

Cross-Cultural Analysis of Smile Characteristics, Perception, and Satisfaction Among Latvian and Uzbek Young Adults: A Comparative Study

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Introduction: Dental esthetics play a significant role in perceived facial attractiveness. This study aimed to assess and compare smile characteristics, smile perception and satisfaction with smile appearance among young adult populations in Latvia (Northern Europe) and Uzbekistan (Central Asia).

Methods: A total of 200 participants (100 Latvian and 100 Uzbek), aged 20–35 years, were divided into two groups. In the first group, photographs of the smiles of 50 Latvian and 50 Uzbek participants were analyzed for smile characteristics (smile type, smile symmetry, number of teeth displayed in a smile, position of maxillary incisor edge relative to the lower lip, smile arc, dental midline). In the second group, a self-administered questionnaire was distributed electronically to 50 respondents from each country to evaluate smile perception and satisfaction with smile appearance. The Wilcoxon–Mann–Whitney test, Spearman test, and Pearson Chi-Square test were used for statistical analyses.

Results: Statistically significant differences were found between Latvian and Uzbek participants in smile type ($p = 0.009$) and the number of teeth displayed in a smile ($p = 0.05$). Satisfaction with smile appearance was significantly higher among Uzbek participants compared to Latvians ($p = 0.004$). The average smile line and parallel smile arc were the most preferred designs in both countries.

Conclusion: Differences in smile characteristics and satisfaction with smile appearance exist between Latvian and Uzbek populations, while smile perception is largely similar. These findings highlight the influence of cultural backgrounds on self-perception of the smile and emphasize the importance of culturally informed dental treatment planning.

Keywords: dental esthetics, esthetic dentistry, self-perception of the smile, smile esthetics, Latvia, Uzbekistan

Introduction

The smile is essential for socialization and communication, shaping first impression of a person and enhancing attractiveness. It demonstrates self-confidence and expresses feelings of happiness, pleasure, success, and affection. One of the most distinguishing features of a smile is its dental appearance, which is considered a key factor in determining person's attractiveness.¹ However, esthetic preferences are highly subjective and result from factors such as gender, education, personal experiences, and cultural and social influences. Smile esthetics is gaining increasing importance and has become the primary motivation for patients to pursue dental treatment.² As these preferences are deeply rooted in cultural values, understanding population-specific perceptions of smile attractiveness is essential for delivering culturally competent and patient-centered dental care.

Several factors influence appearance of the smile. These include form, color, and position of the teeth, gingival display, smile line and smile symmetry. Specifically, the maxillary incisor and gingival display, transverse dimension, and width of the smile are important characteristics to be considered during dental treatment planning.^{3,4} Philtrum height, vertical maxillary dimension, maxillary incisor angulation and muscle recruitment affect the gingival display in a smile.^{5,6} Sarver³ suggested that displaying maxillary incisor crowns with 1–2 mm of gingival margin is more attractive than covering the teeth with the upper



lip. Partial coverage of maxillary incisors, on the other hand, was found to be more attractive by laypersons.^{7,8} When the gingival display is compared between two genders, females show more gingival tissue than males.⁹ In this study, esthetic preferences refer to perceptual evaluation of specific smile parameters, such as smile type, smile arc, and tooth and gingival display, which represent measurable parameters of smile esthetics described in previous literature.^{3,10}

Tjan et al¹⁰ proposed a standard for an esthetically pleasing smile based on four elements: smile type, parallelism of maxillary incisal curve with the lower lip, position of incisal curve relative to its contact with the lower lip, and the number of teeth displayed during a smile. This standard can be used as a reference for restoring dental esthetics. Studies found that position and curvature of upper lip, parallelism of anterior incisal curve with the lower lip, and number of teeth displayed in the smile affect smile attractiveness.¹¹

As a result of technological progress, the dental field has adopted tools such as digital smile design (DSD). DSD facilitates the prediction and representation of treatment outcomes, enhancing patient understanding and acceptance of proposed procedures.¹² Furthermore, artificial intelligence (AI) has emerged as a transformative technology across numerous fields of medicine and is gradually being integrated into dentistry.^{13,14} AI can perform image segmentation tasks such as tooth numbering, identification of tooth shapes, detection of destruction sites and apical lesions.^{15–17} Within esthetic dentistry, AI has potential for automating esthetic processes and identifying smile characteristics, reducing human error and subjectivity that is seen in DSD.¹⁸

