

Self-perceived neighborhood factors and OHRQoL among adolescents: a population-based study in southern Brazil

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Abstract: This study aimed to assess the relationship between self-perceived neighborhood factors and oral health-related quality of life (OHRQoL) among adolescents from southern Brazil. A representative sample of 15-19-year-old students from Santa Maria, Brazil, was included. The Oral Health Impact Profile (OHIP-14) was used to assess the OHRQoL. Self-perceived neighborhood factors were assessed through a structured questionnaire and included characteristics of the neighborhood where the adolescents lived, such as the presence of paved streets, tap water, community social networks, and availability of dental services and the Family Health Strategy (FHS). In addition, socioeconomic, behavioral, and clinical variables (dental caries and malocclusion) were also evaluated. Multilevel Poisson regression analysis with a hierarchical approach was used to assess the association between predictors and OHIP-14. The rate ratio (RR) and 95% confidence intervals (CIs) were estimated. A total of 1,197 adolescents were included in this study (participation rate: 72.3%). The mean OHIP-14 score was 8.4 (standard error = 0.2), ranging from 0 to 49. Living in residences with unpaved streets (RR = 1.11, 95%CI:1.06–1.17), no tap water (RR = 1.11, 95%CI: 1.02–1.20), absence of the FHS services (RR = 1.15, 95%CI: 1.09–1.20), and the availability of dental services (RR = 1.08, 95%CI: 1.03–1.14) were associated with higher OHIP-14 scores, indicating a poorer OHRQoL. In addition, lower socioeconomic status, visiting the dentist for curative reasons, lower frequency of brushing teeth, and higher sugar consumption were also associated with higher OHIP-14 scores. In conclusion, self-perceived neighborhood characteristics were associated with OHRQoL in adolescents. Adolescents who perceived their neighborhood as deprived had poorer OHRQoL.

Keywords: Adolescent; Dental Caries; Quality of Life; Residence Characteristics.

Introduction

Epidemiological studies on oral pathologies have surpassed the scrutiny of clinical signs. Repercussions of oral diseases not only impact

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physical well-being but extend to emotional, mental, economic, and social contexts.¹ Apart from biological and behavioral factors, prevalence, severity, and progression rates of diseases are also influenced by social determinants^{2,3} that shape and maintain social hierarchies through social and political mechanisms.⁴

The assessment of the impact of oral diseases has been focused on distal factors and subjective measures of oral health,^{1,5} such as the oral health-related quality of life (OHRQoL). The literature has shown an inverse association between oral disease prevalence and OHRQoL.^{6,7} It is clear that socioeconomic status influences this relationship and low educational levels, low family incomes, and poor access to health services increase the negative impact of oral conditions on the quality of life.⁸ Considering that living and working conditions of individuals are related to health outcomes,² previous studies have investigated the association between variables at the neighborhood level and OHRQoL in different populations. However, most studies on adolescents have focused on variables at school-level^{9,10} or restricted to the neighborhood's socioeconomic status and social support.^{11,12} Very few studies have included other neighborhood variables and their impact on adolescents. In addition, most studies addressing the association between neighborhood factors and oral health outcomes use contextual data derived from official sources,⁹⁻¹² and little is known about the adolescents' self-perception of these factors.

OHRQoL represents a dynamic construct that may change over time.^{13,14} The transition from adolescence to adulthood is an important period in which quality of life may be affected. During this period, individuals become responsible for their self-care and are subject to their choices.¹⁵ Thus, socio-environmental factors can affect health-related behaviors. The result of this interaction can influence clinical and behavioral measures that persist throughout the life of an individual.¹⁶ Considering the need for further evidence on this issue, this study investigated the relationship between self-perceived neighborhood factors and OHRQoL among adolescents from southern Brazil. We hypothesized that adolescents who perceived that they were from a poorer neighborhood had poorer OHRQoL.

Methodology

A population-based cross-sectional study assessed the oral health status of 15-19-year-old students from Santa Maria, a mid-sized city in southern Brazil. The study protocol was approved by the Research Ethics Committee of the Federal University of Santa Maria (CAAE 69901917.5.0000.5346). In addition, written informed consent was obtained from all the participants or their parents or legal guardians. This study followed the STROBE statement.¹⁷

Sample

Students born between 1999 and 2003 attending any school period (morning, afternoon, or night) from all 37 public and private urban high schools (26 public and 11 private) in Santa Maria were considered eligible for the study. A simple random sampling strategy was used, considering the enrolled students as the survey unit. Participants were randomly selected in proportion to the school size using a table of random numbers. Students using fixed orthodontic appliances or those with special needs were not considered eligible.

