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RESEARCH ARTICLE

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Development and psychometric properties of the Turkish version of the Orofacial Esthetic Scale

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Abstract

Objective: This study aimed to develop the Turkish version of the Orofacial Esthetic Scale (OES-Tr) and to evaluate its psychometric properties.

Materials and Methods: The OES-Tr questionnaire was obtained from the English version of OES by translation and back-translation. The current version's psychometric properties were evaluated in a cohort of 221 participants (81 dental students, 70 dentists with 1–10 years of clinical experience, and 70 dentists with 11–20 years of clinical experience). To assess the test–retest reliability, the OES was administered twice to all participants, with a time interval of 2–4 weeks. The reliability and validity of the questionnaire were assessed. Also, in validity studies, OES total scores were correlated with Oral Health Impact Profile-Turkish Version (OHIP-Tr) total scores.

Results: The Cronbach's alpha value obtained from seven items was 0.866 in the examination performed on all individuals. Reliability results show that all questionnaire items are consistent within the test. Bartlett's test of sphericity was statistically significant ($p < 0.05$) and Kaiser–Meyer–Olkin test was 0.794. The results of the exploratory factor analysis indicated the creation of a single-factor structure. The examinations conducted on all participants revealed a statistically significant weak negative correlation between OES and OHIP scores ($r = -0.144$).

Conclusions: OES-Tr can be utilized as a reliable tool to evaluate an individual's perception of their orofacial appearance. With its excellent psychometric properties, it serves as a valuable instrument for assessing self-perceived orofacial esthetics.

Clinical Significance: OES-Tr is a valuable instrument for assessing the appearance of the orofacial region, with good psychometric properties.

KEYWORDS

oral health, orofacial esthetic, psychometrics, quality of life, self-assessment, validation studies

This study was presented at the 26th International Turkish Prosthodontics and Implantology Association Congress.

1 | INTRODUCTION

A pleasant facial appearance plays an important role in social interactions and has been reported to increase an individual's self-confidence.[1] However, esthetic perception may vary across cultures, and it does not have definitive rules and is extremely subjective.[2,3] Improving dental esthetics is one of the main reasons for seeking dental treatment.[3] Studies show that patients satisfied with dental treatment have higher self-confidence and quality of life.[4] Orofacial appearance's impact on self-confidence is equal for both genders.[3] However, older individuals express lower satisfaction levels with orofacial appearance.[5] Personal satisfaction with dentofacial esthetics has also been associated with general well-being.[6,7] Dental professionals possess the expertise to analyze the size, shape, position, and color of teeth, the line and position of the gums and lips, and the shape of the chin and face. Their skillset enables them to evaluate overall facial harmony and pay attention to detail, which makes them more adept at assessing teeth than patients.[8,9] Although dentists adhere to guidelines providing objective criteria, patients typically assess their orofacial esthetics based on standards different from clinicians'.[10,11] The discrepancy in viewpoints between clinicians and patients has resulted in the need for a more objective and impartial assessment tool.

The Oral Health Impact Profile (OHIP) is widely recognized as one of the most effective instruments for evaluating Oral Health-Related Quality of Life (OHRQoL).[12–14] The OHIP questionnaire is a dependable and valid instrument for evaluating people's thoughts about oral health. It has excellent cross-cultural psychometric properties. However, the original version with 49 items can be challenging to implement. Therefore, a shorter version with only 14 items has been developed and shown to be reliable.[15,16] Only 1 item in OHIP-14 evaluates orofacial esthetics. It has been suggested that the OHIP-esthetic questionnaire can be used as a concise version of the OHIP tool to evaluate esthetic alterations after whitening.[17] However, it has been reported to lack adequate psychometric properties for assessing esthetic dental impairment.[18] Consequently, it was recommended that a more specialized tool should be developed to address this issue.