Despite these technological advancements, our behavior and perception of surrounding situations, including perception of facial esthetics, are still being influenced by cultural backgrounds. Cultural norms influence ideas of an attractive smile. For example, Chapell¹⁹ found that individuals of European origin smile more frequently than Asians, and women tend to smile more than men. In order to achieve clinically satisfactory results, the clinician should understand that disagreement between patient's and dentist's perspectives on esthetics may lead to an esthetic appearance that falls short of the patient's expectations. Thus, it is important to investigate population's esthetic preferences in the ideal smile. This has an impact on patient's satisfaction with the treatment outcome.^{20–22} Dissatisfaction with one's dental appearance has an effect on self-esteem and psychosocial well-being.²³

Studies have demonstrated that upper central incisor exposure typically decreases with age, while lower tooth visibility increases due to a decline in dynamic smile movements.^{24,25} Because young adults are more sensitive and critical toward variations in smile features, such as the smile index and incisal smile position,²⁶ the 20–35-year age range was selected for this study to capture perceptions during period of highest esthetic awareness and dynamic smile activity.

Several studies have examined esthetic preferences and prevalent smile features across various cultural and national groups.^{27–30} However, no studies have investigated smile characteristics or smile perception among the Latvian (Northern European) and Uzbek (Central Asian) populations. Therefore, the aim of the present study was to evaluate and compare smile characteristics, smile perception, and satisfaction with smile appearance among 20–35-year-old individuals from Latvia and Uzbekistan. By addressing this gap, the study intends to contribute to culturally competent esthetic dentistry and support future digital tools in personalized treatment planning.

Materials and Methods

This cross-sectional study was conducted to compare smile characteristics, perception of smile attractiveness, and satisfaction with smile appearance between Latvian and Uzbek populations. A total of 200 participants (100 Latvian and 100 Uzbek), aged between 20 and 35 years, were included in the study. Participants were randomly divided into two subgroups for two assessments: smile characteristics, and smile perception and satisfaction. Randomization was performed using a simple random sampling method to minimize selection bias. With 50 participants per group (Latvian and Uzbek) in each assessment, the study had adequate statistical power (approximately 70% for medium and >95% for large effect sizes at $\alpha = 0.05$) to detect meaningful differences in smile perception and characteristics.

The study protocol was approved by the Ethics Committee of the University of Latvia, and all procedures were conducted in accordance with the principles of the Declaration of Helsinki. All participants provided informed consent. In the photographic subgroup, written consent was obtained. In the questionnaire subgroup, consent was implied through voluntary completion of the form after reading the study overview. All collected data were stored securely in a password-protected folder on the author's

computer. The anonymized dataset on smile characteristics is available at <https://doi.org/10.5281/zenodo.15882121>, and the anonymized dataset on smile perception and satisfaction is available at <https://doi.org/10.5281/zenodo.15880591>.

Assessment of Smile Characteristics

Smile characteristics were evaluated in the first subgroup, consisting of 50 Latvian participants (13 males, 37 females) and 50 Uzbek participants (14 males, 36 females). Standardized photographs of participants' smiles in the frontal view were collected for analysis. The inclusion criterion was a frontal-view photograph of the smile. Exclusion criteria included photographs lacking a clear frontal view, head rotation exceeding 10 degrees, blurred or of low quality photos. The following smile characteristics were analyzed:

- Smile type (high, average, low),
- Smile symmetry (symmetrical or asymmetrical),
- Number of teeth displayed in a smile (only fully visible teeth counted),
- Position of the maxillary incisor edge relative to the lower lip (touching, not touching, slightly covered, fully covered),
- Smile arc (parallel, straight, reverse, not visible),
- Dental midline (coincident or non-coincident with facial midline).

