


Health literacy and self-efficacy associations with non-adherence to dental treatment among young adults

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Abstract: The aim of this study was to investigate associations of health literacy (HL), general self-efficacy (GSE), and sociodemographic variables with non-adherence to dental treatment among Brazilian young adults. This is a cross-sectional study based on a cohort study of 248 young adults aged 19 to 25 years followed up in an earlier study. The participants completed the perceived general self-efficacy scale (GSE), a questionnaire on socioeconomic and demographic variables and were examined for oral conditions. HL was measured using the Brazilian version of the health literacy questionnaire (HLQ-Br), which provides nine individual scores based on an average of the items within each of the nine scales. Dental treatment adherence was evaluated as the decision of young adults to seek a dentist to finish the recommended restorative treatment for dental caries. The effects of HL domains on the adherence to dental treatment were analyzed by logistic regression and the effect was adjusted for sex, age, family income, paternal and maternal education, type of housing, and self-efficacy. The results of the adjusted analysis showed associations among young adults who did not adhere to dental treatment with lower self-efficacy levels, living in non-owner-occupied homes, and lower HL levels in almost all of the HL domains ($p < 0.05$). Only the HLQ6 domain “Ability to actively engage with healthcare providers” was not associated with the outcome ($p > 0.05$). Adherence to dental treatment in primary care among young adults was associated with their general self-efficacy levels, socioeconomic characteristics, and individual’s lower HL aspects.

Keywords: Adolescent; Dental Care; Treatment Adherence and Compliance; Health Literacy; Self Efficacy.

Introduction

According to the United Nations, youth is a period of transition from childhood and dependence to adulthood and independence and, for statistical purposes, youths are defined as those people aged between 15 and 24 years.¹ In 2019, there were nearly 1.2 billion youths worldwide,^{1,2} whose health profiles differ greatly between and within countries.^{1,2} In Latin America and the Caribbean, the population of those aged 15 to 29 years was estimated at 110 million in 2015, and most of them were in Brazil, i.e., approximately 17 million.³ In this age



group, young persons (18 to 24 years)³ or young adults (18 to 25 years)⁴ are considered of special concern as they are key to the economic and social development of countries but present psychosocial challenges that tell them apart from adolescents and adults, such as the transition from school to career-oriented goals, which affects their health and should therefore be the subject of public policies.^{1,4} Thus, health systems must be able to identify personal and social difficulties of youths to the access and use of health services, thus allowing them to be treated with equity.^{3,4}

Overall health is intrinsically affected by oral health status⁵ which, in turn, is linked to well-being and quality of life.⁶ Studies have shown an increase in oral health problems from adolescence to adulthood, which increases the demand for dental treatment of this population.^{7,8} Even though Brazil offers public and universal health coverage to all its citizens, including dental treatment, and the level of primary care acts as a coordinating force in the integrated network of secondary and tertiary levels of care, the pattern of use of these public services among adolescents and young adults is complex and mediated by diverse socioeconomic, psychosocial, and individual factors.^{9,10}

Recent evidence has shown associations between health literacy (HL) and health outcomes, including access to and use of health services.¹¹ HL “entails people’s knowledge, motivation and competences to access, understand, appraise and apply health information in order to make judgments and take decisions in everyday life concerning health care, disease prevention and health promotion to maintain or improve quality of life during the life course.”¹¹ Therefore, HL is an important social determinant of health that impacts the capacity of young people to seek advice and care, as well as their ability to navigate the available health care system.^{11,12}

In dentistry, some studies have found associations between oral health literacy (OHL) and visits to the dentist, but the results are contradictory and mainly investigated in adult populations with a mean age over 30 years.^{13,14} It is unknown, however, whether HL, also known as general

health literacy, is associated with adherence to dental treatment among young adults, a population often neglected by health services and policies.^{1,3,4} This is an important issue, as multiprofessional interventions can be used to improve this outcome using HL if the associations between these variables are confirmed.

Another important factor associated with seeking dental care is self-efficacy, a construct related to one’s ability to carry out a particular action.^{15,16} Studies have demonstrated that levels of task-specific self-efficacy in dentistry are associated with better outcomes in oral health, including more frequent use of dental services.¹⁵ In addition, some studies have shown that self-efficacy mediates the relationship between HL and health status.^{16,17} However, to date, it is still unknown how these variables are related to non-adherence of young adults to dental treatment.

Despite the great importance of the health system in providing young people with access to oral health care, universal access to dental consultation does not guarantee treatment adherence.¹⁸ Therefore, the identification of factors that lead to non-adherence of this population is of great relevance for the implementation of measures that could improve treatment adherence.

