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ORIGINAL ARTICLE

SELF-PERCEPTION OF SMILE AESTHETICS AND ORAL HEALTH-RELATED QUALITY OF LIFE IN PERUVIAN ADOLESCENTS

Autopercepción de la estética de la sonrisa y calidad de vida relacionada con la salud bucal en adolescentes peruanos

Nicholle Pérez-Pérez,[1] Diana Choque-Ccalle,[1] Julissa Dulanto-Vargas,[2] Katty Ríos-Villasis.[2]

1. Carrera de Estomatología, Universidad Científica del Sur. Lima, Perú.
2. Research Group in Dental Sciences, Carrera de Estomatología, Universidad Científica del Sur. Lima, Perú.

ABSTRACT

Objetive: To assess how adolescents' self-perception of smile aesthetics (SSA) is related to their oral health–related quality of life (OHRQoL).

Material and Methods: Cross-sectional analytical study carried out in a sample of 270 adolescents from 12 to 18 years old (mean age: 14.91 ± 1.98) attending a public school in Lima, Peru. Two questionnaires on the Smile Perception Impact-related Quality of Life (SPIRQoL) and the Oral Health Impact Profile (OHIP-14) were translated and adapted demonstrating their validity (Kaiser-Meyer-Olkin ≥ 0.9; Bartlett Test $p< 0.001$) and reliability (α ≥ 0.893) before being applied in person. The Mann-Whitney U, Chi square and Spearman correlation statistical tests were used to examine variable relationships at $p<0.05$.

Results: The majority of adolescents had a positive SSA (88.9%) and a low OHIP-14 score (58.5%). The SPIRQoL score was 13 [IQR = 14] and the OHIP-14 score was 5 [IQR = 12]. The SPIRQoL score was not associated with age ($p\geq 0.05$) but was higher in women than in men ($p= 0.025$). The OHIP-14 score was similar by sex and age. A high positive correlation was found between the total and the partial scores adjusted for sex and age between the SPIRQoL and the OHIP-14 (rho = 0.665 - 0.666; $p< 0.01$).

Conclusions: SSA and OHRQoL in adolescents were found to be highly related, regardless of sex and age.

Keywords: *Adolescent; Dental esthetics; Oral health; Quality of life; Self concept; Peru*

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Corresponding Author: Katty Ríos Villasis. Jr. Mogaburos 124 - Jesús María, Lima, Perú.
E-mail: kriosv@científica.edu.pe, drakattyrios@gmail.com

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RESUMEN

Objetivo: Relacionar la autopercepción de la estética de la sonrisa (SSA) y la calidad de vida relacionada con la salud bucal (OHRQoL) en adolescentes.

Material y métodos: Estudio analítico transversal realizado en una muestra de 270 adolescentes de 12 a 18 años (edad media: 14,91 ± 1,98) que asisten a un colegio público de Lima, Perú. Dos cuestionarios sobre la Calidad de Vida Relacionada con el Impacto de la Percepción de la Sonrisa (SPIRQoL) y el Perfil de Impacto en la Salud Bucal (OHIP-14) fueron traducidos y adaptados demostrando su validez (Kaiser-Meyer-Olkin ≥0,9; Prueba de Bartlett p<0,001) y fiabilidad (α≥0,893) antes de ser aplicados presencialmente. Se utilizaron las pruebas estadísticas U de Mann-Whitney, Chi cuadrado y correlación de Spearman para examinar las relaciones entre las variables a p<0,05

Resultados: La mayoría de los adolescentes tenían una SSA positiva (88,9%) y una puntuación baja en el OHIP-14 (58,5%). La puntuación SPIRQoL fue de 13 [RIC = 14] y la puntuación OHIP-14 fue de 5 [RIC = 12]. La puntuación SPIRQoL no se asoció con la edad (p≥ 0,05) pero fue mayor en mujeres que en hombres (p=0,025). La puntuación OHIP-14 fue similar por sexo y edad. Se encontró una alta correlación positiva entre las puntuaciones totales y parciales ajustadas por sexo y edad entre el SPIRQoL y el OHIP-14 (rho = 0,665 - 0,666; p<0,01).

