

## Oral health of quilombola and non-quilombola rural adolescents: a study of hygiene habits and associated factors

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**Abstract** *This study evaluated oral hygiene habits and their association with sociocultural, environmental factors and factors related to the use of dental services among Quilombola and non-Quilombola rural adolescents from inland Bahia. This was a cross-sectional study conducted in 2015. Prevalence and prevalence ratios were estimated for the outcomes and multiple Poisson regression analysis with robust variance was performed. We interviewed 390 adolescents, of which 42.8% were Quilombola. Poor tooth brushing and non-flossing were found in 33.3% and 46.7% of adolescents, respectively. Poor tooth brushing was increased by male gender (PR = 1.45), not living with both parents (PR = 1.45), lower hand hygiene habit (PR = 1.72) and worse oral health self-assessment (PR = 1.38). Non-flossing was associated with economic level E (PR = 1.54), older age (PR = 0.91), lower hand hygiene habit (PR = 1.53) and worse oral health self-assessment (PR = 1.33). Different associated factors were observed between Quilombola and non-Quilombola. It is necessary to consider the specificities of the populations for the promotion of adolescent oral health and the importance of the intersectoriality between education and health and care to families.*

**Key words** *Oral health, Adolescent, Rural health, Ethnicity and health*

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## Introduction

Adolescence, the stage of life between childhood and adulthood, is a period in which differentiated attention is required regarding general and oral health<sup>1</sup>. Physiological, psychological and social changes, typical of this stage make this population group more vulnerable to health risk situations<sup>2</sup>.

Oral health is a relevant aspect of adolescent life. An adverse perception of oral health influences the self-esteem and socialization of this group<sup>3,4</sup>. Among the oral problems that may interfere with adolescents' quality of life are untreated tooth decay, severe occlusion, tooth pain and loss, and gum bleeding<sup>5,6</sup>.

One of the ways of preventing diseases and oral problems is proper oral hygiene, where tooth brushing and flossing are essential tools<sup>1</sup>. Brazilian studies show that the prevalence of tooth brushing ( $\geq 3$  times/day) ranges from 49.8% to 77.0% among adolescents. However, flossing is still not a consolidated habit when compared to brushing, with frequencies varying from 0.5% to 51.0%<sup>7,8</sup>.

Oral hygiene habits are influenced by different factors related to individuals and their families. A higher prevalence of poor practices is noted in male adolescents, with lower economic level/maternal level of schooling and who report feeling alone<sup>7,9,10</sup>. International studies have revealed that low prevalence of tooth brushing and flossing are associated with dwelling in rural areas<sup>11,12</sup>. In Brazil, a study on rural children and adolescents aged 6-12 years showed tooth brushing ( $\geq 3$  times/day) of 56.4% and flossing of 26.4% of respondents<sup>13</sup>.

The place of residence is a realm establishing the oral health situation of social groups. Individuals with similar social profiles may evidence different oral health levels, depending on the location and attributes of the dwelling place<sup>14</sup>.

Quilombola adolescents mostly reside in rural communities with specific territorial relationships related to resistance to the historical oppression suffered by this population<sup>15,16</sup>. They coexist with social vulnerabilities related to their places of residence, such as lower coverage of water supply through a general distribution network and regular collection of garbage, low schooling and household income, when compared with other rural communities<sup>17</sup>, as well as difficult access to the dental services<sup>18</sup>.

Thus, this study aimed to evaluate oral hygiene habits and its association with sociocultur-

al and environmental factors, as well as factors related to the use of dental services among rural Quilombola and non-Quilombola adolescents from a rural area in inland Bahia.

## Methods

This is a cross-sectional, population-based and home-based study conducted with adolescents aged 10-19 years of age, living in 21 Quilombola rural communities recognized by the Palmares Cultural Foundation (FCP)<sup>15</sup> and non-Quilombola communities from Vitória da Conquista, Bahia. This study is part of the study *Adolescer: Adolescent Health of the Rural Area and its Conditions*, approved by the Human Research Ethics Committee of the Multidisciplinary Health Institute, the Federal University of Bahia.