Assessment of Smile Perception and Satisfaction

The second subgroup consisted of 50 participants from each country who completed a self-administered questionnaire developed by the study authors. The target audience for this survey was general adult population aged 20–35 years. The survey was distributed electronically via Google Forms by sending it through social media and was available in Latvian, Uzbek, Russian, and English. It included questions assessing:

- Orthodontic treatment history,
- Satisfaction with smile appearance (rated on a 5 point Likert scale),
- Willingness to change any aspects of their smile,
- Preferences for different smile types and smile arcs.

To assess esthetic preferences objectively, participants were shown six black-and-white illustrations representing:

- Three smile line types: high, average, and low,
- Three smile arcs: parallel, straight, and reverse.

These simplified images were used to minimize bias from unrelated visual features such as tooth shape, color, or skin tone. The questionnaire used in this study is available in the Zenodo repository at <https://doi.org/10.5281/zenodo.15880591>.

Statistical Analysis

The data were analyzed using SPSS software version 27.0 (IBM Corp). Participants were categorized by country of origin: Latvian and Uzbek. Descriptive statistics (mean, standard deviation, percentage) were calculated for participant demographics and study variables. The Wilcoxon–Mann–Whitney test, Spearman test, and Pearson Chi-Square test were used for comparative analyses between Latvian and Uzbek participants. Statistical significance was set at $\alpha = 0.05$ for all tests.

Results

Assessment of Smile Characteristics

The average age of participants in the photographic subgroup was 24.88 years for Latvians and 25.06 years for Uzbeks (Table 1). Among smile types, the average smile line was most commonly observed in both groups, 78% of Latvian and

Table 1 Comparison of Smile Characteristics Between Latvian and Uzbek Participants

| Variable | Latvian Participants - N = 50 | Uzbek Participants - N = 50 | p-value |
|--|----------------------------------|--------------------------------|--------------|
| Gender | | | |
| - Male | 13 (26%) | 14 (28%) | |
| - Female | 37 (74%) | 36 (72%) | |
| Age: mean (SD) | 24.88 (4.34) | 25.06 (3.92) | |
| Smile type | | | 0.009 |
| - High | 6 (12%) | 4 (8%) | |
| - Average | 39 (78%) | 29 (58%) | |
| - Low | 5 (10%) | 17 (34%) | |
| Smile symmetry | | | 0.12 |
| - Symmetrical | 44 (88%) | 38 (76%) | |
| - Asymmetrical | 6 (12%) | 12 (24%) | |
| Number of teeth displayed in a smile | | | 0.05 |
| - Six anterior teeth | 4 (8%) | 7 (14%) | |
| - Six anterior teeth and first premolars | 27 (54%) | 18 (36%) | |
| - Six anterior teeth and first and second premolars | 18 (36%) | 16 (32%) | |
| - Six anterior teeth and mandibular teeth | 0 | 2 (4%) | |
| - Six anterior teeth, first premolars and mandibular teeth | 0 | 3 (6%) | |
| - Six anterior teeth, first and second premolars, and mandibular teeth | 1 (2%) | 3 (6%) | |
| - Mandibular teeth only | 0 | 1 (2%) | |
| Position of maxillary incisor edge relative to the lower lip | | | 0.2 |
| - Touching the lower lip | 12 (24%) | 6 (12%) | |
| - Not touching the lower lip | 29 (58%) | 34 (68%) | |
| - Slightly covered by lower lip | 6 (12%) | 7 (14%) | |
| - Covered by lower lip | 3 (6%) | 3 (6%) | |
| Smile arc | | | 0.6 |
| - Parallel | 21 (42%) | 22 (44%) | |
| - Straight | 20 (40%) | 20 (40%) | |
| - Reverse | 3 (6%) | 2 (4%) | |
| - Not visible | 6 (12%) | 6 (12%) | |
| Dental Midline | | | 0.115 |
| - Coincident with the facial midline | 40 (80%) | 33 (66%) | |
| - Not coincident with the facial midline | 10 (20%) | 17 (34%) | |

Note: Bold values indicate statistically significant difference ($p \leq 0.05$).

58% of Uzbek participants. However, low smile line was more prevalent among Uzbeks (34%) compared to Latvians (10%). This difference was statistically significant ($p = 0.009$) (Table 1). Smile symmetry was predominantly symmetrical in both groups, with no statistically significant difference between them ($p > 0.05$) (Table 1).

