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HEALTH LITERACY, SELF-REPORTED ORAL HEALTH, AND ORAL HEALTH–RELATED QUALITY OF LIFE AMONG ADOLESCENTS IN SAN FABIÁN, CHILE, 2023

Alfabetización en salud, salud oral autoevaluada y calidad de vida de la salud oral en adolescentes de San Fabián, Chile 2023

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ABSTRACT

Introduction: Health literacy, the ability to access, understand, evaluate, and apply relevant information, plays a key role in making informed decisions about health. Promoting health literacy from early childhood may help reduce disparities in oral health. This study aimed to examine the relationship between health literacy, perceived oral health, and oral health-related quality of life among adolescents in San Fabián, Chile.

Material and Methods: A cross-sectional, correlational study was conducted involving 122 adolescents aged 15 to 19 years, selected through stratified sampling. Health literacy and oral health–related quality of life were assessed using the HLS-EU-Q16 and OHIP-14 questionnaires, respectively. Perceived oral health was measured using a single validated question. The strength of the relationships between variables was evaluated through correlation analysis.

Results: A total of 62.3% of adolescents showed inadequate and problematic levels of health literacy. Despite reporting good brushing habits, gaps were identified in flossing and regular dental visits. Health literacy was positively associated with perceived oral health and oral health-related quality of life.

Conclusions: This study highlighted the importance of improving health literacy among adolescents in a rural area. It is suggested that health promotion efforts and dental services be tailored to the health literacy levels of Chilean youth to enhance their oral health and overall quality of life.

Keywords: *Health literacy; Quality of life; Oral health; Adolescents; Rural areas; Habits.*

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RESUMEN

Introducción: La alfabetización en salud es la capacidad de acceder, comprender, evaluar y aplicar información para tomar decisiones en salud. Su promoción a edad temprana podría reducir las brechas en salud oral. El objetivo de este estudio fue establecer la relación entre alfabetización en salud, salud oral percibida y calidad de vida de la salud oral de adolescentes de San Fabián.

Material y métodos: Se realizó un estudio transversal con carácter correlacional. Se incluyeron 122 adolescentes de 15 a 19 años, mediante muestreo estratificado. Se usaron los cuestionarios HLS-EU-Q16 y OHIP-14 para evaluar la alfabetización en salud y la calidad de vida de la salud oral, respectivamente. Se midió la percepción de salud oral con una pregunta validada. La intensidad de las relaciones entre las variables se estimó por medio de análisis de correlación.

Resultados: El 62,3% de los adolescentes tienen niveles inadecuados y problemáticos de alfabetización en salud. A pesar de tener buenos hábitos de cepillado, hay una brecha en el uso de hilo dental y las consultas dentales regulares. La alfabetización en salud se relacionó positivamente con la salud oral percibida y la calidad de vida de la salud oral.

Conclusiones: Este estudio mostró la importancia de mejorar la alfabetización en salud de los adolescentes de una zona rural. Se sugiere adaptar las acciones de promoción de la salud y los servicios dentales al nivel de alfabetización en salud de los jóvenes chilenos, para favorecer su salud y calidad de vida de la salud oral.

Palabras clave: *Alfabetización en salud; Calidad de vida; Salud bucal; Adolescentes; Medio rural; Hábitos.*

INTRODUCTION

Health literacy is understood as a multidimensional construct that refers to an individual's ability to access, comprehend, evaluate, and apply information across different health contexts and situations.[1] This approach comprises four key dimensions: functional literacy, which involves basic reading and writing skills; interactive literacy, the ability to extract and use information from various sources; critical literacy, which involves the reflective analysis and evaluation of information; and integrative literacy, the capacity to integrate new information with prior knowledge and personal values.[2]

Health literacy has been established as a relevant, independent, and direct determinant of self-rated health.[3] However, to date, its relationship with self-reported oral health outcomes in adolescents remains underexplored in the scientific literature. Some authors using functional measures of oral health literacy have suggested a positive association between health literacy and oral health status in adolescents.[4-6]

Oral diseases are the most prevalent chronic conditions and pose significant public health challenges due to their high incidence and impact on both individuals and society.[7]

According to the most recent Chilean epidemiological study on oral health (8), 62.5% of 12-year-old adolescents have dental caries, 66.9% have gingivitis, 36.5% present moderate or severe dento-maxillary anomalies, and 5% have experienced dental trauma. These data reveal a high prevalence of oral diseases that can adversely affect the health and quality of life of adolescents.

The consequences of poor oral health are diverse, affecting physical, functional, psychological, and social aspects. These include pain, inflammation, and functional problems such as difficulty chewing and communication disorders; the consequences are substantial. Additionally, poor oral health can lead to psychological issues such as low self-esteem and anxiety, as well as social problems such as isolation and discrimination.[9]

Identifying the factors that influence oral health and quality of life is essential, particularly among populations at higher biopsychosocial risk. Adolescents warrant special attention, as they are at a critical stage for developing health-related habits and attitudes that often persist into adulthood. Moreover, they represent a heterogeneous group, with variations in gender, socioeconomic status, educational level, family environment, and cultural background.[10] These differences can lead to inequalities in access, quality, and use of health services, as well as in exposure to risk and protective factors affecting oral health.[9]

Understanding the relationship between general health literacy and oral health-related quality of life is essential for developing effective action plans and policy strategies that address this key health determinant. In this context, the objective of this study was to examine the relationship between health literacy, self-reported oral health, and oral health-related quality of life among adolescents in the district of San Fabián, Ñuble, in 2023.

MATERIALS AND METHODS

Type of study

A cross-sectional, correlational study was conducted.