The aim of this study was to investigate associations of HL, GSE, and sociodemographic variables with non-adherence to dental treatment among Brazilian young adults.

Methodology

Study design and setting

This is an analytical cross-sectional study nested within a cohort initiated in November 2012 with a sample of youths living in a medium-sized town in the state of São Paulo, Brazil. At that time, the town had 34 primary health care units (PHCUs), which provided public and universal health care, and among those units, there were 12 primary dental care units.¹⁹ The town had an estimated population of 365,000 inhabitants and a local human development index (HDI) of 0.84.¹⁹ In June 2015, a subsample was reexamined and referred for treatment of dental

caries (baseline). Within 18 months after baseline (February 2017), the researchers conducted the first follow-up evaluation. The second follow-up assessment occurred 18 months (August 2018) after the first one (Figure). Data were collected by two trained and calibrated examiners experienced in epidemiological surveys in order to obtain acceptable consistency in dental caries diagnosis.

Participants

A probabilistic sample of 1,179 youths aged 15 to 19 years was randomly selected in 2012 from 21

state schools and 34 PHCUs and examined for dental caries. Participants were examined for dental caries according to the decayed-missing-filled (DMFT) teeth index.²⁰ Youths treated at a PHCU were eligible for the study. Individuals with systemic diseases, communication difficulties, neuromotor problems, severe hypoplasia, or orthodontic braces were excluded from the study.¹⁹ Individuals absent on the day of the examination were excluded as well. Of that sample in 2015, 474 youths were reexamined and referred for dental caries treatment at a PHCU with oral health teams close to their homes or