Conclusiones: Se encontró que la SSA y la OHRQoL en adolescentes estaban altamente relacionadas, independientemente del sexo y la edad.

Palabras clave: *Adolescente; Estética dental; Salud bucal; Calidad de vida; Autoimagen; Perú*

INTRODUCTION

The smile in relative harmony with the hard and soft tissues of the oral cavity plays a fundamental role in facial expression and is an external sign of good physical and even socio-emotional health.[1] Adolescence is impacted by dental appearance as complex changes occur in development towards maturity.[2] Constant self-assessment can lead to a risk of insecurity in behaviors, emitting a negative or positive perception regarding oral health (OH).[3,4]

Self-perception of health is a predictor of morbidity and mortality that includes conscious and organized concepts of individuals about themselves. This interpretation may be subject to the influences of lifestyles[5] and may explore more specific aspects such as the smile.

Self-perception of smile aesthetics (SSA) varies according to age, sex and psycho-social-cultural needs. Dental, gingival and occlusal al-terations can impact self-esteem and quality of life (QoL), particularly in the adolescent population.[2,6]

Ideal occlusion is a key objective of dental treatment: However, assessing a patient's aesthetic satisfaction is also relevant. This point is complicated because people vary in their ways of perceiving aesthetics relevant since the self-perception of aesthetics varies in each individual.[7] A common instrument for determining SSA is the use of the Visual Analog Scale with photographs and questionnaires that include the Dental Aesthetic Index (DAI), Oral Aesthetic Subjective Impact Scale (OASIS), Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) and Aesthetic Component of the

Index of Orthodontic Treatment Need (IOTN-AC).[2,8] Previous studies have reported more negative[9-12] than positive results[13,14] in the adolescent population.

Oral health-related quality of life (OHRQoL) is a multidimensional construct that encompasses physical and psychosocial aspects that cannot be assessed clinically. There are several conventional questionnaires that measure the effects of oral health on the QoL of adolescents, such as the Children's Perceptions Questionnaire, Oral Impacts on Daily Functioning, Preschool Oral Health Impact Scale, Child Oral Health Impact Profile, Pediatric Oral Health Quality of Life Scale and Pediatric Oral Health-Related Quality of Life.[3,8,15,16]

OHRQoL assessed by previous studies in adolescents showed a low level compatible with a better QoL[9,12,17] and had a variable impact in relation to satisfaction with the person's appearance related to self-satisfaction with one's appearance.[3,18] The Oral Health Impact Profile (OHIP-14) is a widely used instrument for measuring OHRQoL and has also been applied in adolescents in other studies.[8,16] The OHIP-14 has the advantage of collecting data with less field effort and less work for respondents.[16]

The smile should be assessed from both the functional and aesthetic point of view. For adolescents, minor dental aesthetic irregularity can be a cause for concern. It is necessary to know whether the SSA interacts with QoL, since the study of both would aid in understanding the biopsychosocial vision of dental treatment.[19,20] The purpose of this study was to relate SSA and the OHRQoL in Peruvian adolescents.

MATERIALS AND METHODS

Study design and ethics approval

This cross-sectional analytical study was approved by the Institutional Ethics Committee of the Universidad Científica del Sur (No. 265-CIEI-CIENTÍFICA-2023) and was conducted in accordance with the ethical principles of the Declaration of Helsinki. School permission, written informed consent from parents, and informed assent from adolescents were obtained prior to the study.