Regarding the number of teeth displayed, the most common pattern included anterior teeth and first premolars. About 54% of Latvians and 36% of Uzbeks showed teeth up to the first premolars, and 36% of Latvians and 32% of Uzbeks displayed teeth up to the second premolars (Table 1). Six anterior teeth were displayed in the smiles of 8% Latvian and 14% Uzbek subjects. Additional findings among Uzbek participants included 6% displayed both maxillary and mandibular teeth, 4% showed anterior teeth with visible mandibular teeth, and 6% displayed first premolars. Only 2% of Uzbek participants exhibited mandibular-only smile display. A statistically significant difference was found in the number of visible teeth between the two populations ($p = 0.05$).

In terms of the position of the maxillary incisor edge relative to the lower lip, not touching the lower lip was the most common finding, 58% of Latvians and 68% of Uzbeks. Touching the lower lip was observed in 24% of Latvians and 12% of Uzbeks. Slightly covered by the lower lip occurred in 12% of Latvians and 14% of Uzbeks. Maxillary incisor edge fully covered by the lower lip was reported in 6% of both groups. No significant difference was observed between the groups in this parameter ($p > 0.05$) (Table 1).

The smile arc was most often either parallel or straight in both groups, and no significant difference was noted ($p > 0.05$) (Table 1). Regarding the dental midline, coincidence with the facial midline was found in 80% of Latvian participants and 66% of Uzbek participants. Non-coincidence was observed in 20% of Latvians and 34% of Uzbeks (Table 1). However, this difference was not statistically significant ($p > 0.05$).

Assessment of Smile Perception and Satisfaction

A total of 50 Latvian (40 females, 10 males; mean age 24.52) and 50 Uzbek participants (33 females, 17 males; mean age 25.72) completed the questionnaire (Table 2). Regarding orthodontic treatment history, 42% of Latvian and 32% of Uzbek participants reported having undergone orthodontic treatment in the past. However, no statistically significant differences were found between the two groups in terms of orthodontic treatment history ($p = 0.3$), duration of treatment ($p = 0.4$), or satisfaction with treatment outcomes ($p = 0.5$) (Table 2).

Table 2 Comparison of Smile Perception and Self-Contentment with the Appearance of a Smile Between Latvian and Uzbek Participants

| Variable | Latvian Participants – N = 50 | Uzbek Participants – N = 50 | p-value |
|--|----------------------------------|--------------------------------|---------|
| Gender | | | |
| - Male | 10 (20%) | 17 (34%) | |
| - Female | 40 (80%) | 33 (66%) | |
| Age: mean (SD) | 24.52 (3.84) | 25.72 (4.5) | |
| Underwent orthodontic treatment | | | |
| - Yes | 21 (42%) | 16 (32%) | 0.3 |
| - No | 29 (58%) | 34 (68%) | |
| The duration of orthodontic treatment | N = 21 | N = 16 | |
| - 6 months | 2 (9.5%) | 4 (25%) | 0.4 |
| - 8 months | 2 (9.5%) | 0 | |
| - 9 months | 1 (4.8%) | 0 | |
| - 1 year | 5 (23.8%) | 3 (18.75%) | |
| - 1.5 years | 3 (14.2%) | 0 | |
| - 2 years | 6 (28.6%) | 3 (18.75%) | |
| - 2.5 years | 0 | 1 (6.25%) | |
| - 1 year removable appliance and 1.5 years braces | 1 (4.8%) | 0 | |
| - 3 years | 0 | 4 (25%) | |
| - 3.5 years | 1 (4.8%) | 0 | |
| - More than 4 years | 0 | 1 | |
| Satisfaction with orthodontic treatment outcome | N = 21 | N = 16 | |
| - Very dissatisfied | 0 | 2 (12.5%) | 0.5 |
| - Dissatisfied | 0 | 1 (6.25%) | |
| - Slightly satisfied | 3 (14.2%) | 0 | |
| - Satisfied | 9 (42.9%) | 4 (25%) | |
| - Very satisfied | 9 (42.9%) | 9 (56.25%) | |

(Continued)

