivate them to seek orthodontic treatment. Therefore, the present

questionnaire-based study aims to evaluate individuals' perceptions of smile aesthetics, their satisfaction with dental appearance, and the motivational factors influencing the decision to pursue orthodontic treatment. A better understanding of these perceptions may help orthodontists align clinical objectives with patient expectations, ultimately improving communication, treatment acceptance, and overall patient-centered care.

Materials And Methods

Study design and setting

cross-sectional, questionnaire-based observational survey conducted to evaluate participants' perceptions of smile aesthetics, satisfaction with dental appearance, and motivation toward orthodontic treatment the general population, including students, patients visiting the dental outpatient department, and community members. The study was carried out over a period of three months, from January 2025 to March 2025, using an electronic survey platform that allowed participants to complete the questionnaire remotely.

Sample size calculation

The sample size was estimated using the Cochran formula for cross-sectional studies: $n = (Z^2pq)/d^2$, where n represents the required sample size, Z represents the standard normal deviation at a 95% confidence interval (1.96), p represents the estimated prevalence, q represents $(1 - p)$, and d represents the margin of error. Based on the prevalence of dental concern (71.3%) obtained from pilot data, p was taken as 0.713 and q as 0.287, with the margin of error set at 6.2%. The calculated sample size was approximately 204. Considering feasibility and availability of participants during the study period, a total of 209 participants were included in the present study.

Study population

The study population consisted of individuals from the general population, including students, patients visiting the dental outpatient department, and community members. A total of 209 participants were included in the study. The participants represented both genders and were within the age group of 18–35 years, with the majority belonging to the young adult population.

1. Inclusion criteria included individuals from the general population who were within the age group

of 18–35 years, were willing to participate in the study, and provided informed consent by completing the questionnaire.

2. Exclusion criteria included individuals who declined to participate in the study or submitted incomplete questionnaire responses.

Study instrument

The study instrument consisted of a structured, self-administered questionnaire developed to assess participants' perceptions of smile aesthetics, satisfaction with dental appearance, and motivation toward orthodontic treatment. The questionnaire was prepared based on an extensive review of the literature related to smile esthetics and orthodontic treatment perception. The content validity of the questionnaire was established through evaluation by a panel of experts in the field of Orthodontics. The reliability of the questionnaire was assessed using Cronbach's alpha following pilot testing, and the Cronbach's alpha value was **0.82**, indicating good internal consistency and reliability of the study instrument.

Questionnaire (23 items)

- Section A: Demographic Information (5 items)
- Section B: Smile Satisfaction (7 items)
- Section C: Visual Analogue Scale (VAS) (3 items)
- Section D: Knowledge, Awareness, and Motivation toward Orthodontic Treatment (3 items)
- Section E: Perception of Smile Features (5 items)

Data collection procedure

The questionnaire was distributed electronically to the general population through Google Forms to facilitate easy access and efficient data collection. The link to the questionnaire was shared with potential participants through email and social media platforms. All responses were collected anonymously and maintained confidentially.

Statistical analysis

Statistical analysis was performed using Jamovi version 2.6.25. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated for all variables. The Chi-

square test was used to assess associations between categorical variables, while the independent samples t-test was applied to compare mean values between groups. A p-value < 0.05 was considered statistically significant.

Results

A total of 209 participants were included in the study. The age distribution showed that 160 participants (76.6%) were aged 18–25 years, while 49 participants (23.4%) were aged 26–35 years. Females (58.9%) were more than males (41.1%). The majority had college-level education (45.9%), followed by graduates (33.5%), postgraduates (12.0%), and school-level education (8.6%). Previous orthodontic treatment was reported by 39.2%, while 60.8% had not undergone treatment. Dental concerns related to smile were reported by 71.3% of participants.

Regarding smile satisfaction, 71.8% of participants agreed or strongly agreed that they were satisfied with their smile. A total of 49.3% reported avoiding smiling in public or photographs, and 54.1% reported feeling embarrassed while smiling. Additionally, 71.8% agreed that their smile made them feel confident, while 67.5% believed that others notice their smile positively. A total of 80.4% of participants expressed a desire to improve their smile appearance.