Study population and sample

The population consisted of 965 secondary school students enrolled in a public school in Lima in 2023 (Modular code: 0583443, ESCALE-Peru). The sample consisted of 270 adolescents from 12 to 18 years old. The sample size was obtained with the statistical software Epidat v.4.2 according to data from a pilot study with the formula of the lowest significant correlation coefficient unilaterally obtained between the Smile Perception Impact Related Quality of Life (SPIRQoL) and OHIP-14 scores in its dimension 2 (rho=⁻0.234), a confidence level of 99%, a power of 90%, obtaining a result of 265. Convenience sampling was considered until obtaining a similar distribution of participants by sex and age.

SPIRQoL instrument

Self-perception of dental aesthetics was assessed using the SPIRQoL questionnaire developed by Díaz-Cárdenas *et al.*,[21] in Spanish for Colombian adults in 2018.The authors thoroughly revised the questionnaire to adapt the wording to the Peruvian dialect and adolescent participants. The questionnaire includes 15 questions distributed in three dimensions: self-este-em (D1), physical function (D2) and social (D3),

with five Likert-type single-response alternatives: never (0 points), almost never (1 point), sometimes (2 points), almost always (3 points) and always (4 points).
The reverses-cored questions are P1 and P7. The score of self-perception ranges from 0 to 60 points and is classified as: negative (0 to 29 points: ≤50%) and positive (30 to 60 points: >50%).[21]

OHIP-14 Instrument

The OHRQoL was assessed using the OHIP-14 questionnaire developed by Slade in English for older Australian adults in 1997.[13] The authors translated the questions and revised other versions of the Spanish version until the wording was adapted for adolescent participants.

The questionnaire includes 14 questions distributed in seven dimensions: limitation of function (D1), physical pain (D2), psychological distress (D3), physical disability (D4), psychological disability (D5), social disability (D6) and handicap (D7), with five single-response Likert-type alternatives: never (0 points), almost never (1 point), occasionally (2 points), frequently (3 points) and very frequently (4 points). All the questions were reverse scored. The OHRQoL ranges from 0 to 56 points and is classified as low (100% of responses ≤ 2) and high (at least one response ≥ 3).[22]

Validation and reliability of the instrument
The SPIRQoL and OHIP-14 questionnaires (Supplementary material) were evaluated by three dentists with clinical and teaching experience according to 10 indicators: clarity, objectivity, timeliness, organization, sufficiency, relevance, consistency, analysis, strategy and application, obtaining a very good to excellent rating in each of the items. A pilot study was conducted in 75 secondary school students from a public school different from the study sample (modular code: No. 0328146, ESCALE-Peru), with a similar distribution of sex and age. The data obtained underwent exploratory factor analysis with Kaiser-Meyer-Olkin (SPIRQoL = 0.925 and OHIP-14 = 0.900) and Bartlett's Sphericity Test (SPIRQoL and OHIP-14: $p<$ 0.001) resulting in validity. Cronbach's alpha reliability was good to excellent (SPIRQoL = 0.908 and OHIP-14 = 0.893).

Statistical Analysis

Descriptive statistics included frequencies, percentages, medians and interquartile ranges [IQR]. Nonparametric statistics included the Mann-Whitney U test, Chi square and Spearman correlation and partial control of the variables sex and age was used to evaluate variable relationships.
The RHO values ranged from: null (0), very low (0.01–0.19), low (0.2–0.39), mode-rate (0.4–0.59), high (0.6–0.79), very high (0.8–0.99) and perfect (0.1).
The data was analyzed with the statistical program IBM-SPSS version 26 at a significance level of 95%.

RESULTS

The distribution by sex and age of the study sample is presented in Table 1. The participants had a mean age of 14.91 ± 1.98 years and the males were significantly older (15.21 ± 1.88 years) than the females (14.61 ± 2.03 years) (p = 0.013). The total score and sex distribution was similar by age groups (p = 0.988 and 0.134; respectively).

Comparison of the SPIRQoL and OHIP-14 scores by age and sex is shown in Table 2. The total score of SPIRQoL was 13 [IQR = 14], being highest in D1 with a value of 7 [IQR = 6]), while that of OHIP-14 was 8 [IQR = 12], being highest in D3 with a value of 2 [IQR = 4]).