The sample size was calculated using the following parameters: prevalence of 50% (worst-case scenario), 95% confidence interval (CI), power of 80%, and precision level of 3%. It was estimated that 1,066 students would be required, to which a non-participation rate of 50% was added, totaling 1,600 adolescents to be invited to participate. This sample is far more than required to estimate a difference between Oral Health Impact Profile-14 (OHIP-14) means of 11.9 (standard deviation [SD] = 11.8) in the exposed group (poor social context) and 8.4 (SD = 7.0) in the unexposed group (better social context), as previously described.¹⁸

Data collection

Data were collected from March to November of 2018. First, a questionnaire on self-perceived neighborhood factors and socioeconomic and demographic characteristics was completed by adolescents.

Self-perceived neighborhood factors included characteristics of the neighborhood where the adolescents lived and were chosen based on a theoretical framework and previous literature on this topic.^{2,3,11,12,19} The characteristics of the neighborhood

included the absence or presence of the following: paved streets (cobblestone, asphalt, or concrete roads), tap water (treated and supplied by the sanitation company), community centers, religious centers, availability of dental services, existence of the Family Health Strategy (FHS) services, and an area designated for physical activities. The FHS is a government program that focuses on primary healthcare. It is composed of a multi-professional team, which aims to improve the quality of life by following families more closely and intervening in the risk factors for diseases. Residences/neighborhoods covered by FHS receive home visits by health professionals regularly.

Socioeconomic variables included were as follows: maternal education (\leq elementary school, high school, or university); family income, measured through the Brazilian minimum wage (1 BMW corresponded to approximately USD 250 during the period of data collection) and dichotomized as \leq 2 BMW or $>$ 2 BMW; and household crowding, categorized as low (\leq 1 person/room), medium ($>$ 1 and \leq 2 persons/room), or high ($>$ 2 persons/room). Demographic variables included sex (boys or girls), age (\leq 16 years or \geq 17 years), and skin color (white or non-white).

Another questionnaire was administered to the adolescents to gather data on behavioral variables and OHRQoL. Behavioral variables included the reason for the last visit to the dentist (control/prevention/others or pain/restoration/extraction), frequency of brushing teeth (\leq once a day, twice a day, or \geq 3 times a day), and consumption of sugar-sweetened drinks (\leq twice a day, 3–4 times a day, 5–6 times a day, or \geq 7 times a day). The OHIP-14 was used to evaluate OHRQoL.^{20,21} It is a valid, reliable, and widely used instrument to assess the impact of oral conditions on OHRQoL. It includes seven subscales related to functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap.^{20,21}

Clinical examinations were conducted at schools using air compressor, artificial light, clinical mirrors, and periodontal probes (ballpoint/WHO). The adolescents were placed in a supine position over the school desks. After tooth cleaning and drying, the adolescents were examined by two trained and calibrated examiners for dental caries (DMFT)²² and malocclusion (DAI).²²

Examiners' reliability was assessed before the beginning of the study and over the data collection period by reexamining 5% of the sample. The minimum kappa value for DMFT and the minimum intraclass correlation coefficient for DAI were both 0.80.

Data analysis

Data analysis was performed using STATA software (Stata 14.2, Stata Corporation, College Station, USA). A weight variable based on the probability of selection and population distribution was used in the statistical analysis according to sex and school type. The weight variable was placed using the "svy" command for complex data samples.

The outcome of this study was OHRQoL, modeled as a count variable (OHIP-14 score). Preliminary analysis comparing the mean OHIP-14 scores among categories of predictors was carried out using the Wald test. Multilevel Poisson regression analysis was used to assess the association between predictors and OHIP-14 scores, considering adolescents as the first-level unit and neighborhoods (collected from the adolescents' addresses) as the second-level unit. The multilevel model used the scheme of fixed effects with a random intercept. In addition, a multilevel hierarchical analysis was performed based on a contextual framework (Figure 1) adapted from the WHO.²³ Four models were described: Model 1 ("empty model") was an unconditional model; Model 2 included self-perceived neighborhood variables related to neighborhood characteristics; Model 3 was composed of Model 2 plus individual socioeconomic and demographic characteristics; and Model 4 was composed of Model 3 plus behavioral and clinical variables. All variables with $p < 0.20$ in the unadjusted analysis were included in the adjusted analysis. In all models, the deviance ($-2\log$ likelihood) was measured to assess the quality of fit. The results are presented as rate ratios (RRs) and 95% CIs.