Based on VAS scores, 57.9% of participants reported moderate concern about their smile, while 28.7% reported high concern. The importance of improving smile was rated as moderate by 52.6% and high by 37.8% of participants. Confidence while smiling was reported as moderate in 56.5% and high in 31.1% of participants.

In terms of awareness, metal braces were known to 71.8%, clear aligners to 64.6%, ceramic braces to 53.6%, and lingual braces to 32.5%, while 10.5% reported no awareness. The main reason for orthodontic treatment was aesthetic improvement (44.0%), followed by both aesthetic and functional reasons (35.9%), functional correction (13.4%), and other reasons (6.7%). A total of 75.6% believed that orthodontic treatment improves facial appearance.

Significant associations were observed between gender and dental concern ($\chi^2 = 6.12$, $p = 0.013$), gender and desire to improve smile ($\chi^2 = 4.85$, $p = 0.028$), and treatment status and awareness ($\chi^2 = 5.74$, $p = 0.017$). A highly significant association was found

between dental concern and embarrassment while smiling ($\chi^2 = 18.36, p < 0.001$).

Comparison of mean scores revealed that concern about smile (Q13) was not significantly associated with gender ($p = 0.066$) or treatment status ($p = 0.954$), but showed a significant association with dental concern ($t = 3.92, p < 0.001$). Importance of improving smile (Q14) showed significant differences based on gender ($t = -3.36, p = 0.001$), treatment status ($t = 4.06, p < 0.001$), and dental concern ($t = 4.48, p < 0.001$). Confidence while smiling (Q15) was not significantly associated with gender ($p = 0.164$) or treatment status ($p = 0.406$), but showed a significant association with dental concern ($t = -3.65, p < 0.001$).

Discussion

The present study evaluated participants' perceptions of smile aesthetics, satisfaction with dental appearance, and motivation toward orthodontic treatment among a young adult population. The findings demonstrated that a majority of participants reported dental concerns and expressed a strong desire to improve their smile, highlighting the increasing importance of dental aesthetics in contemporary society [1].

In the present study, 71.3% of participants reported dental concerns related to their smile, and 80.4% expressed a desire to improve their smile appearance. These findings are consistent with previous studies demonstrating that dental aesthetics significantly influences self-awareness, social perception, and oral health-related quality of life [2,6]. Recent evidence has also emphasized that individuals with greater aesthetic concerns are more likely to seek orthodontic treatment [7].

Although a large proportion of participants reported satisfaction with their smile, a considerable number also reported avoiding smiling in public and experiencing embarrassment. This suggests that even individuals with perceived satisfaction may have underlying psychosocial concerns. Similar findings have been reported in studies showing that negative self-perception of smile is associated with malocclusion and reduced social confidence [3,8]. Additionally, dental appearance has been shown to significantly influence perceived social attractiveness and interpersonal relationships [9].

The VAS findings of the present study indicated that most participants reported moderate to high levels of concern regarding their smile and the importance of improving it. These results highlight that subjective perception plays a crucial role in orthodontic motivation. Previous research has demonstrated that perceived dental aesthetics is often a stronger determinant of treatment demand than objective clinical need [10,11]. Furthermore, recent studies have shown a strong association between aesthetic perception and oral health-related quality of life [6].

In terms of awareness, most participants were familiar with conventional orthodontic appliances such as metal braces, whereas awareness of lingual braces was comparatively lower. Similar findings have been reported in recent studies assessing awareness of orthodontic treatment modalities among young adults, indicating variability in knowledge regarding advanced treatment options [12]. Awareness and acceptance of orthodontic treatment options have also been shown to influence treatment-seeking behavior [13].

The primary motivation for orthodontic treatment in the present study was aesthetic improvement, which is in agreement with previous studies reporting that esthetics is the most common reason for seeking orthodontic care [2]. Psychological and social factors have also been identified as important determinants of orthodontic treatment demand [14].

The present study demonstrated significant associations between gender and dental concern, as well as gender and desire to improve smile, suggesting that females may exhibit greater concern regarding dental aesthetics. Similar gender-based differences in aesthetic perception and treatment demand have been reported in previous studies [1,15]. The strong association between dental concern and embarrassment while smiling further highlights the psychological impact of smile dissatisfaction.