Table 1.
Demographic characteristics of the adolescents included in the study.

Variable	Female (n = 137)		Male (n = 133)		Total (n = 270)	
	n	%	n	%	n	%
Age (mean ± SD)	14.61 ± 2.03		15.21 ± 1.88		14.91 ± 1.98	
12 years old	27	67.5	13	32.5	40	14.8
13 years old	24	60.0	16	40.0	40	14.8
14 years old	20	50.0	20	50.0	40	14.8
15 years old	17	42.5	23	57.5	40	14.8
16 years old	19	47.5	21	52.5	40	14.8
17 years old	13	37.1	22	62.9	35	13.0
18 years old	17	48.6	18	51.4	35	13.0

Table 2.
Comparison of the SPIRQoL and OHIP-14 scores by dimensions according to age and sex.

Main variables		Total Me [IQR]	Age rho (*p*-value†)	Female (n = 137) Me [IQR]	Male (n = 133) Me [IQR]	*p*-value‡
SPIRQoL	Total (0-60 points)	13 [14]	0.025 (NS)	15 [16]	12 [13]	0.025*
	D1 (0-20 points)	7 [6]	0.033 (NS)	8 [6]	6 [5]	0.001*
	D2 (0-20 points)	4 [6]	0.000 (NS)	4 [5]	4 [6]	0.151
	D3 (0-20 points)	2 [5]	0.015 (NS)	2 [6]	2 [5]	0.184
OHIP-14	Total (0-56 points)	8 [12]	-0.009 (NS)	9 [12]	7 [11]	0.279
	D1 (0-8 points)	1 [2]	0.026 (NS)	1 [2]	1 [2]	0.963
	D2 (0-8 points)	23]	-0.014 (NS)	23]	23]	0.676
	D3 (0-8 points)	2 [4]	0.004 (NS)	3 [3]	23]	0.017*
	D4 (0-8 points)	0 [2]	0.070 (NS)	0 [2]	0 [2]	0.719
	D5 (0-8 points)	1 [2]	-0.018 (NS)	1 [2]	0 [2]	0.076
	D6 (0-8 points)	0 [2]	0.029 (NS)	0 [2]	0 [2]	0.923
	D7 (0-8 points)	0 [2]	-0.018 (NS)	0 [2]	0 [2]	0.517

Me: Mean. **IQR:** interquartile range. **Rho:** correlation coefficient. **†:** Spearman correlation test. **‡:** Mann-Whitney U test. NS (not significant). ***:** p< 0.05.

Table 3.
Comparison of the SPIRQoL and OHIP-14 scores by dimensions according to age and sex.

SPIRQoL	Total, n (%)		Female, n (%)		Male, n (%)		*p*-value†
	Negative	Positive	Negative	Positive	Negative	Positive	
Total (0-60 points)	30 (11.1)	240 (88.9)	17 (12.4)	120 (87.6)	13 (9.8)	120 (90.2)	0.491
D1 (0-20 points)	74 (27.4)	196 (72.6)	49 (35.8)	88 (64.2)	25 (18.8)	108 (81.2)	0.002*
D2 (0-20 points)	32 (11.9)	238 (88.1)	18 (13.1)	119 (86.9)	14 (10.5)	119 (89.5)	0.507
D3 (0-20 points)	28 (10.4)	242 (89.6)	13 (9.5)	124 (90.5)	15 (11.3)	118 (88.7)	0.630

SPIRQoL assessment negative <50% and positive ≥50%. **†:** Chi square test. **p*< 0.05.

Table 4.
Comparison of the SPIRQoL and OHIP-14 scores by dimensions according to age and sex.