The Orofacial Esthetic Scale (OES) is a self-assessment questionnaire that has been developed to evaluate the esthetics of the facial and dental features.[19] The OES comprises eight items that are used to assess the orofacial region and provide a comprehensive self-assessment tool for the estimation of esthetics.[19] The OES has been subjected to psychometric analysis, and its reliability and validity has been documented.[19,20] The questionnaire was developed in Sweden and translated into English (OES-E) by the same researchers.[19] Cross-cultural adaptation of the OES involves translating and adapting the instrument into languages other than the source language.[1] The original survey has been translated and adapted into many different languages and is consistently acceptable in all cultures.[1,20,21–26] The OES questionnaire has not been adapted to Turkish yet. However, introducing it alongside the OHIP scale can significantly improve patients' satisfaction with dental treatment and prosthetic or restorative treatment outcomes.

TABLE 1 Original Orofacial Esthetic Scale and Turkish version.

How do you feel about the appearance of your face, your mouth, your teeth and your teeth replacements (crowns, bridges and implants)? 0 = very dissatisfied 10 = very satisfied	Yüzünüzün, ağzınızın, dişlerinizin ve diş protezlerinizin (kronlar, köprüler ve implantlar) görünümüyle ilgili nasıl hissediyorsunuz? 0 = Hiç memnun değilim 10 = Çok memnunum
1. Your facial appearance	1. Yüzünüzün görünümü
2. Appearance of your facial profile	2. Yüz profilinizin görünümü
3. Your mouth's appearance (smile, lips, and visible of teeth)	3. Ağzınızın görünümü (gülümseme, dudaklar ve dişlerin gözükmesi)
4. Appearance of your rows of teeth	4. Dişlerinizin sıralanışının görünümü
5. Shape/form of your teeth	5. Dişlerinizin şekli/formu
6. Color of your teeth	6. Dişlerinizin rengi
7. Your gum's appearance	7. Diş etlerinizin görünümü
8. Overall, how do you feel about your face, your mouth, and your teeth	8. Genel olarak yüzünüz, ağzınız ve dişleriniz ile ilgili nasıl hissediyorsunuz

This study aimed to develop the Turkish version of the Orofacial Esthetic Scale questionnaire and examine the perception of orofacial esthetics in a population of dentists with different professional experiences and dental students. The null hypotheses were that (1) OES-Tr would show similar results to previous versions. (2) The OES-Tr scores would not be affected by the different professional experiences.

2 | MATERIALS AND METHODS

A detailed protocol of the study was evaluated and approved by the Pamukkale University Ethical Committee with code E-60116787-020-390717. As per the ethical guidelines mentioned in the Declaration of Helsinki and Good Clinical Practice, written consent after being duly informed was provided by all participants who took part in the study. In exploratory factor analysis, it is generally recommended to maintain a participant-to-item ratio of at least 5:1, whereas a more widely accepted ratio is 10:1.[27] It was also planned to compare groups with different experiences in our study. Assuming that the effect size of the difference to be obtained from this comparison would be moderate ($F = 0.6$), it was planned that the power to be obtained in the study would reach 90% at the 95% confidence level if at least 69 people (total 207) were included in each group.

The OES questionnaire consists of eight questions that focus on the appearance of the face, mouth, teeth, and any prosthetic replacements. In the first seven questions, participants are required to assign a grade from 0 to 10 for each question, where 0 represents extreme dissatisfaction, and 10 indicates complete satisfaction. Therefore, higher scores indicate that individuals are more satisfied with their appearance. The eighth item, which assesses individuals' overall

TABLE 2 Internal consistency of OES-Tr.

	Mean ± SD	Scale mean if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Item 1	7.52 ± 1.53	44.33	0.689	0.842
Item 2	7.35 ± 1.62	44.50	0.630	0.849
Item 3	7.16 ± 1.9	44.69	0.732	0.834
Item 4	7.4 ± 1.96	44.46	0.649	0.846
Item 5	7.61 ± 1.87	44.25	0.701	0.838
Item 6	6.97 ± 1.87	44.88	0.608	0.852
Item 7	7.84 ± 1.64	44.02	0.480	0.867
OES total score	51.86 ± 9.27			

Abbreviations: OES, Orofacial Esthetic Scale; OES-Tr, Turkish version of the Orofacial Esthetic Scale.