The sampling strategy considered the territorial extension and the population of adolescents living in rural communities, to ensure the representativeness and feasibility of the research. The following sampling principles were used: to select households proportionally to the number of adolescents per community and interview only one adolescent per household. Also, the sample was calculated separately for each stratum to facilitate valid estimates for Quilombola and non-Quilombola populations.

The research population was estimated at 811 adolescents, divided into two strata: Quilombola ( $n = 350$ ) living in the Quilombola communities recognized by the FCP, and non-Quilombola ( $n = 461$ ). This sample universe was obtained from a survey carried out at the Family Health Units (USF) and confirmed in a subsequent mapping of the communities.

The following criteria were considered for the sample design: prevalence of 50%, given the heterogeneity of the events measured, an accuracy of 5%, a confidence level of 95% and design effect equal to 1.0, totaling 184 Quilombola and 210 non-Quilombola adolescents. An additional 15% was added to cater for possible losses. However, considering that only one adolescent per household would be interviewed and, among the Quilombola, the number of households would be exceeded, 7.1% were added for losses in this group.

Sampling for the non-Quilombola stratum was performed by randomly selecting households that contained adolescents, followed by their proportional distribution by community. Subsequently, adolescents were randomly selected by household. Concerning the Quilombola

stratum, we only proceeded with the random selection of adolescents by household. The presence of severe mental disorders with cognitive impairment among adolescents was an exclusion criterion.

The tool used to conduct interviews was a structured questionnaire based on surveys conducted in Brazil. For this study, questions were drawn from the National School Health Survey (PeNSE)<sup>19</sup>, the National Health Survey (PNS)<sup>20</sup> and the National Oral Health Survey (SBBrazil)<sup>21</sup>.

The questionnaire was divided into two blocks, the first one containing questions about household and economic characteristics was answered by the adolescent (when aged  $\geq 18$  years) or by the person responsible. The second block was responded to only by adolescents, containing information about them.

A pilot study was conducted in December 2014 with rural adolescents not belonging to the primary research. Data were collected between January and May 2015. Re-interviews were carried out in 5% of the sample households within seven days after the first interview, to ensure data quality.

Oral hygiene habits were evaluated based on the frequency of tooth brushing and flossing. The rate of tooth brushing was obtained from the question *In the last 30 days, how many times a day did you usually brush your teeth?* With the following answer options: a) I have not brushed my teeth in the last 30 days; b) Once a day; c) Twice a day; d) Three times a day; e) Four or more times a day; and f) I did not brush my teeth daily. The flossing was obtained from the following question *What do you use to clean your mouth?*, where one of the secondary questions was *Dental floss?* (No;Yes). For purposes of bivariate and multivariate analyses, the following were considered as outcomes: (1) unsatisfactory tooth brushing frequency when less than three times a day; (2) non-flossing.

The independent variables were selected considering a conceptual model based on Petersen<sup>22</sup>, organized in two blocks. The first block had sociocultural and environmental factors and the second block had variables related to the use of dental services.

Sociocultural factors were: economic level<sup>23</sup> (B and C – higher levels; D and E – lower level); gender; skin color/ethnicity, classified as black (brown and black) and non-black (white, yellow and indigenous); age; schooling; one dose of alcoholic beverage; tobacco use; trying out illicit drugs; physical activity; number of close friends;

family composition; feeling lonely in the last 12 months; parental understanding of personal problems in the previous 30 days.

Having as the primary source of water supply the general distribution network was considered an environmental factor, as well as the habit of hand hygiene before meals. The second block was composed of the following variables: oral health self-assessment; perception of the need for dental treatment; dental pain in the last six months; and dental consultation in the last year.

A descriptive analysis of oral health-related characteristics was made through the distribution of frequencies for the total sample and by stratum, Quilombola and non-Quilombola, as well as the estimation of the prevalence of tooth brushing and dental flossing. Differences between proportions were assessed by Pearson's chi-square test and Fisher's exact test.

A bivariate analysis was performed to identify the variables associated with poor tooth brushing and non-flossing. Estimates of prevalence ratios and confidence intervals were made using Poisson regression with a robust variance for the total sample and by stratum. All variables with a level of significance lower than 20% were included in the multiple analysis.