Sample

Adolescent students from the Jorge Alessandri Rodríguez (JAR) High School in San Fabián, Ñuble, a rural community in southern Chile, participated in the study. The selection criteria included:
a) Being between 15 and 19 years of age, and;
b) Being enrolled in secondary school during the 2023 academic year.
Students with mental or intellectual disabilities that could prevent them from completing the questionnaires were excluded.

Participants were selected using proportional stratified random sampling. Class rolls for high school grades 1 through 4 were used to assign proportional weights to each grade level based on the total number of secondary school students within the target age range. In cases of exclusion, the next student on the class roll was selected.

The estimated sample size consisted of 112 adolescents, based on a correlation effect size of 0.3 between the variables of interest, as indicated by a previous study,[11] and calculated with a 95% confidence level and 90% power.

However, considering the possibility of a 20% non-response rate after obtaining informed consent from parents or guardians, the final sample was adjusted to 134 students. Based on these criteria, 122 adolescents who met the selection requirements were interviewed.

Measuring instruments

a) Sociodemographic questionnaire. This instrument included variables such as gender (male, female), age (in years), type of health insurance (Fonasa [public], Isapre [private], or other), educational level of the responsible adults (no education or incomplete primary, primary, secondary, vocational, undergraduate, or postgraduate), total family income (in Chilean pesos), place of residence (rural, urban), and self-perceived academic performance/achievement (good, satisfactory, poor).

b) Oral Health Care and Health Perception Questionnaire. This section included closed-ended questions about daily toothbrushing frequency (I do not brush my teeth or I brush my teeth occasionally, once a day, twice a day, three or more times a day), use of fluoride toothpaste (yes, no), flossing habits (never, a few days a month, a few days a week, every day), and dental care patterns (never, only when experiencing a problem, occasionally, regularly).

Additionally, two questions assessed self-perceived health: one regarding overall health (How would you rate your overall health status?) and the other regarding oral health (How would you rate your oral health status?), both with response options: very poor, poor, relatively good, good, or very good.

c) Oral Health Impact Profile (OHIP-14) Spanish version.[12] This instrument assesses oral health-related quality of life (OHQoL) and consists of 7 domains: functional limitation, physical pain, psychological distress, psychological disability, physical disability, social disability, and handicap.

Each domain is measured using two items, scored on a five-category Likert scale (4 = never, 3 = almost never, 2 = occasionally, 1 = frequently, and 0 = almost always). The total OHIP-14 score was obtained by summing the responses to all 14 items, yielding a range of 0 to 56 points, with higher scores indicating better oral health-related quality of life. Cronbach's α for this study was 0.963.

d) European Health Literacy Survey short form (HLS-EU-Q16).[13] This instrument assesses health literacy through 16 items that evaluates difficulties in accessing, understanding, evaluating, and applying information to tasks related to decision-making in health care, disease prevention, and health promotion. Each item was rated on a four-point Likert scale (1 = very difficult, 2 = difficult, 3 = easy and 4 = very easy), with an additional option for "I don't know/no answer".

The total score, standardized on a scale from 0 to 50, categorizes health literacy into four levels: "inadequate" (0-25), "problematic" (>25-33), "sufficient" (>33-42), and "excellent" (> 42-50) (14). For the purpose of identifying vulnerable groups, the "inadequate" and "problematic" levels were combined into a single level, termed "limited health literacy" (0–33).[15] Cronbach's α for this study was 0.949.

Data collection procedure

For data collection, authorization was obtained from the headmaster of the JAR High School. Parents were informed about the study during parent meetings, and informed consent was obtained for the participation of underage adolescents. Selected participants who agreed to participate in the study were scheduled for an interview conducted by the researcher, who administered the questionnaires using a mobile device. The questionnaires were hosted on the Survey Monkey platform.

Statistical analysis

Continuous variables were presented as mean ± standard deviation, while categorical variables were expressed as frequencies and percentages. The Kolmogorov-Smirnov test was used to assess normality in data distribution. Depending on the data distribution and the number of groups compared, the Mann-Whitney U test, one-way ANOVA, Kruskal-Wallis test, and Jonckheere-Terpstra test were applied.

Spearman's correlation was used to examine the relationships between the variables of interest. A *p*-value of $p<0.05$ was considered statistically significant. All analyses were performed using Stata 14.0.

Ethical considerations

The research protocol was approved by the Ethics Committee of the Faculty of Dentistry at Universidad de Concepción (CEC No. 08/20). For the participation of adolescents under the legally established age, authorization was obtained from their parents or guardians through the signing of an informed consent form. Both the students and their parents and/or guardians were informed about the confidentiality of the data collected, the voluntary nature of the adolescent's participation, and the scope of the study.

RESULTS

A total of 122 adolescents participated in the study, with a mean age of 17 ± 1.1 years, 51.6% were female. Among the findings, 26.2% of participants reported not knowing their health insurance type, while 71.3% stated they were enrolled in the public health system.

In terms of family structure, 36.9% of adolescents were under the exclusive care of their mothers; 55.7% of the responsible adults had at least completed secondary education. Regarding geographic location, most participants resided in urban areas, accounting for 58.2%. With respect to family income, 50.9% of adolescents reported a household income of less than 450,000 Chilean pesos. Regarding education, 57.4% of participants reported poor academic performance, with a statistically significant difference observed by gender ($p=0.004$).

In terms of health perceptions, 86.1% of adolescents rated their overall health as good or very good. Similarly, 76.2% rated their oral health positively. Regarding oral care habits, 85.2% reported brushing their teeth two to three times a day, and 95.9% used fluoride toothpaste. However, only 21.3% flossed regularly, and just 9% attended dental appointments on a regular basis. A statistically significant difference by gender was observed only in tooth brushing frequency ($p=0.001$) (Table 1).