TABLE 3 Test–retest reliability of the items (intraclass correlations).

All participants ($n = 221$)			
	ICC	95% CI	Factor loadings for Factor 1
Item 1	0.870	0.830–0.900	0.798
Item 2	0.860	0.818–0.893	0.755
Item 3	0.895	0.863–0.919	0.822
Item 4	0.874	0.836–0.904	0.752
Item 5	0.856	0.812–0.889	0.785
Item 6	0.885	0.850–0.911	0.714
Item 7	0.854	0.809–0.888	0.592
OES total score	0.929	0.907–0.945	

Abbreviations: 95% CI, 95% confidence interval; Factor 1, construct validity and item loadings; ICC, intraclass correlation coefficient; OES, Orofacial Esthetic Scale.

TABLE 4 Inter item correlation coefficients matrix.

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7
Item 1	1.000	0.830	0.581	0.406	0.448	0.469	0.398
Item 2		1.000	0.538	0.387	0.388	0.395	0.379
Item 3			1.000	0.714	0.582	0.502	0.309
Item 4				1.000	0.685	0.405	0.284
Item 5					1.000	0.552	0.435
Item 6						1.000	0.445
Item 7							1.000

impression of their orofacial esthetics, was excluded from the OES total score.

During the translation and cultural adaptation process of OES into Turkish (OES-Tr), the guidelines of the previously published articles were followed.[14,23] The English version of the scale was translated into Turkish by two native English translators. Afterward, the Turkish version of OES was translated back into English by two different native English professional translators. There were no significant differences found between the original questionnaire and the translated version. The translated version was finally evaluated by three experienced dentists and approved as the final version. The approved Turkish version of the OES was pilot-tested in 20 individuals and asked whether they had problems understanding or answering the items. It was reported that there was no difficulty or incomprehensibility in understanding and answering any questionnaire items. These individuals were excluded from the main study.

Individuals who were undergoing treatment for head and neck cancer, or had orofacial anatomical defects or radiotherapy in the same area, were not included in the study. Additionally, individuals who could not be contacted for retesting after the initial test or who provided incomplete responses were also excluded from the study. After these exclusion procedures, 81 dentistry students who have not started clinical practice yet, 70 dentists with 1–10 years of clinical experience, and 70 dentists with 11–20 years of clinical experience