Results

A total of 1,197 15–19-year-old individuals were included in the study (participation rate 72.3%). The main reason for non-participation was a lack of signed consent. As six schools refused to take

part in the study (two private and four public), the number of students to be selected in each school was proportionally adjusted in the 31 participating schools to reach the necessary sample size. A flowchart of this study is shown in Figure 2.

Table 1 presents the characterization of the sample, the mean OHIP-14 scores by predictors, and the unadjusted multilevel Poisson regression analysis.

Overall, the mean OHIP-14 score was 8.2 (standard error = 0.2), ranging from 0 to 49. No significant difference was detected in the self-perceived neighborhood variables. Notwithstanding, all of them were significantly associated with OHIP-14 scores in the unadjusted analysis, except for the availability of dental services and the presence of an area for physical activities.

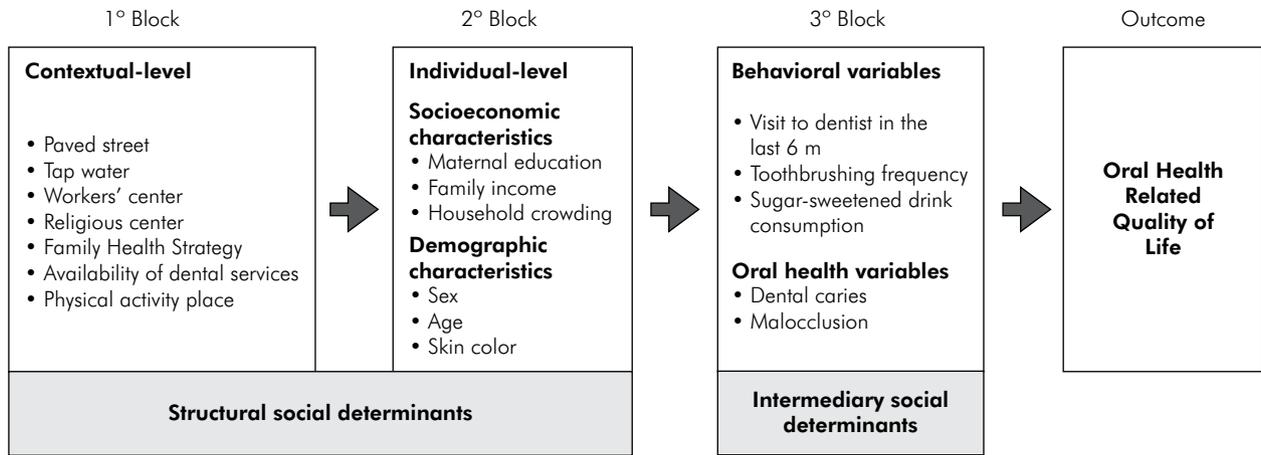


Figure 1. Theoretical model for the study of determinants of OHRQoL in adolescents, adapted from World Health Organization.²³