In terms of oral health-related quality of life, the mean OHIP-14 score was 50.26 ± 8.87. Analysis of the domains revealed that physical pain had the lowest mean score (6.96±1.46), while physical disability had the highest (7.39±1.49) (Table 2). Overall, female participants reported higher scores than males across all domains of the scale; however, the difference was statistically significant only in the psychological disability domain (males: 6.69 ± 1.90; females: 7.43±1.06; $p=0.022$).

An analysis of health literacy prevalence revealed that 62.3% of the sample exhibited inadequate and problematic levels. The highest levels of health literacy (sufficient/excellent) were observed in the health promotion dimension (73.7%), followed by

Table 1.

Sociodemographic characteristics, health perception, and oral health care practices by health literacy levels among adolescents in the district of San Fabián, Chile.

		Health literacy levels					
		General	Inadequate	Problematic	Sufficient	Excellent	*p*-value
Age, mean ± SD, number (%)		17.0±1.1	17.2±1.1	16.7±1.1	16.9±1	17.1±1	0.374
Gender	Male	59 (48.4)	28 (62.2)	11 (35.5)	8 (30.8)	12 (60)	0.186
	Female	63 (51.6)	17 (37.8)	20 (64.5)	18 (69.2)	8 (40)	
Type of health insurance	Does not know	32 (26.2)	15 (33.3)	7 (22.6)	5 (19.2)	5 (25)	0.323
	Fonasa (public)	87 (71.3)	29 (64.4)	24 (77.4)	21 (80.8)	13 (65)	
	Isapre (private)	3 (2.5)	1 (2.2)	0 (00.0)	0 (00.0)	2 (10)	
Lives with	Both parents	70 (57.4)	22 (48.9)	18 (58.1)	16 (61.5)	14 (70)	0.237
	Only with his/ her mother	45 (36.9)	20 (44.4)	12 (38.7)	8 (30.8)	5 (25)	
	Other	7 (5.7)	3 (6.7)	1 (3.2)	2 (7.7)	1 (5)	
Educational level of parents or guardians	No studies or incomplete primary education	4 (3.5)	1 (2.5)	2 (6.5)	1 (4.2)	0 (0)	
	Primary (8 years)	28 (24.3)	15 (37.5)	6 (19.4)	4 (16.7)	3 (15)	
	Secondary (4 years)	64 (55.7)	20 (50.0)	20 (64.5)	14 (58.3)	10 (50)	
	Vocational high school (5 years)	4 (3.5)	1 (2.5)	1 (3.2)	2 (8.3)	0 (0)	
	Higher technical education	9 (7.8)	3 (7.5)	2 (6.5)	1 (4.2)	3 (15)	
	Undergraduate	6 (5.2)	0 (0)	0 (0)	2 (8.3)	4 (20)	
Place of residence	Rural	51 (41.8)	25 (55.6)	10 (32.3)	8 (30.8)	8 (40)	0.069
	Urban	71 (58.2)	20 (44.4)	21 (67.7)	18 (69.2)	12 (60.0)	
Family income, (Chilean pesos)	$100,000 - $250,000	3 (2.5)	1 (2.2)	1 (3.2)	1 (3.8)	0 (0)	<0.001
	$250,000 - $450,000	59 (48.4)	29 (64.4)	15 (48.4)	9 (34.6)	6 (30.0)	
	$450,000 - $700,000	30 (24.6)	9 (20.0)	10 (32.3)	7 (26.9)	4 (20.0)	
	$700,000 - $1,000,000	16 (13.1)	5 (11.1)	4 (12.9)	5 (19.2)	2 (10.0)	
	$1,000,000 - $1,500,000	7 (5.7)	0 (0)	1 (3.2)	4 (15.4)	2 (10.0)	
	$1,500,000 – 2,500,000	5 (4.1)	0 (0)	0 (0)	0 (0)	5 (25.0)	
	More than $2,500,000	2 (1.6)	1 (2.2)	0 (0)	0 (0)	1 (5.0)	
Academic achievement/ performance,	Good	10 (8.2)	7 (15.6)	3 (9.7)	0 (0)	0 (0)	<0.001
	Satisfactory	42 (34.4)	22 (48.9)	9 (29.0)	6 (23.1)	5 (25.0)	
	Poor	70 (57.4)	16 (35.6)	19 (61.3)	20 (76.9)	15 (75.0)	
Self-reported overall health,	Does not know	2 (1.6)	2 (4.4)	0 (0)	0 (0)	0 (0)	0.021
	Poor	1 (.8)	0 (0)	1 (3.2)	0 (0)	0 (0)	
	Relatively good	14 (11.5)	9 (20.0)	2 (6.5)	2 (7.7)	1 (5.0)	
	Very good	85 (69.7)	26 (57.8)	25 (80.6)	16 (61.5)	18 (90.0)	
Self-reported oral health,	Does not know	6 (4.9)	6 (13.3)	0 (0)	0 (0)	0 (0)	<0.001
	Poor	4 (3.3)	1 (2.2)	2 (6.5)	0 (0)	1 (5.0)	
	Relatively good	19 (15.6)	12 (26.7)	2 (6.5)	3 (11.5)	2 (10.0)	
	Good	17 (13.9)	8 (17.8)	4 (12.9)	4 (15.4)	1 (5.0)	
	Very good	76 (62.3)	18 (40.0)	23 (74.2)	19 (73.1)	16 (80.0)	

Table 1 continues on the next page →

Table 1.
Sociodemographic characteristics, health perception, and oral health care practices by health literacy levels among adolescents in the district of San Fabián, Chile.