The hierarchical entry of variables in blocks was adopted in the multiple analysis. First block variables remained as adjustment factors for the second hierarchically lower block, and those with a p-value  $< 0.05$  remained in the model. The comparison between models was made by the Akaike criterion and Bayesian information. The adequacy of values predicted by the models to the observed values was evaluated by chi-square. Stata, version 15.0 (Stata Corporation, College Station, USA) was used for data analysis.

## Results

A total of 390 adolescents were interviewed, of which 42.8% (167) were Quilombola. Tooth brushing less than three times a day was observed in 33.3% of the total sample, 32.7% of non-Quilombola adolescents and 34.1% of Quilombola (Figure 1A). The prevalence of non-flossing was 46.7% for the total number of adolescents and 46.2% and 47.3% among non-Quilombola and Quilombola, respectively (Figure 1B). No significant differences were found between the two strata evaluated.

Most adolescents reported using toothbrush and toothpaste (99.7%) to perform oral hygiene,

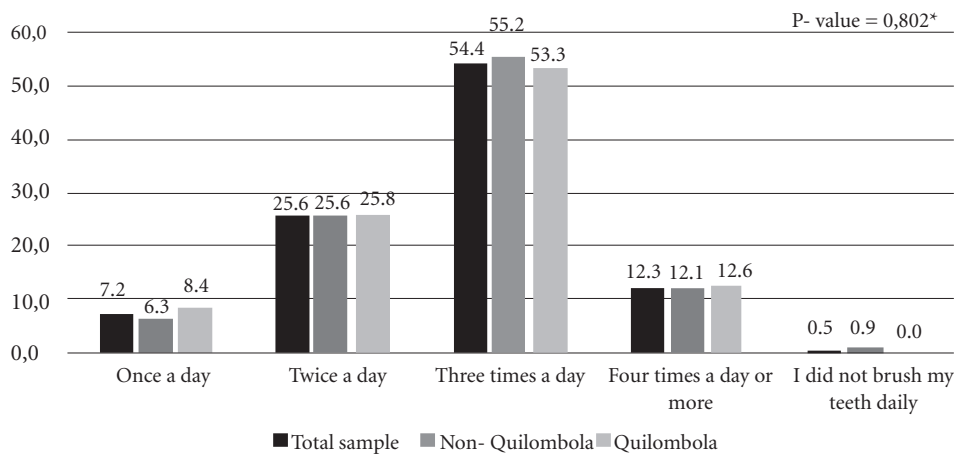
and 49.5% stated that they would replace the toothbrush with less than three months of use. Regarding oral health, 63.0% of adolescents considered their oral health to be good or very good, 48.1% reported a need for dental treatment and 2.6% for total dental prosthesis, 19.6% reported dental pain in the last six months and 73.1% said they were satisfied or very satisfied with their teeth and mouth (Table 1).

Of the total number of adolescents, 15.6% reported no dental appointments in their lifetime and 33.2% had no dental appointments in the last year. Of the adolescents who had already had a dental appointment, 67.8% used the public

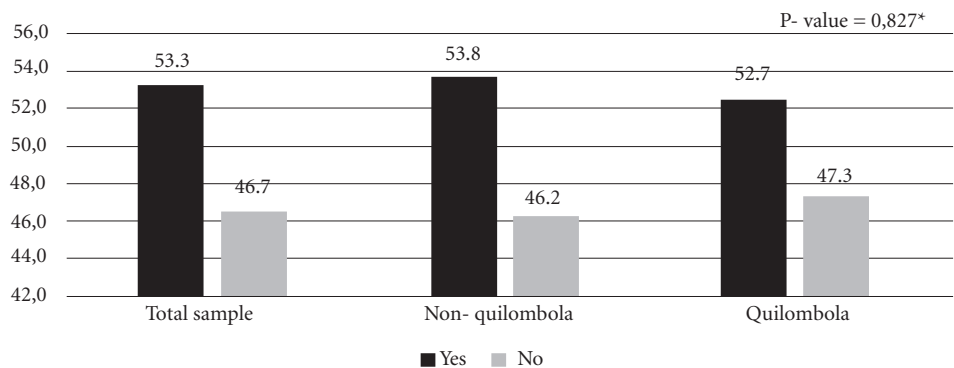
service and 66.8% were attended to in anFHU, 50.8% did so for cleaning, maintenance, revision or prevention purposes, 41.9% due to tooth pain, extraction, gum problems and dental treatment and 7.3% due to orthodontic appliance maintenance or budgets, and 85.4% considered the last appointment good or very good. Differences between Quilombola and non-Quilombola adolescents were observed only for the variable dental appointment in the lifetime, where 22.7% and 10.3% reported no consultation, respectively (Table 1).