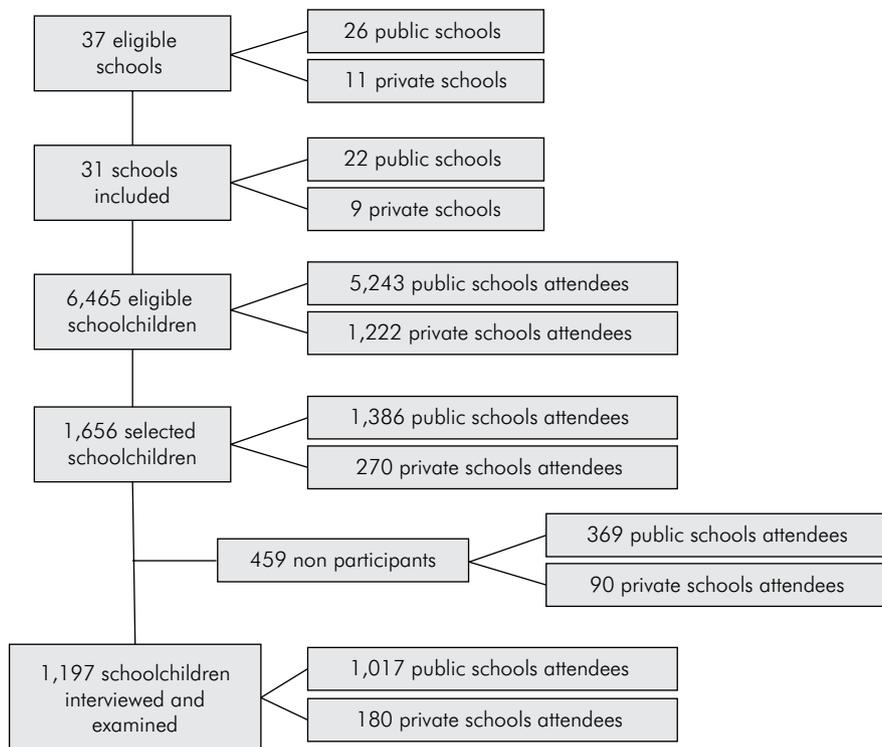


Figure 2. Flowchart of the study.

Table 1. Characteristics of sample, mean OHIP-14 scores, and the unadjusted association between explanatory variables and OHIP-14 scores (n = 1,197).

Variable	n (%)	Mean (SE)	RR (95%CI)*	p-value
Contextual-level variables (Neighborhood)				
Paved street [†]				
Yes	704 (60.7)	7.8 (0.3) ^a	1.00	
No	456 (39.3)	8.7 (0.4) ^a	1.11 (1.06–1.16)	< 0.001
Tap water [†]				
Yes	1,074 (91.9)	8.2 (0.3) ^a	1.00	
No	95 (8.1)	8.3 (0.8) ^a	1.10 (1.02–1.20)	0.01
Community center [†]				
Yes	338 (28.8)	8.0 (0.4) ^a	1.00	
No	836 (71.2)	8.3 (0.3) ^a	1.05 (1.00–1.11)	0.03
Religious Center [†]				
Yes	1,038 (88.4)	8.1 (0.2) ^a	1.00	
No	136 (11.6)	8.7 (0.8) ^a	1.09 (1.02–1.16)	0.01
Family Health Strategy [†]				
Yes	483 (41.1)	7.9 (0.3) ^a	1.00	
No	691 (58.9)	8.5 (0.3) ^a	1.13 (1.08–1.18)	< 0.001
Availability of dental services [†]				
No	693 (59.0)	8.2 (0.3) ^a	1.00	
Yes	481 (41.0)	8.3 (0.5) ^a	1.04 (0.99–1.08)	0.09
Physical activity place [†]				
Yes	687 (58.5)	8.1 (0.3) ^a	1.00	
No	487 (41.5)	8.3 (0.4) ^a	1.03 (0.99–1.08)	0.10
Individual-level variables (Adolescent)				
Socioeconomic variables				
Maternal education [†]				
University	192 (16.7)	6.5 (0.5) ^a	1.00	
High school	380 (33.1)	8.2 (0.4) ^b	1.25 (1.17–1.34)	< 0.001
≤ Primary school	577 (50.2)	8.7 (0.3) ^b	1.27 (1.18–1.35)	< 0.001
Family income [†]				
> 2 BMW	509 (45.8)	7.0 (0.3) ^a	1.00	
≤ 2 BMW	602 (54.2)	9.4 (0.3) ^b	1.30 (1.24–1.35)	< 0.001
Household crowding [†]				
Low	275 (23.9)	7.3 (0.4) ^a	1.00	
Medium	751 (65.3)	8.1 (0.3) ^a	1.09 (1.03–1.15)	< 0.001
High	124 (10.8)	11.8 (1.0) ^b	1.51 (1.40–1.62)	< 0.001
Demographic variables				
Sex				
Boys	513 (42.9)	7.4 (0.4) ^a	1.00	
Girls	684 (57.1)	9.0 (0.3) ^b	1.20 (1.15–1.25)	< 0.001
Age (years)				
≤ 16	655 (54.6)	7.6 (0.3) ^a	1.00	
≥ 17	544 (45.4)	9.1 (0.4) ^b	1.19 (1.15–1.24)	< 0.001
Skin color [†]				
White	779 (67.0)	7.9 (0.3) ^a	1.00	
Non-white	384 (33.0)	9.0 (0.4) ^b	1.12 (1.08–1.17)	< 0.001