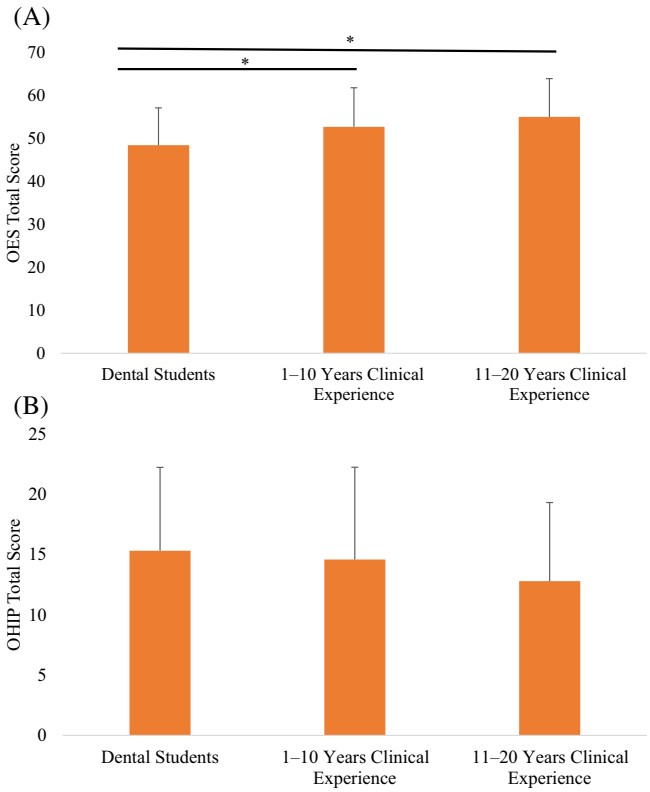

FIGURE 1 (A) Orofacial Esthetic Scale (OES) scores according to participants' experiences. (B) Oral Health Impact Profile (OHIP) scores according to participants' experiences.

were included in this study. These participants were asked to answer both the OES-Tr form (Table 1) and the OHIP-14 form previously translated into Turkish previously.[16] After the initial test, all the participants underwent a retest with the same procedure after a period of 2–3 weeks. This timeframe was selected to prevent patients from recalling previous answers but short enough to avoid changes in oral condition that could affect esthetics, similar to previous adaptation studies.[21,28]

2.1 | Statistical analysis

The statistical analyses were performed utilizing the IBM SPSS Statistics 25 software (Armonk, NY: IBM). Internal consistency was evaluated using Cronbach's alpha and inter-item correlation to determine the consistency and reliability of OES-Tr total scores. Calculations were made to evaluate the internal consistency of the questionnaire, considering that Cronbach's Alpha of at least 0.7 indicates high reliability.[29]

Test–retest reliability is a method of measuring the consistency of a questionnaire by administering it twice to the same group of people over a certain period. If the questionnaire accurately measures the orofacial esthetic construct, then the results should remain relatively consistent without significant intervention within an appropriate timeframe. The test–retest reliability is determined by using the intraclass correlation coefficient (ICC). The ICC values less than 0.40 indicate poor interclass correlation, those between 0.41 and 0.60 indicate moderate correlation, while those between 0.61 and 0.80 indicate good correlation. Values above 0.80 indicate excellent interclass correlation.[30]

As part of the validation process of the OES-Tr, construct, convergent, and discriminative validity were assessed. The construct validity of the study was evaluated using explanatory factor analysis, and the validity was confirmed by applying the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity. To establish the convergent validity of the study, we have computed Pearson's correlation coefficient between the OES-Tr and OHIP-Tr. Discriminative validity was established by comparing OES scores between students and dentists with 1–10 and 11–20 years of experience. One-way analysis of variance (ANOVA) with Tukey post hoc and Kruskal–Wallis with Mann–Whitney *U* post hoc (Bonferroni corrected) was used to compare scores between groups ($p < 0.05$).

3 | RESULTS

It was observed that the OES scores for both female and male participants exhibited no significant difference. Therefore, the data collected from both genders were merged to create a unified dataset.

Cronbach's alpha coefficient demonstrated high reliability, with a value of 0.866. When items were deleted one at a time, the coefficient ranged from 0.834 to 0.867, indicating sufficient stability (Table 2). Table 3 shows the test–retest reliability results as an average score of 0.929 for the total summary. Individual scores ranged from 0.854 for "Your gum's appearance" to 0.895 for "Your mouth's appearance," indicating excellent correlation.

The results were checked to make sure that there were no extreme scores, either too high (ceiling effects) or too low (floor effects). Table 4 exhibits the inter-item correlation matrix, which reveals that the items "Alignment" and "Gum" displayed the weakest correlation of 0.284, while the items "Face" and "Profile" demonstrated the strongest correlation of 0.83.