Unsatisfactory tooth brushing was significantly higher in male adolescents, who did not

A- Toothbrushing



B- Flossing



A - Toothbrushing

B - Flossing

\* p-value calculated by the Pearson chi-square test for comparison between Quilombola and non-Quilombola

**Figure 1.** Prevalence of tooth brushing and flossing in the total sample, non-Quilombola and Quilombola. Bahia, 2015.

**Table 1.** Characteristics related to oral health in the total sample, Quilombola and non-Quilombola adolescents. Bahia, 2015.

Variables	Total		Non-Quilombola		Quilombola		P- Value <sup>‡</sup>
	n*	(%) <sup>†</sup>	n*	(%) <sup>†</sup>	n*	(%) <sup>†</sup>	
Use of toothbrush							1.000
No	1	0.3	1	0.4	0	0.0	
Yes	389	99.7	222	99.6	167	100.0	
Use of toothpaste							1.000
No	1	0.3	1	0.4	0	0.0	
Yes	389	99.7	222	99.6	167	100.0	
Toothbrush replacement							0.156
Less than 3 months	193	49.5	119	53.4	74	44.3	
Between 3 months and less than 6 months	155	39.7	84	37.7	71	42.5	
Between 6 months and more / Never replaced	42	10.8	20	9.0	22	13.2	
Oral health self-assessment							0.375
Very good / good	245	63.0	144	64.9	101	60.5	
Fair / poor / very poor	144	37.0	78	35.1	66	39.5	
Dental treatment required							0.577
No	202	51.9	118	53.1	84	50.3	
Yes	187	48.1	104	46.9	83	49.7	
Total dental prosthesis required							0.855
No	380	97.4	217	97.3	163	97.6	
Yes	10	2.6	6	2.7	4	2.4	
Dental pain in the last six months							0.521
No	312	80.4	181	81.5	131	78.9	
Yes	76	19.6	41	18.4	35	21.1	
Satisfaction with teeth/mouth							0.251
Very satisfied / Satisfied	285	73.1	165	74.0	120	71.9	
Neither satisfied nor dissatisfied	71	18.2	43	19.3	28	16.8	
Dissatisfied / Very dissatisfied	34	8.7	15	6.7	19	11.4	
Dental consultation in lifetime							0.001
Yes	329	84.4	200	89.7	129	77.3	
No	61	15.6	23	10.3	38	22.7	
Dental consultation in the last year							0.431
Yes	260	66.8	152	68.5	108	64.7	
No	129	33.2	70	31.5	59	35.3	
Type of service last dental consultation							0.706
Private service	106	32.2	66	33.0	40	31.0	
Public service	223	67.8	134	67.0	89	69.0	
Location of last dental consultation							0.231
Family Health Facility	219	66.8	126	63.3	93	72.1	
Private practice or private clinic	88	26.8	58	29.2	30	23.3	
Other	21	6.4	15	7.5	6	4.6	
Reason for last dental consultation							0.227
Cleaning, maintenance, review or prevention	167	50.8	106	53.0	61	47.3	
Toothache / Extraction / Gum Problems / Dental Treatment	138	41.9	77	38.5	61	47.3	
Orthodontic appliance / Budget / Other	24	7.3	17	8.5	7	5.4	
Assessment of last dental consultation							0.730
Very good / Good	281	85.4	170	85.0	111	86.0	
Fair	35	10.6	23	11.5	12	9.3	
Poor / Very poor	13	4.0	7	3.5	6	4.7	

\*n: number of individuals; †Relative frequency; ‡P-Value calculated by chi-square for comparison between Quilombola and Non-Quilombola strata.

live with both parents, did not practice hand hygiene before meals often and considered their oral health to be either fair, poor or very poor (Table 2).