Continue

Continuation

Variable	n (%)	Mean (SE)	RR (95%CI)*	p-value
Behavioral variables				
Reason of the last visit to the dentist				
Control/prevention/others	809 (72.8)	6.9 (0.2) ^a	1.00	
Pain/restoration/extraction	302 (27.2)	12.0 (0.5) ^b	1.75 (1.67–1.83)	< 0.001
Tooth brushing frequency [†]				
≥ 3 times a day	566 (47.4)	8.0 (0.3) ^a	1.00	
Twice a day	512 (42.9)	8.0 (0.3) ^a	0.98 (0.94–1.02)	0.34
≤ once a day	116 (9.7)	10.2 (0.8) ^b	1.24 (1.16–1.32)	< 0.001
Sugar-sweetened drink consumption [†]				
≤ twice a day	664 (55.6)	7.4 (0.3) ^a	1.00	
3–4 times a day	380 (31.8)	8.5 (0.4) ^b	1.13 (1.08–1.18)	< 0.001
5–6 times a day	100 (8.4)	10.7 (0.7) ^{bc}	1.37 (1.28–1.46)	< 0.001
≥ 7 times a day	51 (4.3)	12.2 (2.1) ^b	1.62 (1.48–1.76)	< 0.001
Oral health variables				
Dental caries				
DMFT = 0	641 (53.6)	6.8 (0.3) ^a	1.00	
DMFT ≥ 1	556 (46.4)	9.9 (0.4) ^b	1.47 (1.42–1.54)	< 0.001
Malocclusion				
DAI ≤ 25	293 (24.5)	7.0 (0.2) ^a	1.00	
DAI > 25	904 (75.5)	8.7 (0.3) ^b	1.26 (1.20–1.32)	< 0.001
TOTAL	1,197 (100.0)	8.4 (0.2)		

SE: Standard error; CI: Confidence interval; RR: rate ratio; BMW: Brazilian minimum wage (1 BMW corresponded to approximately USD 250 during the period of data collection); DMFT: decayed, missing, and filled teeth index; DAI: Dental aesthetic index. † Missing data.

*Multilevel Poisson regression analysis. Different letters indicate statistically significant difference between categories (Wald test, $p < 0.05$).

The adjusted multilevel Poisson models using a hierarchical approach are presented in Table 2. As shown in Model 2, living in residences with unpaved streets (RR = 1.11; 95%CI: 1.06–1.17), no tap water (RR = 1.11; 95%CI: 1.02–1.20), absence of the FHS (RR = 1.15; 95%CI: 1.09–1.20), and availability of dental services (RR = 1.08; 95%CI: 1.03–1.14) were associated with higher OHIP-14 scores. Model 3 shows that indicators of low socioeconomic status and demographic variables (girls, older, and non-white) were associated with poorer OHRQoL. In addition, as shown in Model 4, adolescents reporting a lower frequency of brushing teeth, higher frequency of consumption of sugar-sweetened drinks, and those with dental caries and malocclusion reported higher OHIP-14 scores.

Discussion

This population-based study was conducted to assess the effects of self-perceived neighborhood

variables on the OHRQoL of 15–19-year-old South Brazilian adolescents. Our main result was that living in neighborhoods with a low urban framework, lesser access to public health policies, and availability of dental services were associated with poorer OHRQoL. Moreover, sociodemographic, behavioral, and clinical factors were also associated with poorer OHRQoL.

Adolescents living in residences with unpaved streets and no tap water had a poorer OHRQoL than their counterparts. The urban environment, providing basic housing resources to the population, plays a fundamental role in building community well-being.²⁴ Access to education, health care facilities, jobs, and a safe environment are strong determinants of community health.²⁵ The lack of paved streets and tap water is related to poor conditions of sanitation, security, accessibility, and unhealthy environment, which are hallmarks that describe social inequality.²⁶ Furthermore, the lack of tap water deprives adolescents of fluoridated water, which is a determinant of the

Table 2. Adjusted association between explanatory variables and OHIP-14 scores. Multilevel Poisson regression analysis.