The factor loadings for each item fell within the range of 0.674 and 0.868, as seen in Table 3. Bartlett's test of sphericity produced a test statistic of 834.846 ($df = 21$, $p < 0.001$), indicating a good fit of the data to the factor model. Moreover, the KMO measure of sampling adequacy yielded a value of 0.794. The exploratory factor analysis demonstrated a one-factor structure based on the eigenvalue greater than 1. This model accounted for 56.1% of the variance, thereby confirming the one-dimensional nature of the OES-Tr. During the validity review, the total scores of the OHIP-Tr were examined for correlation with those of the OES. The examinations' outcomes on all individuals revealed a weak, statistically significant, and negative relationship between OHIP scores and OES scores ($r = -0.144$).

Items and total scores were compared between student and dentistry groups to assess discriminative validity. A significant difference was found between the three groups in all items and total scores

TABLE 5 Scale points comparisons according to groups (mean [±SD] and median [IQR]).

	Dental students	1–10 years clinical experience	11–20 years clinical experience	Inter group *p*
Item 1	7.2 ± 1.4	7.7 ± 1.7	7.8 ± 1.5	0.021* a
	7 (6.5–8)	8 (7–9)	8 (7–9)	
Item 2	7 ± 1.5	7.4 ± 1.7	7.7 ± 1.6	0.029* a
	7 (6–8)	7 (6–8)	8 (7–9)	
Item 3	6.7 ± 1.8	7.2 ± 1.9	7.6 ± 2	0.01* a
	7 (6–8)	7 (6–8.3)	8 (6.8–9)	
Item 4	7 ± 2	7.4 ± 1.9	7.8 ± 1.9	0.022* a
	7 (6–8)	7.5 (6–9)	8 (7–9)	
Item 5	7 ± 2.1	7.9 ± 1.6	8.1 ± 1.7	0.0001* ab
	7 (6–8)	8 (7–9)	8 (7–10)	
Item 6	6.3 ± 1.8	7.2 ± 1.6	7.5 ± 2	0.0001* ab
	6 (5–7.5)	7 (6–8)	8 (6–9)	
Item 7	7.3 ± 1.6	7.9 ± 1.6	8.4 ± 1.5	0.0001* ab
	7 (6–8)	8 (7–9)	8.5 (7–10)	

Abbreviations: IQR: Inter Quantile Range.
*$p < 0.05$ statistically significant; SD, standard deviation; med (IQR): median (25th–75th percentiles); a: significant difference between dental students and 11–20 years clinical experience; b: significant difference between dental students and 1–10 years clinical experience.

($p < 0.05$). During the first four items of the OES, it was observed that the students' values were significantly lower when compared when individuals with 11–20 years of clinical experience. Upon analysis of items 5–7 and total scores, a significant difference was observed between students and those with 1–10 or 11–20 years of clinical experience (Figure 1). Further details regarding the multiple comparisons are shown in Table 5.

4 | DISCUSSION

This study aimed to develop a Turkish version of the Orofacial Esthetic Scale (OES-Tr). The scale consists of eight items, seven of which address specific aspects of facial esthetics, and the remaining one relates to the general impression of orofacial esthetics. The translation process has been successfully concluded, with only minor adjustments required. Additionally, the OES-Tr uses an 11-point response scale, the same as the original version.

Ensuring that any observed changes in a subject-based outcome measure are due to the intervention rather than the outcome instrument is crucial. Reliability plays a key role, with test–retest reliability and internal consistency being two critical aspects. Item-total score correlations were employed in this study to measure the correlation between the total scores and each item. All correlations between items and corrected item-total correlations were positively correlated and significantly exceeded the recommended threshold of 0.2. These results indicate that the OES-Tr possesses good internal consistency reliability. To ensure test–retest reliability, it is recommended to maintain an appropriate interval between repeated tests to prevent recall bias, but not so long that clinical changes may occur. Although no specific time interval has been established, generally, a period of 1–2 weeks is deemed as an appropriate and reasonable duration.[31] The test–retest reliability results for the OES-Tr vary between 0.854 and 0.895, indicating that the instrument is reliable and stable. These findings are comparable to the Croatian[20] and Chinese[23] versions and higher than the original English version,[19] providing further support for the OES-Tr as a reliable assessment tool.