Table 2 (Continued).

| Variable | Latvian Participants – N = 50 | Uzbek Participants – N = 50 | p-value |
|---|-------------------------------------|-----------------------------------|--------------|
| Satisfaction with the appearance of a smile | | | |
| - Very dissatisfied | 0 | 1 (2%) | 0.004 |
| - Dissatisfied | 4 (8%) | 1 (2%) | |
| - Slightly satisfied | 11 (22%) | 8 (16%) | |
| - Satisfied | 24 (48%) | 12 (24%) | |
| - Very satisfied | 11 (22%) | 28 (56%) | |
| Features of the smile that participants would like to change | | | |
| - Nothing | 8 (16%) | 22 (44%) | 0.09 |
| - Color of the teeth | 25 (50%) | 13 (26%) | |
| - Shape of the teeth | 10 (20%) | 5 (10%) | |
| - Color and shape of the teeth | 1 (2%) | 0 | |
| - Crooked teeth | 1 (2%) | 2 (4%) | |
| - Crooked teeth and color of the teeth | 0 | 1 (2%) | |
| - Fillings | 1 (2%) | 0 | |
| - Bite | 1 (2%) | 2 (4%) | |
| - Bite and gaps between the teeth | 0 | 1 (2%) | |
| - Protruded teeth | 1 (2%) | 0 | |
| - Visible gums | 1 (2%) | 0 | |
| - Shape of the dental arch | 0 | 2 (4%) | |
| - Thickness of the lips | 0 | 1 (2%) | |
| - Shape of the cheeks | 1 (2%) | 0 | |
| - Insert teeth | 0 | 1 (2%) | |
| Perception of the smile type | | | |
| - High smile line | 14 (28%) | 11 (22%) | 0.4 |
| - Average smile line | 33 (66%) | 35 (70%) | |
| - Low smile line | 3 (6%) | 4 (8%) | |
| Perception of the smile arc | | | |
| - Parallel smile arc | 34 (68%) | 40 (80%) | 0.12 |
| - Straight smile arc | 9 (18%) | 8 (16%) | |
| - Reverse smile arc | 7 (14%) | 2 (4%) | |

Note: Bold values indicate statistically significant difference ($p \leq 0.05$).

Smile satisfaction was assessed using a 5-point Likert scale. Among Latvian participants, 22% rated their satisfaction as 5 (very satisfied), while 48% gave a rating of 4. Another 22% selected a rating of 3, and 8% rated their satisfaction as 2. None of the Latvian participants rated their smile satisfaction as 1. In comparison, 56% of Uzbek participants rated their smile satisfaction as 5, 24% as 4, 16% as 3, 2% as 2, and another 2% as 1. These results revealed a statistically significant difference in self-perceived smile satisfaction between the two populations ($p = 0.004$), with Uzbek participants generally reporting higher satisfaction (Table 2).

When participants were asked whether they would like to change anything about their smile, 44% of Uzbek and 16% of Latvian respondents stated that they would not change anything. Among those who expressed a desire to improve their smile, tooth color was the most frequently mentioned concern, cited by 50% of Latvians and 26% of Uzbeks. Tooth shape was also a common concern, noted by 20% of Latvians and 10% of Uzbeks. Other reported aspects participants wished to change included tooth alignment, bite, visibility of the gums, dental fillings, form of the dental arch, missing teeth, and lip thickness. Although differences in desired changes were found, they did not reach statistical significance ($p = 0.09$) (Table 2).

In terms of smile type preferences, the average smile line was the most preferred option among participants from both countries, while the low smile line was the least preferred. No statistically significant difference was found between Latvian and Uzbek participants in smile type preference ($p > 0.05$) (Table 2). Regarding smile arc preferences, 68% of Latvian and 80% of Uzbek participants favored the parallel smile arc. The straight arc was chosen by 18% of Latvians and 16% of Uzbeks, while the reverse arc was least preferred, selected by 14% of Latvians and only 4% of Uzbeks. These differences were not statistically significant ($p = 0.6$) (Table 2).

Discussion

One of the most important parts of treatment planning in restorative and orthodontic dentistry is thorough assessment of the smile characteristics and an understanding of the patient's preferences and expectations. Considering patient expectations enhances treatment satisfaction and improves the value of the treatment.