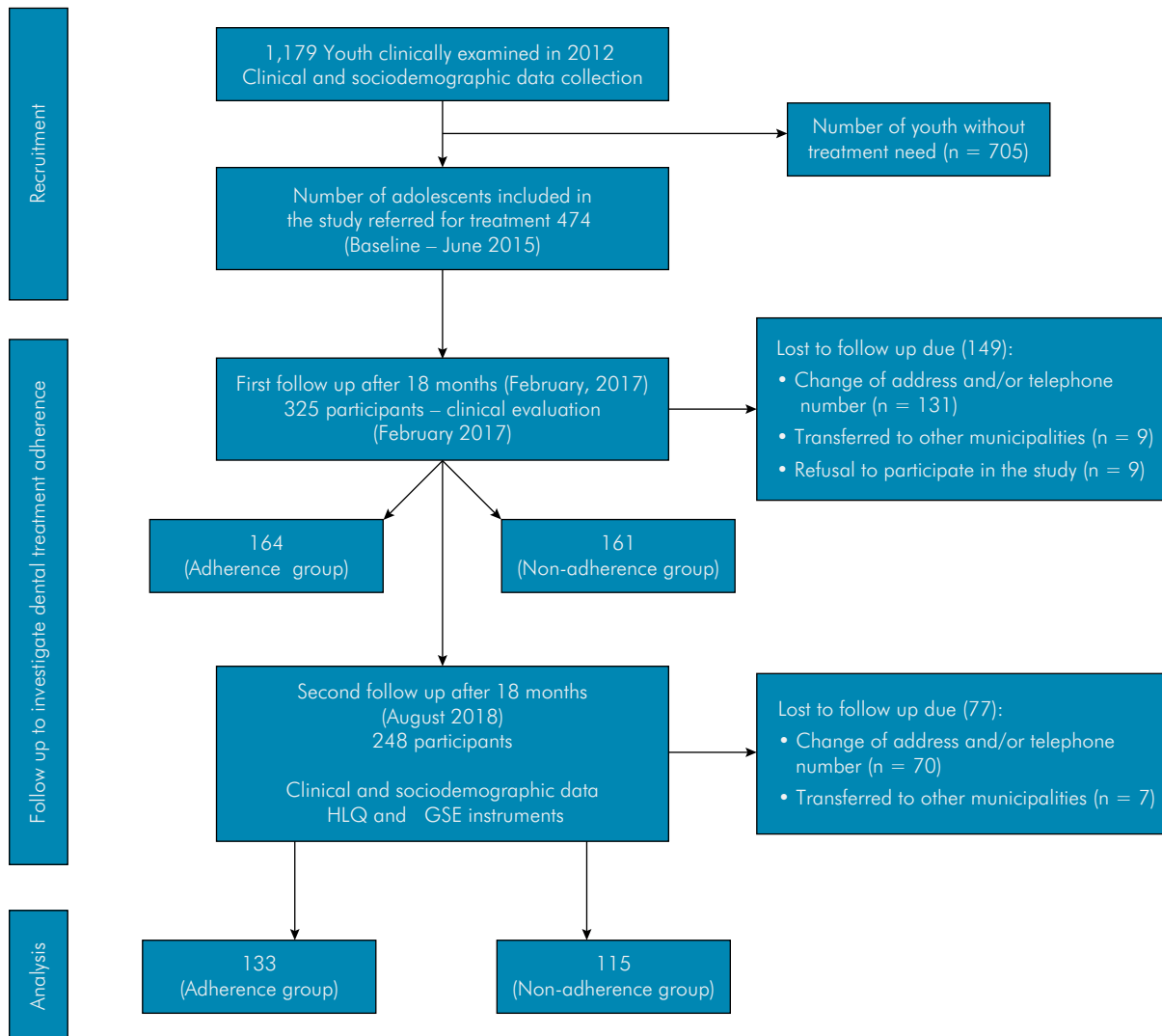


Figure. Flowchart of the study design.

at private clinics. The need for caries treatment, evaluated through the clinical presence of at least one decayed tooth, was used as inclusion criterion. This was considered the baseline of the study to compare the youths who sought dental treatment. After 18 months, the researchers conducted the first follow-up evaluation through an active search to locate those participants, and 325 were reassessed in their homes to investigate their adherence to dental treatment. The second follow-up assessment occurred 18 months after the first one and, in that moment, 248 participants were reexamined.

The examiners were trained and calibrated for dental caries evaluation. The calibration of examiners was performed in all phases of the study following the same criteria. The theoretical and practical training and calibration exercises consisted of a total of seven sessions, as follows: one theoretical session lasting four hours; four clinical training sessions of four hours each (a total of 16 h), and two calibration exercises lasting four hours (totaling 8 h). The training stage consisted of a theoretical discussion followed by a practical stage, during which the examiners evaluated 12 participants per period. The final calibration exercise consisted of two sessions (totaling 8 h) with a mean kappa coefficient of 0.95. In order to verify maintenance of the diagnostic criteria and measure the intra-examiner error, 10% of the sample was reexamined, showing a mean kappa coefficient of 0.96.

Variables

The outcome variable of the study was adherence to dental treatment, regarded as the decision of youths diagnosed with dental caries to seek dental treatment (Yes/No), evaluated through clinical examination.

In both the recruitment and follow-up phases, a questionnaire was applied to all participants for collection of demographic, socioeconomic, and oral health information, as previously described.¹⁹ The researchers remained in the youths' homes during data collection to answer any questions about the questionnaires.

In the second follow-up evaluation (August 2018), the participants also completed the Perceived General Self-Efficacy (GSE)²¹ Scale – the Brazilian version of the Health Literacy Questionnaire (HLQ)²² – and were reexamined for dental caries experience according to the DMFT index.

The GSE scale is an instrument for measuring general self-efficacy composed of a 10-item scale that can be self-administered. Each item is scored by the subject on a 4-point scale ranging from “not at all true” (1 point) to “exactly true” (4 points). The scores range from 10 to 40, with higher scores indicating higher self-efficacy.²¹

The Health literacy levels of participants were measured using the validated Brazilian version of the Health Literacy Questionnaire (HLQ-Br), a 44-item instrument that captures the concept of health literacy across nine distinct domains (measured using one scale per domain).²² The domains of the HLQ are: HQL-1: Feeling understood and supported by healthcare providers; HLQ-2: Having sufficient information to manage one's health; HLQ-3: Actively managing one's health; HLQ-4: Social support for health; HLQ-5: Appraisal of health information; HLQ-6: Ability to actively cooperate with healthcare providers; HLQ-7: Navigating the healthcare system; HLQ-8: Assessing the ability to find good health information; and HLQ-9: Understanding health information well enough to know what to do. Each of the nine domains contains between four and six items scored as a graded response. There are four response options for items in the first five domains: strongly disagree, disagree, agree, and strongly agree. Domains 6 to 9 have a range of five possible responses: cannot do, very difficult, quite difficult, easy, and very easy.^{22,23} The median of the score of each HLQ domain was calculated, in which values equal to or less than the median indicate low levels of HL, whereas values greater than the median indicate high levels of HL. The full HLQ provides nine individual scores based on an average of the items within each of the nine scales. There is no overall score for the HLQ as that could potentially mask individual needs in specific HL domains.²³

Study size

The sample size of 248 participants provided a power test ($1-\beta$) of 0.80, level of significance (α) of 0.05 for odds ratio greater than 2.0, and a percentage response of 37% for the non-exposed group.

The present study was approved by the Research Ethics Committee of UNICAMP (process no. 62567616.1.0000.5418) according to the Declaration of Helsinki.