SPIRQoL	Total, n (%)		Female, n (%)		Male, n (%)		*p*-value†
	Low	High	Low	High	Low	High	
Total (0-56 points)	158 (58.5)	112 (41.5)	75 (54.7)	62 (45.3)	83 (62.4)	50 (37.6)	0.201
D1 (0-8 points)	241 (89.3)	29 (10.7)	122 (89.1)	15 (10.9)	119 (89.5)	14 (10.5)	0.911
D2 (0-8 points)	237 (87.8)	33 (12.2)	120 (87.6)	17 (12.4)	117 (88)	16 (12)	0.924
D3 (0-8 points)	189 (70)	81 (30)	92 (67.2)	45 (32.8)	97 (72.9)	36 (27.1)	0.300
D4 (0-8 points)	250 (92.6)	20 (7.4)	130 (94.9)	7 (5.1)	120 (90.2)	13 (9.8)	0.143
D5 (0-8 points)	236 (87.4)	34 (12.6)	116 (84.7)	21 (15.3)	120 (90.2)	13 (9.8)	0.169
D6 (0-8 points)	246 (91.1)	24 (8.9)	124 (90.5)	13 (9.5)	122 (91.7)	11 (8.3)	0.725
D7 (0-8 points)	249 (92.2)	21 (7.8)	126 (92)	11 (8)	123 (92.5)	10 (7.5)	0.876

OHIP-14 rating score: low with 100% responses ≤2 and high with at least one response ≥3. †Chi square test. *p< 0.05.

Table 5.
Correlation of SPIRQoL and OHIP-14 in the study sample.

OHIP-14 *versus* SPIRQoL		SPIRQoL Total	SPIRQoL D1	SPIRQoL D2	SPIRQoL D3
Total	OHIP-14 Total	0.666**H	0.546**M	0.641**H	0.555**M
	OHIP-14 D1	0.457**M	0.323**L	0.469**M	0.427**M
	OHIP-14 D2	0.361**L	0.291**L	0.356**L	0.291**L
	OHIP-14 D3	0.561**M	0.546**M	0.486**M	0.437**M
	OHIP-14 D4	0.419**M	0.298**L	0.424**M	0.376**L
	OHIP-14 D5	0.665**H	0.554**M	0.622**H	0.562**M
	OHIP-14 D6	0.516**M	0.386**L	0.536**M	0.430**M
	OHIP-14 D7	0.512**M	0.373**L	0.519**M	0.476**M
Control: sex variable	OHIP-14 Total	0.666**H	0.577**M	0.654**H	0.549**M
	OHIP-14 D1	0.419**M	0.327**L	0.479**M	0.321**L
	OHIP-14 D2	0.322**L	0.306**L	0.350**L	0.206**L
	OHIP-14 D3	0.571**M	0.553**M	0.522**M	0.444**M
	OHIP-14 D4	0.417**M	0.356**L	0.406**M	0.352**L
	OHIP-14 D5	0.642**H	0.557**M	0.599**M	0.554**M
	OHIP-14 D6	0.504**M	0.398**L	0.500**M	0.451**M
	OHIP-14 D7	0.574**M	0.466**M	0.544**M	0.522**M
Control: age variable	OHIP-14 Total	0.665**H	0.574**M	0.654**H	0.549**M
	OHIP-14 D1	0.413**M	0.317**L	0.477**M	0.319**L
	OHIP-14 D2	0.316**L	0.296**L	0.346**L	0.204**L
	OHIP-14 D3	0.579**M	0.565**M	0.527**M	0.446**M
	OHIP-14 D4	0.411**M	0.344**L	0.404**M	0.350**L
	OHIP-14 D5	0.646**H	0.564**M	0.603**H	0.556**M
	OHIP-14 D6	0.501**M	0.391**L	0.499**M	0.451**M
	OHIP-14 D7	0.567**M	0.454**M	0.540**M	0.521**M

Spearman correlation test with rho values from: null (0), very low (0.01–0.19), low (0.2–0.39), moderate (0.4–0.59), high (0.6–0.79), very high (0.8–0.99) and perfect (1). ****:** p< 0.01. **M:** moderate. **L:** low. **H:** high.