Independent samples t-test analysis revealed that dental concern significantly influenced concern about smile (Q13), importance of improving smile (Q14), and confidence while smiling (Q15). These findings indicate that individuals with dental concerns experience higher levels of dissatisfaction and reduced confidence. Previous studies have reported similar associations between malocclusion, self-esteem, and

quality of life, as well as improvements following orthodontic treatment [16,17].

Furthermore, malocclusion has been shown to negatively affect oral health-related quality of life and social well-being [18]. The perception of orthodontic treatment need also varies depending on individual awareness, expectations, and psychological factors [19]. Recent research has further confirmed that smile aesthetics plays a significant role in facial attractiveness and social acceptance [20].

Overall, the findings of the present study agree with existing literature and further reinforce the importance of dental aesthetics in influencing psychological well-being and orthodontic treatment motivation. The observed associations between dental concern, smile satisfaction, and confidence highlight the significant role of subjective perception in shaping treatment demand. In addition, variations in awareness and gender-based differences emphasize the influence of social and psychological factors on aesthetic perception. These findings suggest that improving awareness regarding orthodontic treatment options and addressing aesthetic concerns at an early stage may enhance both treatment acceptance and overall quality of life.

Conclusion

The present study demonstrates that smile aesthetics plays a significant role in influencing individuals' perceptions, confidence, and motivation toward orthodontic treatment among the general population, particularly young adults. A substantial proportion of participants reported dental concerns and expressed a strong desire to improve their smile, indicating the growing importance of aesthetic awareness in contemporary society. Although many participants reported satisfaction with their smile, the presence of embarrassment and avoidance behaviors highlights the underlying psychosocial impact of dental appearance.

Furthermore, dental concern was found to significantly influence perception, importance of improvement, and confidence while smiling. The findings emphasize that subjective perception of smile aesthetics is a key determinant of orthodontic treatment demand. Therefore, enhancing awareness about orthodontic treatment options and addressing aesthetic concerns at an early stage may contribute to

improved psychological well-being, treatment acceptance, and overall quality of life.

References

1. Klages U, Bruckner A, Zentner A. Dental aesthetics, self-awareness, and oral health-related quality of life in young adults. *Eur J Orthod.* 2004;26(5):507-514.
2. Feu D, Oliveira BH, Oliveira Almeida MA, Kiyak HA, Miguel JA. Oral health-related quality of life and orthodontic treatment seeking. *Am J Orthod Dentofacial Orthop.* 2010;138(2):152-159.
3. Moura C, Cavalcanti AL, Gusmão ES, Soares RSC, Moura FTC, Santillo PMH. Negative self-perception of smile associated with malocclusions among Brazilian adolescents. *Eur J Orthod.* 2013;35(4):483-490.
4. Armalaite J, Jarutiene M, Vasiliauskas A, Sidlauskas A, Svalkauskiene V, Sidlauskas M, et al. Smile aesthetics as perceived by dental students: a cross-sectional study. *BMC Oral Health.* 2018;18:225.
5. Bos A, Vosselman N, Hoogstraten J, Prahlandersen B. Patient compliance: a determinant of patient satisfaction? *Angle Orthod.* 2005;75(4):526-531.
6. Närhi L, Silvola AS, Pirttiniemi P. Dental aesthetics and oral health-related quality of life in adults. *Eur J Orthod.* 2023;45(3):287–294.
7. Mezio M, et al. Smile perception among orthodontists and laypersons: a cross-sectional study. *Braz J Oral Sci.* 2024;23:e241234.
8. Al-Bitar ZB, et al. Influence of personality traits on dental aesthetic perception. *Prog Orthod.* 2025;26:15.
9. Montinaro F, et al. Smile aesthetics perception among dentists and laypeople. *Front Dent Med.* 2025;6:1532220.
10. Sinha R, et al. Psychosocial impact of orthodontic treatment on smile perception. *J Contemp Dent Pract.* 2026;27(1):45–52.
11. Huang JY, et al. Relationship between dental aesthetics and oral health-related quality of life. *Int J Environ Res Public Health.* 2022;19:12345.