Data analysis

Firstly, descriptive statistics were used to provide the proportions of respondents in the sample. Socioeconomic and demographic variables were dichotomized by the median of the sample, as well as by the GSE instrument score. The effects of HL domains on the adherence to dental treatment were analyzed using logistic regression and the effect was adjusted for sex, age, family income, paternal and maternal education, type of housing, and self-efficacy.

The variables with $p < 0.20$ in the unadjusted analyses were tested in the multiple logistic regression model. The unadjusted and adjusted odds ratio (OR) with the respective 95% confidence interval (CI) were estimated. The significance level was set at 5%.

In addition, to analyze differences between the total sample ($n = 248$) and those participants lost to follow-up ($n = 226$), descriptive analyses were performed with frequencies and percentages to compare the sociodemographic (sex, family income, paternal and maternal education) and clinical (DMFT index) variables using the chi-square test, at a level of significance of 5%.

The statistical analyses were performed using the SAS statistical software.

Results

Of the 1,179 youths aged 15 to 19 years, 474 were referred for dental caries treatment. Within 18 months after baseline, the researchers conducted the first follow-up assessment through an active search to locate the participants, and 325 were reassessed (non-response rate of 31.4%). Of the 325 participants of the study, 248 (76.3%) were

followed after 18 months (non-response rate of 23.7%), 133 (54.0%) adhered to the dental treatment, and 115 (46.0%) did not adhere to the treatment. No statistically significant differences were detected between the total sample and the sample lost to follow-up ($p > 0.05$).

Table 1 shows the description of sociodemographic variables, self-efficacy, and the Brazilian version of HLQ domains and the categories of individuals who adhered or did not adhere to the dental treatment.

More than 50% of the participants were aged ≤ 21 years (61.69%), were female (56.05%), had a family income of up to US\$ 378.5 (54.03%), and reported paternal and maternal education equal to or less than 6 years (66.94% and 62.10%, respectively). Regarding those participants who did not adhere to the dental treatment in the primary care setting, 63.64% reported living in a non-owner-occupied home and 61.29% presented lower self-efficacy. The sample of young adults presented better HL characteristics related to navigating the healthcare system, finding good health information, and understanding them in order to know what to do (HLQ domains 7 to 9). On the other hand, young adults attributed the lowest scores to HL characteristics related to "Feeling understood and supported by healthcare provider" (HLQ 1), "Having sufficient information to manage health" (HLQ 2), and "Being able to appraise health information" (HLQ5).

Table 2 presents the unadjusted and adjusted analyses of HL domains and self-efficacy, in addition to sociodemographic variables related to the adherence to dental treatment.

The results of the adjusted analysis showed associations between young adults who did not adhere to the dental treatment at PHCUs with lower self-efficacy levels, living in a non-owner-occupied home and lower of HL levels in the HLQ1 domain (OR = 2.35 CI = 1.34–4.14; OR = 2.54 CI = 1.38–4.68; OR = 3.30 CI = 1.83–5.92, respectively) in the HLQ2 domain (OR = 2.56 CI = 1.47–4.48; OR = 2.46 CI = 1.34–4.52; OR = 3.05 CI = 1.73–5.37, respectively), in the HLQ3 domain (OR = 2.50 CI = 1.43–4.37; OR = 2.29 CI = 1.26–4.17; OR = 2.83 CI = 1.59–5.01, respectively), in the HLQ4 domain (OR = 2.44 CI = 1.39–4.27; OR = 2.40 CI = 1.32–4.35;

Table 1. Description of sociodemographic variables, self-efficacy, and HLQ domains of the respondents who adhered or not to dental treatment in the second follow-up assessment in August 2018 (n = 248).