Neither SPIRQoL nor OHIP-14 was associated with age (p>0.05). Females had a positive relationship with SPIRQoL in total and in D1 (p=0.025 and 0.001; respectively) and with OHIP-14 in D3 (p=0.017).

Comparison of the level of SPIRQoL and OHIP-14 by dimensions according to sex are presented in Table 3 and Table 4, respectively. The percentage of positive SPIRQoL ranged from 72.6% to 89.6% in the total score and by dimensions. A positive association with SPIRQoL in D1 was found in males (81.2%) compared to females (64.2%) (p= 0.002). The percentage of low OHIP-14 scores was 58.5% in the total score and ranged from 70% to 92.6% according to dimension. There was no association between OHIP-14 scores and sex (p>0.05).

The correlation of SPIRQoL and OHIP-14, total SPIRQoL and OHIP-14 scores, and adjusted for sex and age is presented in Table 5. OHIP-14 and SPIRQoL were significantly positively correlated in both the total score and by dimensions (p<0.01). The total score and D5 OHIP-14 were highly correlated with total score and D2 SPIRQoL (rho = 0.622 to 0.666; p<0.01). Low correlations were found for OHIP-14 (D2) and SPIRQoL, OHIP-14 (D1, D4, D6, and D7) and SPIRQoL (D1), and OHIP-14 (D4) and SPIRQoL (D3) (rho = 0.291 to 0.386; p<0.01). Other comparisons were moderately correlated (rho = 0.419 to 0.562; p<0.01). The level of correlation increased from low to moderate between SPRIQoL at D1 and OHIP-14 at D7 and decreased from moderate to low between SPRIQoL at D3 and OHIP-14 at D1 when the variables sex and age were controlled.

DISCUSSION

Adolescents in developing countries face multiple determinants of OH that affect the appearance of the smile and QoL. Alterations in the hard and soft tissues of the mouth can affect people's social interactions especially among the adolescent population.[3,5,6,20] The present study corroborated the hypothesis that SSA and SOQoL OHRQoL were related.

The analysis of SSA and SOQoL OHRQoL included the application of the SPIRQoL[21] and OHIP-14[13] questionnaires developed by previous authors. These questionnaires were translated and adapted to the context of the adolescent population of Peru, demonstrating their validity and reliability. The survey was carried out in person, avoiding that the answers be interfered with by technological help or comments from companions.

The SPIRQoL[21] was shown to be useful for the evaluation of SSA in this study. This questionnaire covers three important self-reported aspects of smiling in adolescents: self-esteem, physical function and social impact. This analysis has been little used Few studies have used these two questionnaires in this age group compared to other questionnaires such as DAI,[10] OASIS,[9,12] PIDAQ[13,14] and IOTN-AC.[11]

The SSA level in this study was positive, similar to that found in Saudi[13] and Australian adolescents,[14] however, but differed from the results of studies including Indian,[9] Nigerian,[10] Croatian,[11] and Brazilian adolescents.[12] When the dimensions were assessed in this study, almost 30% of the sample had a negative SSA for self-esteem. The difference in results among studies is likely due to the different approaches each scale uses to assess self-

perception.[7] The SSA found in the present study was not related to age, unlike what was reported in Thailand.[23] Furthermore, higher scores in the total SPIRQoL and the self-esteem dimension were associated with female sex. Some studies in adolescents from different geographical origins (Anglo-Australians, Vietnamese, Iraqis, Greeks, Filipinos, Cambodians,[14] Malaysians,[13] and Spanish[24]) also found differences according to sex. The data indicate that the appearance of the smile has a great influence on the self-esteem and psychological well-being of women. The dentofacial appearance of females impacts self-confidence and beliefs, subsequently affecting their QoL.[24]

The OHRQoL level of Peruvian adolescents was low, consistent with a better QoL, as was reported in India,[9] Brazil,[12] and Malaysia.[17] Of all the dimensions, only physical discomfort had a high level of showed a high relationship with OHRQoL in 30% of the present study sample. The psychological well-being dimension of the OHIP-14 was higher in females than in males. Some studies found that this variable was related to sex[3,17] and age.[3,8,9] The present research found no relationship between age or sex with the total score of OHRQoL, but a significant relationship was found between sex and the dimension of psychological well-being.