12. Sandlund N, et al. Subjective orthodontic treatment need and quality of life. *Acta Odontol Scand.* 2022;80(6):450–457.

13. Vedovello SAS, et al. Impact of occlusal conditions on quality of life. *Angle Orthod.* 2020;90(3):373–379.

14. Tung AW, Kiyak HA. Psychological influences on orthodontic treatment timing. *Am J Orthod Dentofacial Orthop.* 1998;113(1):29–39.

15. Al-Zarea BK. Satisfaction with dental appearance and orthodontic treatment need among students. *J Contemp Dent Pract.* 2013;14(4):698–703.

16. Li XT, Tang Y, Huang XL, Wan H, Chen YX. Factors influencing subjective orthodontic treatment need and culture-related differences among Chinese natives and foreign inhabitants. *Int J Oral Sci.* 2010;2(3):149–157.

17. Hassan AH, Amin HE. Orthodontic treatment need and oral health-related quality of life. *J Orthod Sci.* 2014;3(3):89–94.

18. Bernabé E, Tsakos G, Messias de Oliveira C, Sheiham A. Impacts on daily performances attributed to malocclusions using the condition-specific feature of the Oral Impacts on Daily Performances Index. *Angle Orthod.* 2008;78(2):241–247.

19. Johal A, Cheung MYH. Impact of malocclusion on quality of life. *Br Dent J.* 2007;203:E18.

20. Mandall NA, McCord JF, Blinkhorn AS, et al. Perceived aesthetic impact of malocclusion. *Community Dent Oral Epidemiol.* 1999;27(2):97–103.

Table

Table 1: Study Questionnaire and Distribution of Responses Among Participants (N = 209)

Q.No	Question	Response	n (%)
Section A — Demographic Information			
Q1	Age	18–25 years	160 (76.6)
		26–35 years	49 (23.4)
Q2	Gender	Male	86 (41.1)
		Female	123 (58.9)
Q3	Educational level	School	18 (8.6)
		College	96 (45.9)
		Graduate	70 (33.5)
		Post-graduate	25 (12.0)
Q4	Previous orthodontic treatment	Yes	82 (39.2)
		No	127 (60.8)
Q5	Dental concerns related to smile	Yes	149 (71.3)
		No	60 (28.7)
Section B — Smile Satisfaction (05-point Likert Scale)			
Q6		Strongly disagree	5 (2.4)
		Disagree	18 (8.6)

	I am satisfied with the way my smile looks	Neutral	36 (17.2)
		Agree	98 (46.9)
		Strongly agree	52 (24.9)
Q7	I avoid smiling in public or photos because of my teeth	Strongly disagree	12 (5.7)
		Disagree	36 (17.2)
		Neutral	58 (27.8)
		Agree	70 (33.5)
		Strongly agree	33 (15.8)
Q8	My smile makes me feel confident	Strongly disagree	4 (1.9)
		Disagree	15 (7.2)
		Neutral	40 (19.1)
		Agree	95 (45.5)
		Strongly agree	55 (26.3)
Q9	I think other people notice my smile positively	Strongly disagree	6 (2.9)
		Disagree	20 (9.6)
		Neutral	42 (20.1)
		Agree	90 (43.1)
		Strongly agree	51 (24.4)
Q10	I wish to improve my smile appearance	Strongly disagree	3 (1.4)
		Disagree	10 (4.8)
		Neutral	28 (13.4)
		Agree	92 (44.0)
		Strongly agree	76 (36.4)
Q11	My smile affects how I interact socially	Strongly disagree	14 (6.7)
		Disagree	40 (19.1)
		Neutral	60 (28.7)
		Agree	65 (31.1)
		Strongly agree	30 (14.4)
Q12	I feel embarrassed showing my teeth when I smile	Strongly disagree	10 (4.8)
		Disagree	32 (15.3)
		Neutral	54 (25.8)
		Agree	75 (35.9)
		Strongly agree	38 (18.2)