This study investigated and compared smile characteristics, perception, and satisfaction among young adults aged 20–35 from Latvia and Uzbekistan. This age group was selected because previous studies have shown that upper central incisor exposure typically decreases with age, while lower tooth visibility increases,^{24,25} and individuals within this range exhibit greater esthetic awareness and sensitivity to smile variations.²⁶ Although the sample size was moderate, it allowed for meaningful cross-cultural comparisons and was consistent with similar research in this field. Our findings reveal several notable distinctions, especially in smile type and satisfaction levels, which may reflect underlying cultural influences.

We analyzed smile type as the relationship between the upper lip and the gingival line of maxillary incisors. When smile type was assessed between Latvian and Uzbek participants, the largest difference was observed in the prevalence of low smile line. Low smile line was significantly more prevalent among Uzbek participants (34%) than among Latvians (10%). However, the average smile line was the most prevalent in both groups. Similar results have been published by Tjan et al.¹⁰ Choi et al.²⁴ and Nold et al.²⁷ Previous research has shown that average smile lines, with minimal maxillary incisor coverage (0–2 mm), are perceived as the most attractive,^{31,32} while excessive gingival display is often viewed as less desirable.³¹ Participants from both countries preferred average smile lines and rated low smile lines as least attractive. Interestingly, low smile lines may benefit restorative treatment, as imperfections are less visible and more acceptable to patients.³³ The higher prevalence of low smile lines among Uzbek participants may be related to underlying anatomical characteristics, such as thicker or longer upper lips, reduced vertical maxillary height, or variations in craniofacial morphology that limit incisor display. These variations may be influenced by genetic and ethnic factors, as craniofacial proportions and soft-tissue profiles often differ among populations.³⁴ Clinically, this information can guide individualized esthetic planning, such as determining the optimal incisal edge position and gingival display during restorative and orthodontic procedures. Understanding such ethnic variations allows clinicians to tailor treatment to patient's facial morphology and cultural expectations, ultimately improving satisfaction and esthetic harmony.

Moreover, these cross-cultural findings have practical implication for digital smile design (DSD) and AI-based esthetic analysis. Integrating population-specific data on smile line, lip curvature, arc type, and esthetic preferences can help refine digital simulation tools and improve their predictive accuracy. Algorithms trained on diverse morphologic profiles can generate more realistic and culturally appropriate digital outcomes, enhancing communication between clinician and patient. Clinically, incorporating both objective smile characteristics and esthetic preferences into digital workflows can enhance diagnostic precision, support individualized esthetic planning, and improve patient satisfaction with treatment outcomes. Future studies could focus on building broader, cross-ethnic datasets to support this development.

In terms of visible teeth, most participants displayed six anterior teeth and first premolars. However, some prior studies reported a higher prevalence of smiles extending to the second premolars or first molars.^{10,11,35} Esthetically, broader smiles that reveal teeth to the first molar are generally considered more attractive.¹¹

Regarding the relationship between the maxillary incisal edge and the lower lip, the most common finding in both populations was the position of the anterior teeth edge not touching the lower lip, consistent with earlier studies.^{10,11,24,27} Depending on the opening of the mouth, mobility of the lips, and contraction of the muscles of the lower lip (m.

risorius, m. mentalis, m. depressor anguli oris, m. depressor labii inferioris), the relationship between the incisal edge and lower lip can differ even in the same individual.⁵

Several studies^{10,24,27} reported higher prevalence of the parallel smile arc. In contrast, Maulik et al³⁶ reported higher observation of straight smile arc. In our study, parallel and straight arcs were most common, whereas reverse smile arc was observed less. The parallel arc is generally perceived as the most esthetically appealing,^{4,37,38} and was similarly preferred by both Latvian and Uzbek participants.