The main result of the present study was the high direct correlation between SSA and OHRQoL. The intensities of the correlations differed on comparing low and high dimensions but were always significant. This was also corroborated in adolescents from Australia,[14] India,[9] the United States[19] and Brazil.[12] According to studies in Malaysia[17] and Saudi Arabia,[13] there was a greater impact in the domains of psychological distress and disability, which infers that dental aesthetics is an important factor that can influence self-esteem.[10,20]

In the context of the study, it is shown that the school becomes a strategic place for the promotion and evaluation of OH, where adolescents can be guided to achieve a healthier lifestyle in relation to the results of this study show that schools may be a strategic site for promoting and evaluating OH, guiding adolescents to achieve a healthier lifestyle in relation to OH.[5,12,23]

One of the limitations of this study is that the sample was recruited from a public secondary school, and thus, the results may vary in private educational environments. The different SSA and OHRQoL instruments of previous studies could introduce biases in the analysis of the comparison of the results. Therefore, it is recommended to take into account the control of these variables in future research.

CONCLUSIONS

Within the limitations of this study, it was concluded that adolescents presented a positive level of self-perception of smile aesthetics and a low level of oral health-related quality of life. Both variables were found to be highly correlated, regardless of sex and age.

CONFLICT OF INTERESTS

The authors declare that they have no conflicts of interest.

ETHICS APPROVAL

Ethical approval was obtained from the Institutional Research Ethics Committee of the Universidad Científica del Sur (N°265-CIEI-CIENTÍFICA-2023).

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AUTHORS' CONTRIBUTIONS

Nicholle Pérez-Pérez: Wrote the manuscript and performed data collection in compliance with the requirements for a professional degree in Peru.

Diana Choque-Ccalle: Wrote the manuscript and performed data collection in compliance with the requirements for a professional degree in Peru.

Katty Ríos-Villasis: Contributed to the idea, study design, and writing and editing of the manuscript.

Julissa Dulanto-Vargas: Analyzed the results and writing and critically revised the manuscript.

All authors gave final approval and agreed to be accountable for all aspects of the work.

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ORCID

Nicholle Pérez-Pérez
0000-0002-6895-9176
Diana Choque-Ccalle
0000-0002-5391-3837
Julissa Dulanto-Vargas
0000-0003-4845-3853
Katty Ríos-Villasis
0000-0001-9764-1100

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Supplementary Table S1.
Questionnaire Spanish Version

Preguntas de satisfacción de la sonrisa (Marca una X por fila)

N°	En el último mes	Nunca	Casi Nunca	Algunas veces	Casi Siempre	Siempre
1	¿La sonrisa que tiene actualmente te confiere satisfacción y seguridad?					
2	¿Alguna vez has sentido vergüenza por tu sonrisa?					
3	¿Te has sentido cohibido al sonreír porque te desagrada el color de tus dientes?					
4	¿Has sentido que los demás te observan mal porque tu sonrisa no es agradable?					
5	¿Piensas que las sonrisas de las otras personas son más bonitas que la tuya?					
6	¿Alguna mal posición de tus dientes te ha generado un obstáculo físico para sonreír?					
7	¿Estás conforme con la forma y tamaño de tus labios y encías?					
8	¿En ocasiones evitas sonreír porque el tamaño de tus dientes es inadecuado?					
9	¿Se te ha dificultado la pronunciación dealgunas palabras por malposición de tus dientes?					
10	¿Has presentado dolor en tus dientes o encías al sonreír?					
11	¿Te has sentido ofendido o discriminado por la apariencia de su sonrisa?					
12	¿Has adoptado posturas o hábitos para esconder tu sonrisa?					
13	¿Has sentido que por tu sonrisa se te han limitado las oportunidades de tener amigos?					
14	¿Has sentido que por tu sonrisa se han limitado tus relaciones interpersonales?					
15	¿Tu sonrisa ha sido una limitante en tu vida familiar?					