Validity is another crucial psychometric property that a questionnaire must possess. Construct validity represents the degree to which a given assessment instrument measures the concept it claims to measure. This measure is evaluated by comparing the scores obtained by the instrument with other measures consistent with the theoretically derived hypotheses on the concept being evaluated.[23] In the present study, the KMO measure of sampling adequacy exceeded the recommended threshold[32] and a one-factor structure was revealed by factor analysis, explaining 56.1% of the variance, consistent with the previous versions.[1,12,21,23,25] According to the analysis of factor loadings, all the items exhibited a coefficient surpassing the 0.50 threshold, indicating a robust association between each item and its respective factor.

Convergent validity was assessed by the correlation of OHIP-Tr and OES-Tr. Formulating an accurate definition of the esthetic appearance of the orofacial region is a multifaceted process that is influenced by various factors such as cultural background and individual perceptions.[21] However, studies have shown that patients dissatisfied with their appearance often experience a lower quality of life.[33] On the OHIP scale, higher values indicate patients with a lower quality of life, and lower values indicate healthy individuals.[34] Therefore, OHIP and OES scoring systems work in reverse[35] and individuals with lower OHIP values are expected to have higher OES values. Similarly, in the current study, a negative correlation was found between OHIP and OES values.

OES is designed to ensure accurate communication between patients and clinicians and evaluate the effectiveness of treatments. In previous versions, the evaluation of the necessity of treatment and the effectiveness of different treatment options was conducted.[21,23,34] However, dentists' esthetic perceptions also affect the treatment they will perform.[36–38] Therefore, groups with different experiences were evaluated in this study. Dental students showed lower OES scores than the other groups in all items. Generally, dentists tend to have a more serious perception of esthetics than patients and the general population.[32] However, it has been reported that students in the first years of dental education have similar perceptions to laypeople.[39] According to our findings, tooth color ranked lowest across all groups, with the lowest results observed among dental students. It can be speculated that dental students held a stronger preference for white teeth compared with experienced dentists.[40] As dentists' professional experience increases, their awareness of the appearance of teeth is likely to increase as they understand the color characteristics of tooth structure, the physiological process of color change, and the "natural" tooth color.[39] Also, it should be noted that the students in the present study are Generation Z, while experienced dentists are Generation Y. A previous study reported that the age at which younger generations consider having esthetic surgery is lower than that of older generations and social media plays a significant role in perception.[41] It is possible that the low OES scores observed among dentistry students can be attributed to the fact that experienced dentists perceive age-related characteristics as natural, while students tend to be influenced more by idealized models.

It is pertinent to highlight that the conducted study has certain limitations. The study did not ascertain whether the participants had undergone any prior orthodontic treatment or esthetic procedure, and the evaluation was based solely on their current state.

5 | CONCLUSION

Within the limitations of this current study, it was concluded that the Orofacial Esthetic Scale-Turkish version showed similar results to previous versions and was found to be a reliable one-dimensional instrument with excellent psychometric properties, and the professional experience duration of dentists had a significant impact on the Orofacial Esthetic Scale-Turkish version scores.

CONFLICT OF INTEREST STATEMENT

The authors did not have any commercial interest in any of the materials used in this study.

DATA AVAILABILITY STATEMENT

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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REFERENCES