		Health literacy levels					
		General	Inadequate	Problematic	Sufficient	Excellent	*p*-value
Toothbrushing frequency	Never/ occasionally	3 (2.5)	3 (6.7)	0 (0)	0 (0)	0 (0)	0.019
	Once a day	15 (12.3)	7 (15.6)	4 (12.9)	3 (11.5)	1 (5.0)	
	Twice a day	52 (42.6)	19 (42.2)	17 (54.8)	8 (30.8)	8 (40.0)	
	Three or more times a day	52 (42.6)	16 (35.6)	10 (32.3)	15 (57.7)	11 (55.0)	
Frequency of flossing	Never	61 (50.0)	29 (64.4)	17 (54.8)	10 (38.5)	5 (25.0)	<0.001
	A few days a month	17 (13.9)	6 (13.3)	4 (12.9)	4 (15.4)	3 (15.0)	
	A few days a week	18 (14.8)	6 (13.3)	6 (19.4)	4 (15.4)	2 (10.0)	
	Every day	26 (21.3)	4 (8.9)	4 (12.9)	8 (30.8)	10 (50.0)	
Use of fluoride toothpaste	No	5 (4.1)	0 (0)	0 (0)	2 (7.7)	3 (15.0)	0.005
	Yes	117 (95.9)	45 (100.0)	31 (100.0)	24 (92.3)	17 (85.0)	
Frequency of dental visits,	Never	30 (24.6)	17 (37.8)	6 (19.4)	5 (19.2)	2 (10.0)	<0.001
	When experiencing a problem	50 (41.0)	19 (42.2)	21 (67.7)	8 (30.8)	2 (10.0)	
	Occasionally	31 (25.4)	6 (13.3)	4 (12.9)	10 (38.5)	11 (55.0)	
	Regularly	11 (9.0)	3 (6.7)	0 (0)	3 (11.5)	5 (25.0)	

Significant *p*-values are in bold.

Table 2.
General and domain-specific OHIP-14 scores (mean ± SD) by health literacy level among adolescents in the district of San Fabián, Chile.

	Health literacy levels					
	General	Inadequate	Problematic	Sufficient	Excellent	*p*-value
OHIP-14 Total Score	50.26±8.87	47.02±12,23	51.65±5.95	51.50±5.72	53.80±3.46	0.013
Physical limitation	7.34±1.09	7.04±1.40	7.42±0.81	7.38±1.02	7.80±0.41	0.067
Physical pain	6.96±1.46	6.38±1.95	7.13±0.99	7.27±1.00	7.60±0.68	0.004
Psychological distress	7.02±1.42	6.58±1.78	7.19±1.25	7.15±1.08	7.60±0.75	0.036
Physical disability	7.14±1.54	6.60±1.96	7.45±1.26	7.31±1.12	7.65±0.93	0.023
Psychological disability	7.07±1.56	6.60±2.17	7.23±1.06	7.35±0.94	7.55±0.89	0.067
Social disability	7.34±1.48	6.87±2.06	7.58±0.89	7.50±1.14	7.85±0.37	0.041
Handicap	7.39±1.49	6.96±2.09	7.65±0.80	7.54±1.14	7.75±0.72	0.101

Significant *p*-values are in bold.

Table 3.

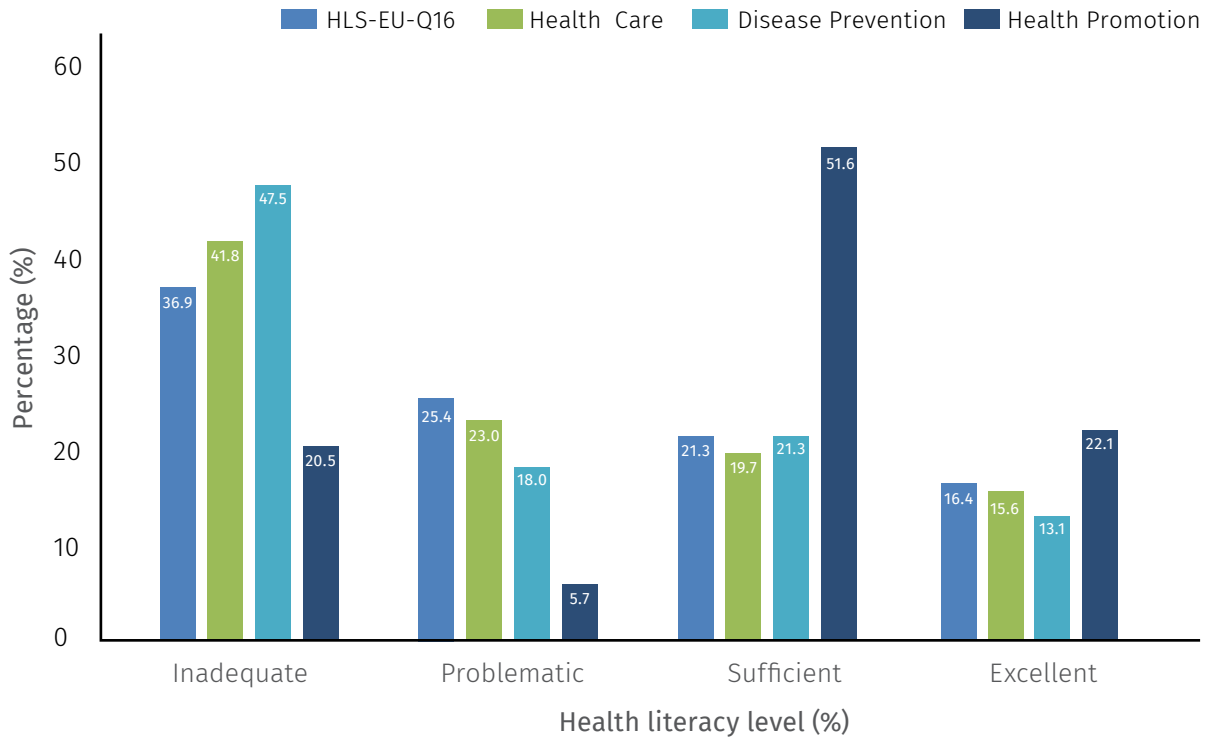
Spearman correlations between health literacy, oral health care, and health perception.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Health Literacy (HLS-EU-Q16)										
(1) General health literacy index	1									
(2) Health care	0.914**	1								
(3) Disease prevention	0.960**	0.813**	1							
(4) Health promotion	0.830**	0.654**	0.766**	1						
Oral health care										
(5) Frequency of toothbrushing	0.220**	0.239**	0.231**	0.09	1					
(6) Frequency of flossing	0.325**	0.375**	0.287**	0.208*	.434**	1				
(7) Use of fluoride toothpaste	-0.268**	-0.280**	-0.218**	-0.282**	-0.114	-0.254**	1			
(8) Frequency of dental visits	0.416**	0.483**	0.363**	0.281**	0.332**	0.436**	-0.318**	1		
Health perception										
(9) Self-reported overall health	0.231**	0.183*	0.251**	.220**	0.332**	0.138	0.018	0.029	1	
(10) Self-reported oral health	0.340**	0.270**	0.331**	.365**	0.371**	0.097	0.01	0.064	0.762**	1
(11) Oral-health related quality of life (OHIP-14)	0.162*	0.148	0.162*	0.088	0.031	-0.101	0.006	0.230**	0.256**	0.321**