Variables	Adherence to dental treatment					
			Yes		No	
Categories	N	%	N	%	N	%
Sex						
Female	139	56.05	75	53.96	64	46.04
Male	109	43.95	58	53.21	51	46.79
Age						
≤ 21 years	153	61.69	79	51.63	74	48.37
> 21 years	95	38.31	54	56.84	41	43.16
Family income						
≤ US\$378.50 to US\$581.38	134	54.03	77	57.46	57	42.54
> US\$581.38	114	45.97	56	49.12	58	50.88
Paternal education						
≤ 6 years of schooling	164	66.94	88	53.66	76	46.34
> 6 years of schooling	81	33.06	44	54.32	37	45.68
Maternal education						
≤ 6 years of schooling	154	62.10	83	53.90	71	46.10
> 6 years of schooling	94	37.90	50	53.19	44	46.81
Type of housing						
Home ownership	171	68.95	105	61.40	66	38.60
Non-owner-occupied	77	31.05	28	36.36	49	63.64
Self-efficacy						
≤ 32	124	50.00	48	38.71	76	61.29
> 32	124	50.00	85	68.55	39	31.45
HLQ1 Feeling understood and supported by healthcare provider						
≤ 3	139	56.05	56	40.29	83	59.71
> 3	109	43.95	77	70.64	32	29.36
HLQ2 Having sufficient information to manage health						
≤ 3	128	51.61	51	39.84	77	60.16
> 3	120	48.39	82	68.33	38	31.67
HLQ3 Actively managing one's health						
≤ 3.2	137	55.24	56	40.88	81	59.12
> 3.2	111	44.76	77	69.37	34	30.63
HLQ4 Social support for health						
≤ 3.2	128	51.61	52	40.63	76	59.38
> 3.2	120	48.39	81	67.50	39	32.50
HLQ5 Appraisal of health information						
≤ 3	129	52.02	56	43.41	73	56.59
> 3	119	47.98	77	64.71	42	35.29

Continue

Continuation

HLQ6 Ability to actively cooperate with healthcare providers						
≤ 4	128	51.61	57	44.53	71	55.47
> 4	120	48.39	76	63.33	44	36.67
HLQ7 Navigating the healthcare system						
≤ 4.3	140	56.45	59	42.14	81	57.86
> 4.3	108	43.55	74	68.52	34	31.48
HLQ8 Ability to find good health information						
≤ 4.4	130	52.42	54	41.54	76	58.46
> 4.4	118	47.58	79	66.95	39	33.05
HLQ9 Understanding health information well enough to know what to do						
≤ 4.4	138	55.65	57	41.30	81	58.70
> 4.4	110	44.35	76	69.09	34	30.91

*HLQ: Health Literacy Questionnaire scale

OR = 2.66 CI = 1.50–4.71, respectively), in the HLQ5 (OR = 2.66 CI = 1.53–4.62; OR = 2.29 CI = 1.27–4.13; OR = 1.96 CI = 1.12–3.42, respectively), in the HLQ7 (OR = 2.42 CI = 1.38–4.25; OR = 2.49 CI = 1.37–4.54; OR = 2.49 CI = 1.40–4.42, respectively), in the HLQ8 (OR = 2.53 CI = 1.45–4.41; OR = 2.42 CI = 1.33–4.39; OR = 2.39 CI = 1.37–4.19, respectively), and in the HLQ9 (OR = 2.50 CI = 1.43–4.37; OR = 2.36 CI = 1.30–4.30; OR = 2.62 CI = 1.49–4.61, respectively). Only the HLQ6 domain “Ability to actively engage with healthcare providers” was not associated (OR = 1.67 CI = 0.96–2.91) with adherence to the dental treatment. The association among participants who did not adhere to the dental treatment was observed only with lower self-efficacy levels (OR = 2.69 CI = 1.54–4.70) and living in a non-owner-occupied home (OR = 2.37 CI = 1.31–4.26).

Discussion

The present study identified that Brazilian young adults with a worse socioeconomic status, lower levels of self-efficacy, and lower levels of diverse HL constructs were more prone to not adhere to the dental caries treatment at PHCUs next to their homes. To our knowledge, this is the first study to evaluate the association between HL aspects, using the multidimensional instrument, Health Literacy Questionnaire, and GSE, and adherence of young

adults to dental treatment, bringing new evidence for improving the healthcare of this population, which is still poorly investigated in the dental literature.

There were inequalities in oral healthcare utilization by young adults despite the availability to universal health coverage, which was associated with the type of housing, a key factor for individuals who live in poverty.²⁴ Owning one’s home is associated with better health status and less mental stress.²⁴ On the other hand, insecurity of tenure affects the continuity of health service provision and utilization,²⁵ and studies have shown that dental care was the most frequently postponed service by renters^{25,26} or less utilized by those individuals whose families owned their own homes.²⁷ These individuals who live in a home not owned by their own families tend to move away a lot when compared to those who live in family-owned homes. In addition, these individuals tend to lose the sense of belonging and establishing links with the primary health care because of constant moving, which leads to poorer use of health services and difficulty in accessing them.²⁵ Therefore, this factor should be considered by health services as an important determinant of healthcare utilization.

We observed that youths with high GSE levels had a greater chance of adhering to dental treatment. To our knowledge, this is the first study to investigate these associations for this age group.

Table 2. Unadjusted effects of health literacy domains and self-efficacy and sociodemographic variables on the adherence to dental treatment, and health literacy domain effects on adherence adjusted for self-efficacy and sociodemographic variables. Brazil, 2018.