Among non-Quilombola adolescents, a positive and significant association was observed between unsatisfactory tooth brushing and males, not living with both parents, with a lower frequency of hand hygiene before meals and no dental consultation in the last year. A negative association with parental understanding of their problems was sometimes observed in the last 30 days. In the Quilombola stratum, tooth brushing less than three times a day was more prevalent among those who did not wash their hands before meals frequently and those who reported worse oral health (Table 2).

Regarding the non-flossing, a positive and significant association with economic level E was observed in the total sample, lack of the general distribution network as the primary form of water supply, rare or no hand hygiene before meals, and fair, poor or very poor oral health. A negative association was observed with the highest age and schooling (Table 3).

The non-flossing was more prevalent among non-Quilombola adolescents of economic level E, who reported not washing their hands before meals frequently and did not consult a dentist in the last year, and less prevalent among older adolescents and higher schooling. Among the Quilombola, a positive association was observed with parents never or rarely understanding personal problems in the last 30 days and with the lack of the general network of distribution as the primary form of water supply and negative with the higher age and not having consulted the dentist in the last year (Table 3).

The following factors were independently associated with unsatisfactory tooth brushing in the total sample: being male (PR = 1.45, 95% CI = 1.10-1.92); living only with one of the parents or not living with the parents (PR = 1.45, 95% CI = 1.11-1.90); hand hygiene before meals sometimes, rarely or not at all (PR = 1.72, 95% CI = 1.32-2.24); and reporting poor or very poor oral health (OR = 1.38, 95% CI = 1.05-1.82). Concerning the non-Quilombola stratum, being male (PR = 1.96, 95% CI = 1.32-2.91), living only with one of the parents or not living with the parents (PR = 1.57, 95% CI = 1.12-2.21), hand hygiene before meals sometimes, rarely or not at all (PR = 1.91, 95% CI = 1.36-2.68) and not having consulted a dentist in the last year (PR = 1.50, 95% CI = 1.04-2.16) were positively associated.

Concerning the quilombola, a positive association was found with hand hygiene before meals (sometimes, frequently) (PR = 1.59, 95% CI = 1.05-2.40) and poor or very poor oral health (PR = 1.72, CI 95% = 1.12-2.62) (Table 4).

The non-flossing in the total sample was independently associated with the economic level E (PR = 1.54, CI95% = 1.19-2.01), age (PR = 0.91, CI95% = 0.88-0.95), hand hygiene before meals (sometimes, rarely or not at all) (PR = 1.53, 95% CI = 1.25-1.88) and reporting poor or very poor oral health (PR = 1.33, 95 % CI = 1.09-1.64) (Table 4).

Among non-quilombola adolescents, the following were independently associated with non-flossing: economic level E (PR = 1.57, 95% CI = 1.12-2.22), age (PR = 0.91 95% CI = 0.86-0.95), hand hygiene before meals (sometimes, rarely or not at all) (PR = 1.71, 95% CI = 1.31-2.23) and not having consulted the dentist in the last year (PR = 1.31 95% CI = <1.00-1.71). In the Quilombola, a positive association was found with the parents' understanding of personal problems – sometimes or rarely in the last 30 days (PR = 1.51, 95% CI = 1.04-2.20), sometimes and (PR = 1.64, 95% CI = 1.11-2.42) never or rarely, lack of general distribution network as the main form of water supply (PR = 1.46, 95% CI = 1.07-2.00) and reporting poor or very poor oral health (OR = 1.51, 95% CI = 1.12-2.05) and negative association with having older age (PR = 0.91, 95% CI = 0.86-0.97) (Table 4).

## Discussion

Satisfactory oral hygiene, tooth brushing and flossing habits were found in most of the study population. Quilombola and non-Quilombola adolescents did not differ about the prevalence of these habits. However, differences were found in sociocultural and environmental factors and factors related to the use of the dental services associated with these practices.

Freire *et al.*<sup>10</sup>, in a study with Brazilian ninth-graders of elementary school, found results similar to this study for tooth brushing  $\geq$  two times/day in 2009 (95.2%) and 2012 (91.7%). However, brushing  $\geq 3x$  / day, indicated by several studies such as the recommended daily rate for adolescence, had a lower prevalence than that found among adolescents from different Brazilian regions<sup>4,7,8,24</sup>. Flossing was higher than reported by studies with children and adolescents (9-12 years) in rural Pernambuco (33.3%)<sup>13</sup>, with rural



**Table 2.** Prevalence, prevalence ratio and 95% confidence interval of tooth brushing less than three times a day for the total sample, Non-Quilombola and Quilombola. Bahia, 2015.