Significant *p*-values are in bold.

Figure 1.

Distribution of health literacy levels overall and across the dimensions of health care, disease prevention, and health promotion.



health care (35.3%) and disease prevention (34.4%). These differences are illustrated in Figure 1.

Health literacy levels showed significant differences based on the educational level of parents or guardians (p=0.003), family income (p<0.001), and academic performance (p<0.001). No significant differences were found regarding age, gender, type of health insurance, responsible adult, or place of residence. In terms of health perception, significant differences were found in both self-rated overall health (p=0.021) and oral health (p<0.001). Regarding oral health care behaviors, significant differences were observed in all assessed variables: frequency of toothbrushing (p=0.019), frequency of flossing (p<0.001), use of fluoride toothpaste (p=0.005), and frequency of dental visits (p<0.001) (Table 1).

In the Oral Health Impact Profile (OHIP-14) survey domains, adolescents with limited health literacy reported poorer oral health-related quality of life. On the other hand, adolescents with sufficient health literacy showed improved perceptions of oral health-related quality of life. However, statistically significant differences were observed only in the domains of physical pain (p=0.004), psychological distress (p=0.036), physical disability (p=0.023), and social disability (p=0.041), Table 2.

Bivariate analyses showed significant positive correlations between health literacy and self-rated overall health (r=0.231; p<0.01), oral health (r=0.340; p<0.01), and oral health-related quality of life (r=0.162; p<0.05). Oral health-related quality of life was also positively associated with self-rated overall health (r=0.256; p<0.01), oral health (r=0.321; p<0.01), and the disease prevention dimension (r=0.162; p<0.05), but not with the to the other dimensions of health literacy (health care and health promotion), as detailed in Table 3.

DISCUSSION

This study contributes to the understanding of the relationship between health literacy and self-reported oral health outcomes in adolescents, an area that has been underexplored to date. Previous studies have focused on functional literacy, using tools derived from general health assessments without clearly defined cut-offs points, making comparison and the identification of consistent patterns difficult. Furthermore, most of these studies have emphasized recognition, pronunciation, and comprehension, without addressing health literacy as a multifaceted construct.[16-18]
Results showed that more than 60% of adolescents have limited health literacy, a figure similar to that reported among Austrian adolescents (58%),[19] but higher than that of adolescents from Spain (44.2%)[20] and Poland (41.4%).[21] These variations may be attributed to differences in educational systems, public health policies, and health promotion campaigns.

Across the health literacy dimensions assessed, the highest scores were observed for health promotion (33.54±12.66), followed by health care (27.19±12.58), and disease prevention (26.49±13.32). This pattern, which aligns with findings from adolescents from Spain.[20] suggests that adolescents are better informed about health promotion, probably due to its greater visibility and accessibility. In contrast, health care and disease prevention, while equally important, may receive less emphasis or require a more advanced level of practical understanding.

Analysis of the relationship between gender and health literacy yielded inconclusive results. Some studies indicate that females tend to have higher health literacy scores,[22,23] but others, including the present study, report no significant differences.[20,21] Future research could consider this perspective to provide a broader and more nuanced understanding of health literacy, as gender norms and roles can shape how health is perceived and managed.

A significant relationship was found between health literacy and perceived educational achievement, suggesting that students may be falling behind not only in formal education but also in reaching their full health potential.[23] This finding aligns with existing literature, which highlights a positive association between health literacy and educational achievement.[24] General literacy serves as the foundation for effective health literacy, enabling students to better understand and use health information more efficiently.[1] The observed significant relationship between health literacy and perceived educational achievement underscores the importance of integrating health education into school curricula.

Likewise, a significant relationship was observed between health literacy and various socioeconomic indicators, particularly family income and the educational level of the adults responsible for the adolescents. Consistent with the findings of Paakari *et al.*,[23] parental education and family income emerged as significant predictors of health literacy levels.

Studies involving Brazilian adolescents, despite using different literacy assessment tools, also support these findings,[5,22,25] reaffirming the existence of a social gradient in health literacy, although the mechanisms underlying this association require further exploration.

Regarding oral health behaviors, a significant, although low to moderate, association was found between health literacy and oral health-related behaviors such as toothbrushing frequency, flossing, use of fluoride toothpaste, and frequency of dental visits. Naghibi Sistani *et al.*,[26] found that poor toothbrushing behavior and low health literacy scores were indicators of an elevated risk of self-reported poor oral health. These findings, consistent with other studies,[27,28] reinforce that while health literacy facilitates the adoption of healthy behaviors, it is not the only determinant.