HL Domain	Model variables	Unadjusted effect on adherence		Adjusted effect on adherence	
		OR (95%CI)	p-value	OR (95%CI)	p-value
HLQ1	HLQ domain effect (> 3)	3.57 (2.09–6.08)	<0.0001	3.30 (1.83–5.92)	<0.0001
	Sex (female)	1.03 (0.62–1.70)	0.9069		
	Age (> 21 years)	1.23 (0.74–2.07)	0.4242		
	Family income (≤US\$ 581.38)	0.72 (0.43–1.18)	0.1899	0.61 (0.35–1.07)	0.0832
	Paternal education (> complete elementary school)	1.03 (0.60–1.75)	0.9221		
	Maternal education (> complete elementary school)	0.97 (0.58–1.63)	0.9140		
	Type of housing (home ownership)	2.78 (1.60–4.86)	0.0003	2.54 (1.38–4.68)	0.0027
	Self-efficacy (>32)	3.45 (2.04–5.83)	<0.0001	2.35 (1.34–4.14)	0.0003
HLQ2	HLQ domain effect (> 3)	3.26 (1.93–5.49)	<0.0001	3.05 (1.73–5.37)	0.0001
	Sex (female)	1.03 (0.62–1.70)	0.9069		
	Age (> 21 years)	1.23 (0.74–2.07)	0.4242		
	Family income (≤US\$ 581.38)	0.72 (0.43–1.18)	0.1899	0.63 (0.36–1.10)	0.1042
	Paternal education (> complete elementary school)	1.03 (0.60–1.75)	0.9221		
	Maternal education (> complete elementary school)	0.97 (0.58–1.63)	0.9140		
	Type of housing (home ownership)	2.78 (1.60–4.86)	0.0003	2.46 (1.34–4.52)	0.0036
	Self-efficacy (>32)	3.45 (2.04–5.83)	<0.0001	2.56 (1.47–4.48)	0.0009
HLQ3	HLQ domain effect (> 3.2)	3.28 (1.93–5.55)	<0.0001	2.83 (1.59–5.01)	0.0004
	Sex (female)	1.03 (0.62–1.70)	0.9069		
	Age (> 21 years)	1.23 (0.74–2.07)	0.4242		
	Family income (≤US\$ 581.38)	0.72 (0.43–1.18)	0.1899	0.62 (0.36–1.09)	0.0944
	Paternal education (> complete elementary school)	1.03 (0.60–1.75)	0.9221		
	Maternal education (> complete elementary school)	0.97 (0.58–1.63)	0.9140		
	Type of housing (home ownership)	2.78 (1.60–4.86)	0.0003	2.29 (1.26–4.17)	0.0068
	Self-efficacy (>32)	3.45 (2.04–5.83)	<0.0001	2.50 (1.43–4.37)	0.0013
HLQ4	HLQ domain effect (> 3.2)	3.04 (1.81–5.11)	<0.0001	2.66 (1.50–4.71)	0.0008
	Sex (female)	1.03 (0.62–1.70)	0.9069		
	Age (> 21 years)	1.23 (0.74–2.07)	0.4242		
	Family income (≤US\$ 581.38)	0.72 (0.43–1.18)	0.1899	0.62 (0.36–1.09)	0.0959
	Paternal education (> complete elementary school)	1.03 (0.60–1.75)	0.9221		
	Mother education (> complete elementary school)	0.97 (0.58–1.63)	0.9140		
	Type of housing (home ownership)	2.78 (1.60–4.86)	0.0003	2.40 (1.32–4.35)	0.0042
	Self-efficacy (>32)	3.45 (2.04–5.83)	<0.0001	2.44 (1.39–4.27)	0.0019
HLQ5	HLQ domain effect (> 3)	2.39 (1.43–3.99)	0.0009	1.96 (1.12–3.42)	0.0180
	Sex (female)	1.03 (0.62–1.70)	0.9069		
	Age (> 21 years)	1.23 (0.74–2.07)	0.4242		
	Family income (≤US\$ 581.38)	0.72 (0.43–1.18)	0.1899	0.67 (0.39–1.15)	0.1442
	Paternal education (> complete elementary school)	1.03 (0.60–1.75)	0.9221		
	Maternal education (> complete elementary school)	0.97 (0.58–1.63)	0.9140		
	Type of housing (home ownership)	2.78 (1.60–4.86)	0.0003	2.29 (1.27–4.13)	0.0058
	Self-efficacy (>32)	3.45 (2.04–5.83)	<0.0001	2.66 (1.53–4.62)	0.0005