1. Kostić M, Ignjatović A, Gligorijević N, et al. Development and psychometric properties of the Serbian version of the Orofacial Esthetic Scale. *J Esthet Restor Dent*. 2023;35(8):1315-1321.
2. Feingold A. Good-looking people are not what we think. *Psychol Bull*. 1992;111(2):304-341.
3. Bimbashi V, Čelebić A, Staka G, Hoxha F, Peršić S, Petričević N. Psychometric properties of the Albanian version of the Orofacial Esthetic Scale: OES-ALB. *BMC Oral Health*. 2015;15:97.
4. Ellis JS, Pelekis ND, Thomason JM. Conventional rehabilitation of edentulous patients: the impact on oral health-related quality of life and patient satisfaction. *J Prosthodont*. 2007;16(1):37-42.
5. Carlsson V, Hakeberg M, Blomkvist K, Wide Boman U. Orofacial esthetics and dental anxiety: associations with oral and psychological health. *Acta Odontol Scand*. 2014;72(8):707-713.
6. Zlatarić DK, Kristek E, Celebić A. Analysis of width/length ratios of normal clinical crowns of the maxillary anterior dentition: correlation between dental proportions and facial measurements. *Int J Prosthodont*. 2007;20(3):313-315.
7. Zlatarić DK, Celebić A. Factors related to patients' general satisfaction with removable partial dentures: a stepwise multiple regression analysis. *Int J Prosthodont*. 2008;21(1):86-88.
8. Kokich VO, Kokich VG, Kiyak HA. Perceptions of dental professionals and laypersons to altered dental esthetics: asymmetric and symmetric situations. *Am J Orthod Dentofacial Orthop*. 2006;130(2):141-151.
9. Kokich VO Jr, Kiyak HA, Shapiro PA. Comparing the perception of dentists and lay people to altered dental esthetics. *J Esthet Dent*. 1999;11(6):311-324.
10. Mehl CJ, Harder S, Kern M, Wolfart S. Patients' and dentists' perception of dental appearance. *Clin Oral Investig*. 2011;15:193-199.
11. Van der Geld P, Oosterveld P, Van Heck G, Kuijpers-Jagtman AM. Smile attractiveness. Self-perception and influence on personality. *Angle Orthod*. 2007;77:759-765.
12. Campos LA, Marôco J, John MT, Santos-Pinto A, Campos JADB. Development and psychometric properties of the Portuguese version of the Orofacial Esthetic Scale: OES-Pt. *PeerJ*. 2020;8:e8814.
13. Slade GD, Spencer AJ. Development and evaluation of the oral health impact profile. *Community Dent Health*. 1994;11:3-11.
14. Reissmann DR, Benecke AW, Aarabi G, Sierwald I. Development and validation of the German version of the Orofacial Esthetic Scale. *Clin Oral Investig*. 2015;19(6):1443-1450.
15. Fernandes MJ, Ruta DA, Ogden GR, Pitts NB, Ogston SA. Assessing oral health-related quality of life in general dental practice in Scotland: validation of the OHIP-14. *Community Dent Oral Epidemiol*. 2006;34(1):53-62.
16. Başol ME, Karaağaçlıoğlu L, Yılmaz B. Türkçe Ağız Sağlığı Etki Ölçeğinin Geliştirilmesi-OHIP-14-TR. *Turkiye Klinikleri J Dental Sci*. 2014;20(2):85-92.
17. Wong AH, Cheung CS, McGrath C. Developing a short form of oral health impact profile (OHIP) for dental aesthetics: OHIP-aesthetic. *Community Dent Oral Epidemiol*. 2007;35:64-72.
18. Mehl C, Kern M, Freitag-Wolf S, Wolfart M, Brunzel S, Wolfart S. Does the oral health impact profile questionnaire measure dental appearance? *Int J Prosthodont*. 2009;22:87-93.
19. Larsson P, John MT, Nilner K, Bondemark L, List T. Development of an orofacial esthetic scale in prosthodontic patients. *Int J Prosthodont*. 2010;23(3):249-256.
20. Persic S, Milardovic S, Mehulic K, Celebic A. Psychometric properties of the Croatian version of the Orofacial Esthetic Scale and suggestions for modification. *Int J Prosthodont*. 2011;24(6):523-533.