Variable	Model 1 ^a	Model 2 ^b	Model 3 ^c	Model 4 ^d
	RR (95%CI)	RR (95%CI)	RR (95%CI)	RR (95%CI)
Fixed component				
Intercept	8.28 (7.73–8.87)*	6.62 (6.02–7.27)*	4.07 (3.61–4.57)*	2.88 (2.46–3.38)*
Contextual-level variables (Neighborhood)				
Paved street (ref. Yes)				
No		1.11 (1.06–1.17)*	1.06 (1.00–1.11)	1.01 (0.96–1.07)
Tap water (ref. Yes)				
No		1.11 (1.02–1.20)*	1.09 (0.99–1.19)	1.16 (1.05–1.27)
Community center (ref. Yes)				
No		1.03 (0.98–1.09)	1.04 (0.99–1.10)	1.02 (0.97–1.08)
Religious Center (ref. Yes)				
No		1.07 (1.00–1.14)	1.1 (1.03–1.19)	1.07 (0.99–1.15)
Family Health Strategy (ref. Yes)				
No		1.15 (1.09–1.20)*	1.17 (1.11–1.22)	1.18 (1.12–1.24)
Availability of dental services (ref. No)				
Yes		1.08 (1.03–1.14)*	1.05 (1.00–1.11)	1.06 (1.01–1.12)
Physical activity place (ref. Yes)				
No		1.02 (0.97–1.07)	0.97 (0.92–1.02)	1.02 (0.96–1.08)
Individual-level variables (Adolescent)				
Socioeconomic variables				
Maternal education (ref. University)				
High school			1.13 (1.05–1.21)*	1.07 (0.99–1.15)
≤ Primary school			1.10 (1.02–1.19)*	1.04 (0.96–1.12)
Family income (ref. > 2 BMW)				
≤ 2 BMW			1.26 (1.21–1.33)*	1.18 (1.12–1.24)
Household crowding (ref. Low)				
Medium			1.12 (1.06–1.18)*	1.11 (1.05–1.18)
High			1.44 (1.33–1.56)*	1.41 (1.30–1.53)
Demographic variables				
Sex (ref. Boys)				
Girls			1.20 (1.15–1.26)*	1.24 (1.17–1.30)
Age (ref. ≤ 16 years)				
≥ 17			1.16 (1.11–1.22)*	1.10 (1.05–1.15)
Skin color (ref. White)				
Non-white			1.06 (1.01–1.12)*	1.07 (1.02–1.13)
Behavioral variables				
Reason of the last visit to the dentist (ref. Control/prevention/others)				
Pain/restoration/extraction				1.53 (1.45–1.61)*
Tooth brushing frequency (ref. ≥ 3 times a day)				
Twice a day				0.94 (0.89–0.98)*
≤ once a day				1.26 (1.16–1.36)*
Sugar-sweetened drink consumption (ref. ≤ twice a day)				
3–4 times a day				1.09 (1.03–1.15)*
5–6 times a day				1.31 (1.21–1.42)*
≥ 7 times a day				1.43 (1.29–1.58)*

Continue

Continuation

Variable	Model 1 ^a	Model 2 ^b	Model 3 ^c	Model 4 ^d
	RR (95%CI)	RR (95%CI)	RR (95%CI)	RR (95%CI)
Oral health variables				
Dental caries (ref. DMFT=0)				
DMFT ≥ 1				1.25 (1.19–1.31)*
Malocclusion (ref. DAI≤25)				
DAI > 25				1.19 (1.12–1.26)*
Random component				
Deviance (-2 loglik)	11560.09	11097.42	9351.64	7930.92

^aModel 1: empty model, unconditional model; ^bModel 2: model 1 adjusted for contextual variables; ^cModel 3: model 2 adjusted for contextual, demographic, and socioeconomic variables; ^dModel 4: fully adjusted for contextual, demographic, socioeconomic, behavioral, and oral health variables. RR: rate ratio; CI: confidence interval; BMW: Brazilian minimum wage (1 BMW corresponded to approximately USD 250 during the period of data collection); *p-value < 0.05.

caries decline observed at the population level.²⁷ Thus, oral diseases mainly affect disadvantaged and socially marginalized populations and, consequently, their OHRQoL. This finding is aligned with those of the previous studies.^{9,14,28,29} A 2-year Brazilian cohort study indicated that a lower mean income of the school's neighborhood, household income, and maternal schooling affected OHRQoL over time.¹² Residents of neighborhoods with lower socioeconomic status faced a higher risk of premature mortality, which further provides evidence of the impact of neighborhood contextual factors on health outcomes, even in developed countries.³⁰ Thus, places of residence seem to be a strong predictor of OHRQoL.³¹ In this context, planning and performing oral health promotion strategies should consider the influence of the neighborhood environment on individual responses to oral disease and their coping methods.¹⁴