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Continuation

HLQ6	HLQ domain effect (> 4)	2.15 (1.29–3.58)	0.0032	1.67 (0.96–2.91)	0.0692
	Sex (female)	1.03 (0.62–1.70)	0.9069		
	Age (> 21 years)	1.23 (0.74–2.07)	0.4242		
	Family income (≤US\$ 581.38)	0.72 (0.43–1.18)	0.1899	0.73 (0.42–1.25)	0.2454
	Paternal education (> complete elementary school)	1.03 (0.60–1.75)	0.9221		
	Maternal education (> complete elementary school)	0.97 (0.58–1.63)	0.9140		
	Type of housing (home ownership)	2.78 (1.60–4.86)	0.0003	2.37 (1.31–4.26)	0.0041
	Self-efficacy (>32)	3.45 (2.04–5.83)	<0.0001	2.69 (1.54–4.70)	0.0005
HLQ7	HLQ domain effect (> 4.3)	2.99 (1.76–5.06)	<0.0001	2.49 (1.40–4.42)	0.0018
	Sex (female)	1.03 (0.62–1.70)	0.9069		
	Age (> 21 years)	1.23 (0.74–2.07)	0.4242		
	Family income (≤US\$ 581.38)	0.72 (0.43–1.18)	0.1899	0.69 (0.40–1.20)	0.1915
	Paternal education (> complete elementary school)	1.03 (0.60–1.75)	0.9221		
	Maternal education (> complete elementary school)	0.97 (0.58–1.63)	0.9140		
	Type of housing (home ownership)	2.78 (1.60–4.86)	0.0003	2.49 (1.37–4.54)	0.0028
	Self-efficacy (>32)	3.45 (2.04–5.83)	<0.0001	2.42 (1.38–4.25)	0.0021
HLQ8	HLQ domain effect (> 4.4)	2.85 (1.70–4.79)	<0.0001	2.39 (1.37–4.19)	0.0022
	Sex (female)	1.03 (0.62–1.70)	0.9069		
	Age (> 21 years)	1.23 (0.74–2.07)	0.4242		
	Family income (≤US\$ 581.38)	0.72 (0.43–1.18)	0.1899	0.69 (0.40–1.20)	0.1872
	Paternal education (> complete elementary school)	1.03 (0.60–1.75)	0.9221		
	Maternal education (> complete elementary school)	0.97 (0.58–1.63)	0.9140		
	Type of housing (home ownership)	2.78 (1.60–4.86)	0.0003	2.42 (1.33–4.39)	0.0038
	Self-efficacy (>32)	3.45 (2.04–5.83)	<0.0001	2.53 (1.45–4.41)	0.0011
HLQ9	HLQ domain effect (> 4.4)	3.18 (1.87–5.38)	<0.0001	2.62 (1.49–4.61)	0.0008
	Sex (female)	1.03 (0.62–1.70)	0.9069		
	Age (> 21 years)	1.23 (0.74–2.07)	0.4242		
	Family income (≤US\$ 581.38)	0.72 (0.43–1.18)	0.1899	0.69 (0.40–1.20)	0.1859
	Paternal education (> complete elementary school)	1.03 (0.60–1.75)	0.9221		
	Maternal education (> complete elementary school)	0.97 (0.58–1.63)	0.9140		
	Type of housing (home ownership)	2.78 (1.60–4.86)	0.0003	2.36 (1.30–4.30)	0.0049
	Self-efficacy (>32)	3.45 (2.04–5.83)	<0.0001	2.50 (1.43–4.37)	0.0013

Other authors, such as Lee et al.,²⁸ found that low GSE was associated with avoidance of dental care in a sample of American female adults with a mean age of 26.6 years (SD = 6.9), measured through the Dental Neglect Scale. In addition, the study of Jones et al.²⁹ demonstrated that non-attendance of indigenous Australians at South Australian public dental clinics was worse in those persons with a lower GSE. These findings highlight the need for

interventions aimed at increasing the self-efficacy of individuals for better oral self-care.

Several studies have found associations between low levels of HL and health outcomes, such as infrequent use of prevention services, limited capacity for self-management of chronic diseases, lower adherence to drug treatment, and higher mortality rate.¹¹ However, in the dental field, studies evaluating associations between HL and dental

outcomes are very scarce³⁰ and most authors prefer to use OHL instruments to evaluate associations between variables.¹³ Researchers who utilized HL instruments in the dental field generally applied instruments that measure only the functional aspects of HL, such as S-TOFHLA, TOFHLA, REALM, NVS, or some single screening questions,^{30,31} but very few investigated dental outcomes using a more comprehensive instrument.³²⁻³⁴

The group of young adults who did not adhere to the dental treatment had lower levels of general HL in eight scales of the HLQ-Br when compared to the non-adherence group. The domain with the highest OR was “Feeling understood and supported by healthcare providers” (adjusted OR = 3.30), followed by “Having sufficient information to manage one’s health” (adjusted OR = 3.05). It is known that the way by which healthcare professionals establish patient care, as well as their willingness to answer questions and explain the necessary care and procedures, have a great impact on patient adherence to treatment.³⁵ Therefore, healthcare providers need to identify patients who have difficulty understanding and using oral health information and should take steps to address their needs.