Preguntas de salud oral (Marca una X por fila)

N°	En el último mes	Nunca	Casi Nunca	Algunas veces	Casi Siempre	Siempre
1	¿Has tenido dificultad para pronunciar palabras, por problemas en tus dientes o boca?					
2	¿El sabor de tus alimentos ha empeorado por problemas en tus dientes o boca?					
3	¿Has sentido dolor en tus dientes o boca?					
4	¿Has presentado molestias al comer?					
5	¿Te preocupan los problemas en tus dientes o boca?					
6	¿Te has sentido nervioso o estresado por problemas en tus dientes o boca?					
7	¿Has tenido que cambiar tus alimentos, por problemas en tus dientes o boca?					
8	¿Has tenido que interrumpir tus alimentos por problemas en tus dientes o boca?					
9	¿Tienes dificultad para descansar por problemas en tus dientes o boca?					

N°	En el último mes	Nunca	Casi Nunca	Algunas veces	Casi Siempre	Siempre
10	¿Te has sentido avergonzado por problemas en tus dientes o boca?					
11	¿Has estado irritable debido a problemas en tus dientes o boca?					
12	¿Tienes dificultad para hacer tus actividades diarias por problemas en tus dientes o boca?					
13	¿Has sentido que la vida en general es menos agradable por problemas en tus dientes o boca?					
14	¿Las molestias en tus dientes o boca, te han impedido hacer tu vida normal?					

Supplementary Table S1.
Questionnaire English Version

Smile Satisfaction Questions (Mark one X per row)

N°	In the last month	Never	Almost Never	Sometimes	Almost Always	Always
1.	Does your current smile make you feel confident and secure?					
2.	Have you ever felt embarrassed about your smile?					
3.	Have you felt uncomfortable smiling because you dislike the color of your teeth?					
4.	Have you felt that people stare at you because your smile is not pleasant?					
5.	Do you think other people's smiles look better than yours?					
6.	Has the position of your teeth physically interfered with your ability to smile?					
7.	Are you satisfied with the shape and size of your lips and gums?					
8.	Do you sometimes avoid smiling because the size of your teeth is inadequate?					
9.	Is your pronunciation affected by misalignment of your teeth?					
10.	Have you experienced pain in your teeth or gums when smiling?					
11.	Have you felt offended or discriminated against because of the appearance of your smile?					
12.	Have you adopted postures or habits to hide your smile?					
13.	Have you felt that your smile has limited your opportunities to make friends?					
14.	Have you felt that your smile has limited your interpersonal relationships?					
15.	Has your smile been a limitation in your family life?					

Oral Health Questions (Mark one X per row)

N°	In the last month	Never	Almost Never	Sometimes	Almost Always	Always
1.	Have you had difficulty pronouncing words because of problems with your teeth or mouth?					
2.	Has the taste of food worsened due to problems with your teeth or mouth?					
3.	Have you felt pain in your teeth or mouth?					
4.	Have you experienced discomfort when eating?					
5.	Are you worried about the problems in your teeth or mouth?					
6.	Have you felt nervous or stressed because of problems with your teeth or mouth?					
7.	Have you had to change your diet because of problems with your teeth or mouth?					
8.	Have you had to stop eating because of problems with your teeth or mouth?					
9.	Have you had difficulty resting because of problems with your teeth or mouth?					
10.	Have you felt embarrassed about problems with your teeth or mouth?					
11.	Have you been irritable because of problems with your teeth or mouth?					
12.	Have you had difficulty doing your daily activities because of problems with your teeth or mouth?					
13.	Have you felt that life in general is less enjoyable due to problems with your teeth or mouth?					
14.	Have the problems in your teeth or mouth interfered with your normal life?					