Adolescents who perceived the absence of FHS in their neighborhood were 15% more likely to report a poorer OHRQoL than those who reported the presence of this service. The promotion of home visits by health professionals is one of the key actions of the FHS, and we can presume that easy access to information on both general and oral health care may explain our findings of a better OHRQoL. In contrast, adolescents living in neighborhoods without FHS services are not given enough information about healthy habits and behaviors. In addition, health professionals from FHS follow families closely and intervene when potential risk factors for diseases are detected. Hence, the presence of FHS services may

also positively affect OHRQoL, because it allows early detection of diseases and referral to dental services thereby, decreasing the treatment costs and disease extension.³² It should be highlighted that not all FHS services have a dental professional in the team. However, the presence of the service itself may have a positive effect on oral health and OHRQoL, since general recommendations on breastfeeding, healthy dietary habits, and general hygiene may affect the behaviors and practices of the family and ultimately benefit oral health.

Adolescents who lived in neighborhoods with the availability of dental services presented higher OHIP-14 scores than those who reported the absence of dental services. This can be explained by the "Inverse Care Law", according to which both the amount of care available and the quality of care provided are inversely related to the need.³³ Individuals with greater needs are often unable to access services, further affecting their OHRQoL. The notion that the availability of a health care service in the neighborhood could be translated into a) access, b) services of quality, and c) better OHRQoL proved to be a misconception in this population. In addition, it is possible to speculate that the profile of the dental service available in the neighborhood may influence its association with OHRQoL, whether preventive, operative, aimed at emergency care, focused on primary level care, or specialized treatment, among others.

Social networks formed at religious and community centers play an important role in influencing the social support system and oral health of a community.

However, these self-perceived neighborhood variables were not associated with OHRQoL among South Brazilian adolescents. The lack of community and religious centers in the neighborhood negatively affected the OHRQoL of adolescents in the unadjusted analysis; however, after adjusting for other factors, these associations lost the statistical significance. This finding could be related to the age of the population in this study. During adolescence and young adulthood, individuals continue to build interpersonal relationships, and social networks may be more easily built between family members, friends, and schoolmates³⁴ rather than at community and religious centers.

This study is important because we have evaluated the several factors that can influence OHRQoL, such as self-perceived neighborhood characteristics, sociodemographic, behavioral, and clinical factors. Considering that an individual's perception of a service/association/structural factor in a neighborhood may not always match the official sources, this information was individually collected by a questionnaire. Therefore, we presumed that the self-perception of each adolescent would be more meaningful for the study than the neighborhood data collected from official sources. All urban, public, and private schools were invited to participate in the study, and the vast majority agreed to participate (31 out of 37). Although six schools did not agree to participate, they were distributed proportionally according to school type and spread evenly throughout the city regions, thus ensuring the external validity of the data. In addition, the random allocation procedure comprised all schoolers in the morning, afternoon, and night school periods. Therefore, we consider our sample representative of the population. Furthermore, methodological issues such as examiners' reproducibility and the use of a validated questionnaire to measure OHRQoL provided

a high internal validity to our study. Among the study limitations resides the fact that some questions of the neighborhood self-perception questionnaire may have been answered by adolescents' parents/legal guardians, thus adding some degree of bias to the data. The exclusion of adolescents with fixed orthodontic appliances can also be a possible limitation of this study. Even considering their increased risk for caries development,³⁵ we decided to exclude these individuals due to the additional difficulties imposed by the fixed apparatus to perform proper clinical examinations under field conditions. Moreover, we could assume some degree of ecological fallacy in data interpretation, considering that inferences about individuals were deduced from data about the neighborhood to which they belong. Finally, this study had a cross-sectional design and causal relationships could not be addressed.

In conclusion, this population-based cross-sectional study showed that self-perceived neighborhood characteristics were associated with OHRQoL in 15-19-year-old adolescents. Individuals who perceived their neighborhood as deprived had poorer OHRQoL. In addition, the availability of dental services was also associated with higher OHIP-14 scores. These findings are useful for implementing public health policies targeting structural factors, which can partly explain the reasons for inequalities in oral health and quality of life in this population.

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