Although there are no studies in the literature with the same age group and outcome for comparisons, Cepova et al.³³ investigated associations of HL with oral health promotion behaviors in a sample of 360 Slovak adults (mean age of 39 years) visiting six private dental clinics. The authors found that those who visited a dentist for a preventive check-up or dental hygiene procedure presented higher scores in HLQ-Br domain 4 – social support for health. In addition, the authors found associations between higher scores in domain 1 of the HLQ and better oral hygiene habits, indicating that this HL domain was linked to greater responsibility towards behaviors that promote general and oral health. Therefore, our study corroborates the evidence that different HLQ domains are necessary to manage the different health outcomes; therefore, individuals will need specific HL skills to manage different situations.^{34,35}

Some hypotheses about the association between the HLQ domains and the outcome assessed in the present study can be raised. In relation to HLQ1 domains, it is known that patients show appreciation of dentists who respect them and listen to their concerns without blaming them for their oral problems.^{36,37} In addition, patients who had sufficient knowledge of their dental care were less likely to be irregular with their dental visits,²⁶ an aspect related to the HLQ2 domain. Moreover, a study demonstrated that HL levels were associated with better perceived oral self-efficacy for knowing how to prevent dental caries and periodontal diseases, a fact that could be associated with the HLQ3 domain.³⁵

Studies have shown that social support is an important aspect associated with utilization of dental services by adolescents,³⁷ which was reiterated in this study by the association with the HLQ-4 domain. Interestingly, the HLQ6 domain “Ability to actively engage with healthcare providers” was not associated with adherence to the dental treatment, a fact that contradicts the literature, which attests that better patient-dentist communication is associated with increased utilization of dental services.^{31,37} However, our findings were very close to the level of statistical significance adopted in this study, indicating that future studies with larger samples may change these findings.

The other HLQ domains related to appraisal of health information, as well as to the ability to find and understand them to achieve better health were also associated with the investigated outcome. Notwithstanding the evidence that worse knowledge of dental aspects is related to missed dental appointments or worse dental service utilization;³⁸⁻⁴⁰ to our knowledge, this is the first study to find associations between general health-related information and dental appointments. In addition, this is the first study to evaluate associations between young adults’ ability to navigate healthcare system (HLQ7) and oral health outcomes.

Taken together, the associations found between the HLQ domains and the assessed outcome indicate that dental treatment adherence of this population is a more complex phenomenon. The findings point to some possible ways to improve

adherence, such as improvement of interpersonal relationships between the health team and the youths; improvement and diversification of forms of communication between health systems and adolescents; improvement of adolescent autonomy for self-care; intersectoral actions for health and education to facilitate access and motivate the use of public dental services, thus creating a culture among youths that takes into account the importance of oral health and dental treatment.

This study has some limitations. Its cross-sectional design does not allow establishing any kind of causal relationship, which makes it difficult to state whether the associations presented precede or follow the occurrence of the outcome. The fact that the data were collected from a convenience sample limits the generalizability of the finding beyond the PHUC. In addition, we investigated just a few of the many variables associated with dental avoidance in this population. Finally, given that the HLQ instrument is extensive occasionally led some young adults to feel discouraged from responding it.

Despite such limitations, our findings bring important contributions to the scientific literature on HL because it addressed a population in a setting and an outcome not yet investigated in previous studies. The use of a general and multidimensional HL instrument proved to be appropriate to know the HL constructs related to dental treatment adherence

by young adults, and it can be used as an important tool by several health professionals, including dentists, who can provide comprehensive care for this population.

We emphasized the importance of further studies that seek to understand the phenomenon of adherence to dental treatment and HL among young adults, considering that this is an underdiscussed topic that is relevant for the development of health promotion strategies for this population.

Conclusion

Adherence to dental caries treatment among young adults was associated with their general self-efficacy levels, socioeconomic characteristics, and HL levels. Primary oral health care teams should pay attention to HL domains when planning actions to improve access and the motivation of youth to seek dental care, as it proved to be an important variable associated with this aspect in the present study. Future studies should be carried out with larger samples and in other contexts to corroborate or not the present findings.

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