Coincidence between the dental and facial midlines was more common among Latvians (80%) than Uzbeks (66%), although the difference was not statistically significant. The most prevalent natural alignment is a coincident midline, which is generally regarded as esthetically ideal,²⁴ with deviations of more than 2 mm being noticeable.³⁹ Nold et al²⁷ and Melo et al³⁵ reported highest prevalence of a match between facial and dental midline in Caucasian patients. However, studies performed to assess coincidence of dental midline in Peruvian and Brazilian populations found high prevalence of non-coincident dental midline.^{40,41} In our study, dental midline did not coincide with the facial midline in 20% of Latvian and 34% of Uzbek participants.

Patients seeking orthodontic treatment place significant importance on esthetics.⁴² Therefore, participants of this study were asked to rate satisfaction with orthodontic treatment outcome. An equal number of respondents from both countries who underwent orthodontic treatment were satisfied with the treatment outcome (Table 2). None of the Latvian participants were disappointed with orthodontic treatment outcome, while two Uzbek participants expressed dissatisfaction. Satisfaction with the outcome of orthodontic treatment is greatly influenced by the doctor-patient relationship.⁴³ Patients who had painful experiences during orthodontic treatment had lower satisfaction rates and patients who were motivated to undergo orthodontic treatment before treatment initiation were more satisfied with the result.⁴⁴

The perception of smile attractiveness differs among individuals and is influenced by various factors. As a consequence, assessment of population esthetic self-perception and analysis of the results is difficult.⁴⁵ According to our findings, more Uzbek participants rated their smile highly (rating 5) compared to Latvians. This contrast may reflect cultural or psychological factors influencing self-image and esthetic expectations. A study carried out to compare self-perceptions of dental esthetics among Brazilian dental students reported that 92% of participants were positive about their smiles.²⁸ According to Alkhatib et al,²⁹ 76% of adult participants from the United Kingdom were satisfied with their dental appearance.

When we asked our participants about smile characteristics that they would like to change, most of them stated that they would like to change the color of their teeth. Many aspects influence the overall perception of tooth color, including lighting pattern, translucency, opacity, light scattering, and polish.⁴⁶ According to a study conducted in Malaysia, 56.2% of participants were dissatisfied with the color of their teeth.³⁰ It was revealed that 33.4% of respondents from the United Kingdom would like to improve the color of their teeth.²⁹ Da Silva et al²⁸ reported that 60% of participants wanted to whiten their teeth.

The shape of the teeth was the second most common concern, particularly among Latvian participants. The shape and proportion of anterior teeth play a critical role in smile esthetics, with concepts like golden proportions contributing to perceived harmony.⁴⁷ These findings provide extensive information for specialists on the specific criteria of the smile that a population aged 20–35 years would desire to change the most, which facilitates the process of recognizing esthetic preferences in the treatment of patients in this age group.

This study has several limitations. Although the sample size provided meaningful cross-cultural findings, it was relatively small, which limits generalizability. Another limitation is that different participant groups were used for the photographic assessment of smile characteristics and for self-perception survey, preventing direct correlation between objective smile features and subjective satisfaction. Therefore, future research should analyze objective variables influencing smile attractiveness in conjunction with participants' self-perception, taking into account the geographical, cultural, and socioeconomic factors involved. Larger and more diverse cohort studies would provide more comprehensive understanding of how cultural, anatomical, and psychological variables interact in determining smile esthetics.

Despite these limitations, present findings emphasize clinical importance of considering both anatomical and cultural factors in smile analysis. Incorporating such knowledge into restorative and orthodontic treatment planning can enhance treatment precision, ensure cultural adaptability, and ultimately improve patient-centered esthetic outcomes.

Conclusion

This study is the first to compare smile characteristics, perception, and satisfaction between Latvian and Uzbek populations. Based on the findings, the following conclusions can be drawn:

1. Slight deviations in smile characteristics exist between Latvian and Uzbek populations.
2. Smile perception, including esthetic preferences for smile line and arc, was largely similar across both groups.
3. Smile satisfaction differed significantly, with Uzbek participants reporting higher overall satisfaction with their smile appearance.

Therefore, we can state that cultural background may influence self-perception of smile esthetics. Understanding such cultural and regional variations is essential for delivering personalized, esthetically driven, and culturally competent dental care, particularly in guiding digital smile design, AI-based esthetic analysis, and individualized treatment planning.

Disclosure

All authors declare that they have no conflicts of interest.

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