21. Rella E, De Angelis P, Nardella T, D'Addona A, Manicone PF. Development and validation of the Italian version of the Orofacial Esthetic Scale (OES-I). *Clin Oral Investig*. 2023;27(3):1055-1062.
22. Alhajj MN, Amran AG, Halboub E, al-Basmi AA, al-Ghabri FA. Development, validation and psychometric properties of the Arabic version of the Orofacial Esthetic Scale: OES-Ar. *J Prosthodont Res*. 2017;61:290-296.
23. Zhao Y, He SL. Development of the Chinese version of the Oro-facial Esthetic Scale. *J Oral Rehabil*. 2013;40:670-677.
24. Wetselaar P, Koutris M, Visscher CM, Larsson P, John MT, Lobbezoo F. Psychometric properties of the Dutch version of the Orofacial Esthetic Scale (OES-NL) in dental patients with and without self-reported tooth wear. *J Oral Rehabil*. 2015;42:803-809.
25. N'Guyen-Van TL, Moreau N, Braud A. Development and validation of the French version of the Orofacial Esthetic Scale. *Int J Prosthodont*. 2019;32:137-142.
26. Campos LA, Kamarainen M, Silvola AS, Marôco J, Peltomäki T, Campos JADB. Orofacial esthetic scale and psychosocial impact of dental aesthetics questionnaire: development and psychometric properties of the Finnish version. *Acta Odontol Scand*. 2021;79:335-343.
27. Costello AB, Osborne J. Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Pract Assess Res Eval*. 2005;10:7.
28. Streiner D, Norman GR, Cairney J. *Health Measurement Scales: a Practical Guide to their Development and Use*. 5th ed. Oxford University Press; 2015.
29. Bland JM, Altman DG. Cronbach's alpha. *BMJ*. 1997;314(7080):572.
30. Shrout PE, Fleiss JL. Intraclass correlations: uses in assessing rater reliability. *Psychol Bull*. 1979;86:420-428.
31. Terwee CB, Bot SD, de Boer MR, et al. Quality criteria were proposed for measurement properties of health status questionnaires. *J Clin Epidemiol*. 2007;60:34-42.
32. Clark LA, Watson D. Constructing validity: basic issues in objective scale development. *Psychol Assess*. 1995;7(3):309-319.
33. Larsson P, Bondemark L, Häggman-Henrikson B. The impact of orofacial appearance on oral health-related quality of life: a systematic review. *J Oral Rehabil*. 2021;48(3):271-281.
34. Slade GD, Spencer AJ. Social impact of oral conditions among older adults. *Aust Dent J*. 1994;39(6):358-364.
35. Pattanaik S, John MT, Chung S, Keller S. Comparison of two rating scales with the orofacial esthetic scale and practical recommendations for its application. *Health Qual Life Outcomes*. 2022;20(1):131.
36. Thomas M, Reddy R, Reddy BJ. Perception differences of altered dental esthetics by dental professionals and laypersons. *Indian J Dent Res*. 2011;22(2):242-247.
37. Musskopf ML, Rocha JM, Rösing CK. Perception of smile esthetics varies between patients and dental professionals when recession defects are present. *Braz Dent J*. 2013;24(4):385-390.
38. Al-Saleh SA, Al-Shammery DA, Al-Shehri NA, Al-Madi EM. Awareness of dental esthetic standards among dental students and professionals. *Clin Cosmet Investig Dent*. 2019;11:373-382.
39. Al-Saleh S, Abu-Raisi S, Almajed N, Bukhary F. Esthetic self-perception of smiles among a group of dental students. *Int J Esthet Dent*. 2018;13(2):220-230.
40. Carlsson GE, Wagner IV, Odman P, et al. An international comparative multicenter study of assessment of dental appearance using computer-aided image manipulation. *Int J Prosthodont*. 1998;11(3):246-254.
41. Fabi S, Alexiades M, Chatrath V, et al. Facial aesthetic priorities and concerns: a physician and patient perception global survey. *Aesthet Surg J*. 2022;42(4):NP218-NP229.

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