Regarding overall health perception, 86.1% of adolescents rated their health as good or very good, in line with previous studies conducted in diverse cultural contexts. For example, 88.4% of Swedish adolescents reported a positive health perception,[31] and the figure among European adolescents was 84.4%.[29] Participants also expressed a positive assessment of their oral health, with 76.2% describing it as good or very good, surpassing the rates reported by Brazilian adolescents (60.7%)[32] and Japanese students (36.8%-43.6%).[33,34] Despite these results, the findings underscore the need to implement more effective preventive measures and dental care strategies among adolescents to reduce the impact of oral diseases.[5] Furthermore, a positive relationship was found between health literacy and self-perceived overall health in adolescents, consistent with findings from other studies.[23,29,30]

A positive association was also observed with perceived oral health, although this relationship has been less explored in the

literature. Several studies have focused on assessing functional oral health literacy, often using tools adapted from general health assessments. Despite this limitation, evidence suggests a positive association between health literacy and oral health status in this population.[4-6]

In the context of oral health, a moderate association was observed between self-perceived oral health and oral health-related quality of life (OHRQoL), supporting findings from previous studies.[35] OHRQoL, as measured by the OHIP-14, yielded a relatively low mean score (5.74 ± 8.87). These results differ from other studies, such as Colussi *et al.*,[36] (7.25), Yamane-Takeuchi *et al.*,[33] (1.92) and Sun *et al.*,[37] which reported lower values (4.37).

The variability may stem from differences in populations, assessment methodologies, or cultural perceptions. The lack of a strong association between oral health outcomes and quality of life in adolescents suggests that, although chronic conditions such as caries and periodontal disease are prevalent, they may not significantly impact quality of life at these early stages. These conditions often start with few or no obvious symptoms initially, which may contribute to a limited perception of their impact.[36] Nevertheless, their long-term consequences should be considered in a comprehensive health assessment of this population.

This study has several limitations. As a cross-sectional design, it does not allow the establishment of causal relationships. While the sample was adequate for addressing the objectives, a larger sample would enable a more robust exploration of the observed associations. It is also important to highlight the presence of selection bias, as only adolescents attending the specific district school were included, which limits the external validity of the findings. Additionally, since the data were self-reported, there is some risk of response bias, as participants may have provided socially desirable answers. Despite these limitations, this study offers valuable evidence of the relationships between health literacy, sociodemographic characteristics, and self-rated health measurements. Further research in other geographic regions would be beneficial to validate these preliminary findings.

A strength of the study is its rigorous data collection methodology, particularly the assurance of face validity through individual interviews and the use of an internationally validated instrument, which allows for future comparison of results and helps identify at-risk populations. These findings are essential for implementing health education and promotion interventions, emphasizing the need for health systems to adapt to the population's varying levels of health literacy.

CONCLUSIONS

The health literacy of adolescent secondary school students in this rural community is concerning, with over 60% demonstrating limited health literacy levels. This highlights the urgent need to address gaps in comprehensive understanding of health, particularly given its association with academic performance, the educational level of the responsible adults, and family income. The positive relationship between health literacy, perceived oral health, and oral health-related quality of life further emphasizes the importance of developing educational programs and tailoring health strategies to meet the needs of this population.

CONFLICT OF INTERESTS

The authors declare no conflicts of interest.

ETHICS APPROVAL

This study was approved by the Ethics Committee of the Faculty of Dentistry of the University of Concepción.

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AUTHORS' CONTRIBUTIONS

Osvaldo Aránguiz-Genel: Conceptualization, methodology, research, data analysis, writing of the original draft, project administration.

Aldo Vera-Calzaretta: Supervision, validation, formal analysis, visualization, writing: review and editing.