Section C — Visual Analogue Scale (VAS)			
Q13	Concern about smile appearance (0–10)	Low (0–3)	28 (13.4)
		Moderate (4–7)	121 (57.9)
		High (8–10)	60 (28.7)
Q14	Importance of improving smile (0–10)	Low (0–3)	20 (9.6)
		Moderate (4–7)	110 (52.6)
		High (8–10)	79 (37.8)
Q15	Confidence while smiling (0–10)	Low (0–3)	26 (12.4)
		Moderate (4–7)	118 (56.5)
		High (8–10)	65 (31.1)
Section D — Knowledge, Awareness & Motivation			
Q16	Have you heard about orthodontic options	Metal braces	150 (71.8)
		Ceramic braces	112 (53.6)
		Clear aligners	135 (64.6)
		Lingual braces	68 (32.5)
		None	22 (10.5)
Q17	Main reason for orthodontic treatment	Aesthetic improvement	92 (44.0)
		Functional correction	28 (13.4)
		Both	75 (35.9)
		Other	14 (6.7)
Q18	Orthodontic treatment improves facial appearance	Yes	158 (75.6)
		No	18 (8.6)
		Not sure	33 (15.8)
Section E — Perception of Smile Features (05-point Likert Scale)			
Q19	Tooth alignment	1	8 (3.8)
		2	22 (10.5)
		3	60 (28.7)
		4	72 (34.4)
		5	47 (22.5)
Q20	Tooth color	1	10 (4.8)
		2	25 (12.0)
		3	68 (32.5)

		4	65 (31.1)
		5	41 (19.6)
Q21	Gum visibility when smiling	1	12 (5.7)
		2	30 (14.4)
		3	70 (33.5)
		4	60 (28.7)
		5	37 (17.7)
Q22	Symmetry of smile	1	9 (4.3)
		2	24 (11.5)
		3	66 (31.6)
		4	70 (33.5)
		5	40 (19.1)
Q23	Shape of lips during smile	1	7 (3.3)
		2	20 (9.6)
		3	62 (29.7)
		4	75 (35.9)
		5	45 (21.5)
Note: Values are presented as frequency (n) and percentage (%).			

Table 2: Association Between Selected Variables Using Chi-square Test

Variables Compared	χ^2 value	p-value
Gender vs Dental concern (Q5)	6.12	0.013*
Gender vs Wish to improve smile (Q10)	4.85	0.028*
Treatment vs Awareness (Q16)	5.74	0.017*
Dental concern vs Embarrassment (Q12)	18.36	<0.001*
Chi-square test applied. $p < 0.05$ considered statistically significant.		

Table 3: Comparison of Smile Perception Scores Using Independent Samples t-test

Q.No	Question	Category	Group	N	Mean ± SD	t-value	p-value
Q13	Concern about smile	Gender	Male	86	7.70 ± 1.85	1.85	0.066
			Female	123	7.07 ± 1.92		
		Treatment	Yes	82	7.31 ± 1.88	-0.06	0.954
			No	127	7.33 ± 1.91		
		Dental Concern	Yes	149	7.85 ± 1.74	3.92	<0.001*
			No	60	6.12 ± 1.95		
Q14	Importance of improving smile	Gender	Male	86	4.92 ± 2.14	-3.36	0.001*
			Female	123	6.27 ± 2.08		
		Treatment	Yes	82	7.17 ± 1.95	4.06	<0.001*
			No	127	5.28 ± 2.12		
		Dental Concern	Yes	149	6.88 ± 2.01	4.48	<0.001*
			No	60	4.72 ± 2.15		
Q15	Confidence while smiling	Gender	Male	86	7.63 ± 1.76	-1.39	0.164
			Female	123	7.99 ± 1.69		
		Treatment	Yes	82	7.65 ± 1.80	-0.83	0.406
			No	127	7.90 ± 1.72		
		Dental Concern	Yes	149	7.12 ± 1.83	-3.65	<0.001*
			No	60	8.54 ± 1.52		

Q13—Concern about smile; Q14—Importance of improving smile; Q15—Confidence while smiling. Values are expressed as mean \pm standard deviation. Independent samples t-test was applied; $p < 0.05$ was considered statistically significant.