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REFERENCES

1. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, Brand H; (HLS-EU) Consortium Health Literacy Project European. Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health. 2012 Jan 25;12:80. doi: 10.1186/1471-2458-12-80. PMID: 22276600; PMCID: PMC3292515.
2. Nutbeam D. The evolving concept of health literacy. Soc Sci Med. 2008 Dec;67(12):2072-8. doi: 10.1016/j.socscimed.2008.09.050. Epub 2008 Oct 25. PMID: 18952344.
3. Pelikan JM, Ganahl K, Roethlin F. Health literacy as a determinant, mediator and/or moderator of health: empirical models using the European Health Literacy Survey dataset. Glob Health Promot. 2018 Nov 14:1757975918788300. doi: 10.1177/1757975918788300. Epub ahead of print. PMID: 30427258.
4. Neves ÉTB, da Costa Dutra L, de Lima LCM, Perazzo MF, Ferreira FM, Paiva SM, Granville-Garcia AF. Structuring of the effects of oral health literacy on dental caries in 12-year-old adolescents. Community Dent Oral Epidemiol. 2023 Oct;51(5):864-871. doi: 10.1111/cdoe.12777. Epub 2022 Jul 25. PMID: 35879864.
5. Dutra LDC, de Lima LCM, Neves ÉTB, Gomes MC, de Araújo LJS, Forte FDS, Paiva SM, Ferreira FM, Granville-Garcia AF. Adolescents with worse levels of oral health literacy have more cavitated carious lesions. PLoS One. 2019 Nov 27;14(11):e0225176. doi: 10.1371/journal.pone.0225176. PMID: 31774850; PMCID: PMC6880994.
6. Neves ÉTB, Granville-Garcia AF, Dutra LDC, Baccin Bendo C, Ferreira FM, Paiva SM, Horowitz AM. Association of Oral Health Literacy and School Factors with Untreated Dental Caries among 12-Year-Olds: A Multilevel Approach. Caries Res. 2021;55(2):144-152. doi: 10.1159/000514501. Epub 2021 Mar 15. PMID: 33721863.
7. Keles S, Abacigil F, Adana F. Oral health status and oral health related quality of life in adolescent workers. Clujul Med. 2018 Oct;91(4):462-468. doi: 10.15386/cjmed-1027. PMID: 30564025; PMCID: PMC6296728.
8. Soto L, Tapia R, Jara G, Rodríguez G, Urbina T, Venegas C. Diagnóstico nacional de salud bucal del adolescente de 12 años y evaluación del grado de cumplimiento de los objetivos sanitarios de salud bucal 2000-2010. Facultad de Odontología, Universidad Mayor. 2007;
9. Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century--the approach of the WHO Global Oral Health Programme. Community Dent Oral Epidemiol. 2003 Dec;31 Suppl 1:3-23. doi: 10.1046/j..2003.com122.x. PMID: 15015736.
10. Patton GC, Sawyer SM, Santelli JS, Ross DA, Afifi R, Allen NB, Arora M, Azzopardi P, Baldwin W, Bonell C, Kakuma R, Kennedy E, Mahon J, McGovern T, Mokdad AH, Patel V, Petroni S, Reavley N, Taiwo K, Waldfogel J, Wickremarathne D, Barroso C, Bhutta Z, Fatusi AO, Mattoo A, Diers J, Fang J, Ferguson J, Ssewamala F, Viner RM. Our future: a Lancet commission on adolescent health and wellbeing. Lancet. 2016 Jun 11;387(10036):2423-78. doi: 10.1016/S0140-6736(16)00579-1. Epub 2016 May 9. PMID: 27174304; PMCID: PMC5832967.
11. Kandasamy G, Almaghaslah D, Vasudevan R, Shorog E, Alshahrani AM, Alsawaq E, Alzlaiq W, Prabahar K, Veeramani VP, Alshareef H. Assessment of oral health literacy and oral health-related quality of life in Saudi university students: A cross-sectional study. J Oral Rehabil. 2023;50(9):852-859. doi: 10.1111/joor.13520. Epub 2023 Jun 4. PMID: 37232064.
12. Montero-Martín J, Bravo-Pérez M, Albaladejo-Martínez A, Hernández-Martín LA, Rosel-Gallardo EM. Validation the Oral Health Impact Profile (OHIP-14sp) for adults in Spain. Med Oral Patol Oral Cir Bucal. 2009 Jan 1;14(1):E44-50. PMID: 19114956.
13. Nolasco A, Barona C, Tamayo-Fonseca N, Irles MÁ, Más R, Tuells J, Pereyra-Zamora P. Alfabetización en salud: propiedades psicométricas del cuestionario HLS-EU-Q16 [Health literacy: psychometric behaviour of the HLS-EU-Q16 questionnaire]. Gac Sanit. 2020 Jul-Aug;34(4):399-402. Spanish. doi: 10.1016/j.gaceta.2018.08.006. Epub 2018 Nov 22. PMID: 30473252.

14. Sørensen K, Pelikan JM, Röthlin F, Ganahl K, Slonska Z, Doyle G, Fullam J, Kondilis B, Agrafiotis D, Uiters E, Falcon M, Mensing M, Tchamov K, van den Broucke S, Brand H; HLS-EU Consortium. Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). Eur J Public Health. 2015 Dec;25(6):1053-8. doi: 10.1093/eurpub/ckv043. Epub 2015 Apr 5. PMID: 25843827; PMCID: PMC4668324.
15. van der Heide I, Uiters E, Sørensen K, Röthlin F, Pelikan J, Rademakers J, Boshuizen H; EPHORT consortium. Health literacy in Europe: the development and validation of health literacy prediction models. Eur J Public Health. 2016 Dec;26(6):906-911. doi: 10.1093/eurpub/ckw078. Epub 2016 Jun 16. PMID: 27312257.
16. Cartes-Velásquez RA. Literacy in health: conceptual base and evidences in dentistry. MEDISAN. 2015;19(4):562.
17. Dickson-Swift V, Kenny A, Farmer J, Gussy M, Larkins S. Measuring oral health literacy: a scoping review of existing tools. BMC Oral Health. 2014 Dec 4;14:148. doi: 10.1186/1472-6831-14-148. PMID: 25472659; PMCID: PMC4417207.
18. Firmino RT, Martins CC, Faria LDS, Martins Paiva S, Granville-Garcia AF, Fraiz FC, Ferreira FM. Association of oral health literacy with oral health behaviors, perception, knowledge, and dental treatment related outcomes: a systematic review and meta-analysis. J Public Health Dent. 2018 Jun;78(3):231-245. doi: 10.1111/jphd.12266. Epub 2018 Mar 2. PMID: 29498754.
19. Röthlin F, Pelikan J, Ganahl K. Die Gesundheitskompetenz der 15-jährigen Jugendlichen in österreich. Abschlussbericht der österreichischen Gesundheitskompetenz Jugendstudie im Auftrag des Hauptverbands der österreichischen Sozialversicherungsträger (HVSV). 2013.
20. García Martínez C, Ramos Martín MF, Suárez Gil P. Alfabetización en salud y necesidades formativas percibidas por adolescentes en un área de Asturias, un estudio transversal [Health literacy and educational necessities perceived by adolescents in an area of Asturias, a cross-sectional study.]. Rev Esp Salud Publica. 2021;95:e202111183. Spanish. PMID: 34728598.
21. Duplaga M, Grysztar M. Socio-Economic Determinants of Health Literacy in High School Students: A Cross-Sectional Study. Int J Environ Res Public Health. 2021 Nov 21;18(22):12231. doi: 10.3390/ijerph182212231. PMID: 34831987; PMCID: PMC8624924.
22. Lopes RT, Neves ÉTB, Gomes MC, Paiva SM, Ferreira FM, Granville-Garcia AF. Family structure, sociodemographic factors and type of dental service associated with oral health literacy in the early adolescence. Cien Saude Colet. 2021;26(suppl 3):5241-5250. doi: 10.1590/1413-812320212611.3.34782019.
23. Paakkari LT, Torppa MP, Paakkari OP, Välimaa RS, Ojala KSA, Tynjälä JA. Does health literacy explain the link between structural stratifiers and adolescent health? Eur J Public Health. 2019 ;29(5):919-924. doi: 10.1093/eurpub/ckz011. PMID: 30753409.
24. Manganello JA. Health literacy and adolescents: a framework and agenda for future research. Health Educ Res. 2008 Oct;23(5):840-7. doi: 10.1093/her/cym069. PMID: 18024979.
25. Neves ÉTB, Lima LCM, Dutra LDC, Gomes MC, Siqueira MBLD, Paiva SM, Ferreira FM, Granville-Garcia AF. Oral health literacy, sociodemographic, family, and clinical predictors of dental visits among Brazilian early adolescents. Int J Paediatr Dent. 2021 Mar;31(2):204-211. doi: 10.1111/ipd.12660. Epub 2020 May 29. PMID: 32413175.
26. Naghibi Sistani MM, Yazdani R, Virtanen J, Pakdaman A, Murtomaa H. Determinants of oral health: does oral health literacy matter? ISRN Dent. 2013;2013:249591. doi: 10.1155/2013/249591. PMID: 23577262; PMCID: PMC3610341.
27. Cho HA, Im AJ, Sim YR, Jang HB, Lim HJ. The association between oral health literacy and oral health behaviors in North Korean defectors: a cross-sectional study. BMC Public Health. 2020;20(1):1074. doi: 10.1186/s12889-020-08550-7. PMID: 32635907; PMCID: PMC7341630.
28. Lopes RT, Neves ÉTB, Dutra LDC, Gomes MC, Paiva SM, Abreu MHNG, Ferreira FM, Granville-Garcia AF. Socioeconomic status and family functioning influence oral health literacy among adolescents. Rev Saude Publica. 2020 Mar 20;54:30. doi: 10.11606/s1518-8787.2020054001842. PMID: 32215538; PMCID: PMC7069712.

29. Paakkari L, Torppa M, Mazur J, Boberova Z, Sudeck G, Kalman M, Paakkari O. A Comparative Study on Adolescents' Health Literacy in Europe: Findings from the HBSC Study. Int J Environ Res Public Health. 2020 May 19;17(10):3543. doi: 10.3390/ijerph17103543. PMID: 32438595; PMCID: PMC7277198.
30. Guo S, Yu X, Davis E, Armstrong R, Riggs E, Naccarella L. Adolescent Health Literacy in Beijing and Melbourne: A Cross-Cultural Comparison. Int J Environ Res Public Health. 2020 Feb 14;17(4):1242. doi: 10.3390/ijerph17041242. PMID: 32075168; PMCID: PMC7068382.
31. Joffer J, Flacking R, Bergström E, Randell E, Jerdén L. Self-rated health, subjective social status in school and socioeconomic status in adolescents: a cross-sectional study. BMC Public Health. 2019 Jun 20;19(1):785. doi: 10.1186/s12889-019-7140-3. PMID: 31221114; PMCID: PMC6587278.
32. Fagundes MLB, do Amaral Júnior OL, Menegazzo GR, do Nascimento Tôrres LH. Factors associated with self-perceived oral health in different age groups. Community Dent Oral Epidemiol. 2022 Dec;50(6):476-483. doi: 10.1111/cdoe.12673. Epub 2021 Jun 26. PMID: 34176140.
33. Yamane-Takeuchi M, Ekuni D, Mizutani S, Kataoka K, Taniguchi-Tabata A, Azuma T, Furuta M, Tomofuji T, Iwasaki Y, Morita M. Associations among oral health-related quality of life, subjective symptoms, clinical status, and self-rated oral health in Japanese university students: a cross-sectional study. BMC Oral Health. 2016 Nov 30;16(1):127. doi: 10.1186/s12903-016-0322-9. PMID: 27903265; PMCID: PMC5129632.
34. Nakahara M, Toyama N, Ekuni D, Takeuchi N, Maruyama T, Yokoi A, Fukuhara D, Sawada N, Nakashima Y, Morita M. Trends in Self-Rated Oral Health and Its Associations with Oral Health Status and Oral Health Behaviors in Japanese University Students: A Cross-Sectional Study from 2011 to 2019. Int J Environ Res Public Health. 2022 Oct 20;19(20):13580. doi: 10.3390/ijerph192013580. PMID: 36294160; PMCID: PMC9602464.
35. Ghaffari M, Rakhshanderou S, Ramezankhani A, Mehrabi Y, Safari-Moradabadi A. Systematic review of the tools of oral and dental health literacy: assessment of conceptual dimensions and psychometric properties. BMC Oral Health. 2020 Jul 3;20(1):186. doi: 10.1186/s12903-020-01170-y. PMID: 32620108; PMCID: PMC7333397.
36. Colussi PR, Hugo FN, Muniz FW, Rösing CK. Oral Health-Related Quality of Life and Associated Factors in Brazilian Adolescents. Braz Dent J. 2017 Jan-Feb;28(1):113-120. doi: 10.1590/0103-6440201701098. PMID: 28301028.
37. Sun L, Wong HM, McGrath CPJ. The factors that influence oral health-related quality of life in young adults. Health Qual Life Outcomes. 2018 Sep 17;16(1):187. doi: 10.1186/s12955-018-1015-7. PMID: 30223844; PMCID: PMC6142382.