Variables	Total sample				Non- Quilombola				Quilombola			
	n*	P (%)†	RP‡	IC95%§	n*	P (%)†	RP‡	IC95%§	n*	P (%)†	RP‡	IC95%§
Sociocultural factors												
Economic level												
B and C	46	30.5	1.00	-	34	30.6	1.00	-	12	30.0	1.00	-
D	64	35.0	1.15	0.84–1.59	33	35.9	1.17	0.79–1.73	31	34.1	1.13	0.65–1.98
E	20	35.8	1.17	0.76–1.80	6	30.0	0.97	0.47–2.02	14	38.9	1.29	0.69–2.43
Gender												
Female	56	28.0	1.00	-	25	22.9	1.00	-	31	34.1	1.00	-
Male	74	38.9	1.39	1.04–1.85	48	42.1	1.83	1.22–2.75	26	34.2	1.00	0.65–1.53
Skin color												
Non-black	31	33.7	1.00	-	22	33.8	1.00	-	9	33.3	1.00	-
Black	99	33.2	0.98	0.70–1.37	51	32.3	0.95	0.63–1.44	48	34.3	1.03	0.57–1.84
Age	130	-	0.98	0.93–1.03	73	-	0.99	0.93–1.06	57	-	0.95	0.88–1.03
Schooling	130	-	0.98	0.93–1.03	73	-	0.98	0.91–1.05	57	-	0.98	0.90–1.07
Experimentation of alcoholic beverage												
No	88	31.4	1.00	-	48	31.4	1.00	-	40	31.5	1.00	-
Yes	42	38.2	1.21	0.90–1.63	25	35.7	1.13	0.77–1.69	17	42.5	1.34	0.86–2.10
Experimentation of tobacco												
No	124	33.5	1.00	-	68	32.3	1.00	-	56	35.2	1.00	-
Yes	6	30.0	0.89	0.45–1.78	5	41.8	1.29	0.64–2.60	1	12.5	0.35	0.05–2.25
Experimentation of illicit drugs												
No	127	33.2	1.00	-	70	32.1	1.00	-	57	34.5	-	-
Yes	3	42.9	1.29	0.54–3.07	3	60.0	1.86	0.89–3.93	0	0.00	-	-
Physical activity												
Higher or equal to 300 min/week	63	35.2	1.00	-	37	36.6	1.00	-	26	33.3	1.00	-
Less than 300 min/week	67	31.7	0.90	0.68–1.19	36	29.5	0.80	0.55–1.17	31	34.8	1.04	0.68–1.60
Close friends												
Up to 2 friends	18	27.3	1.00	-	12	30.7	1.00	-	6	22.2	1.00	-
3 or more	112	34.6	1.26	0.83–1.93	61	33.1	1.07	0.64–1.80	51	36.4	1.63	0.78–3.44
Household composition												
Living with father and mother	77	29.2	1.00	-	44	28.0	1.00	-	33	30.8	1.00	-
Living only with father or mother / Not living with parents	53	42.1	1.44	1.09–1.90	29	43.9	1.57	1.08–2.27	24	40.0	1.30	0.85–1.98
Feeling of loneliness												
Never or rarely	77	31.2	1.00	-	44	31.4	1.00	-	33	30.9	1.00	-
Sometimes / Most of the time / Always	53	37.1	1.19	0.89–1.58	29	34.9	1.11	0.76–1.63	24	40.0	1.30	0.85–1.98
Parents understand problems												
Most of the time or always	56	34.4	1.00	-	36	38.7	1.00	-	20	28.6	1.00	-
Sometimes	35	28.3	0.82	0.58–1.17	15	21.1	0.54	0.32–0.92	20	37.7	1.32	0.79–2.19
Never or rarely	37	37.8	1.09	0.79–1.53	21	38.2	0.99	0.64–1.51	16	37.2	1.30	0.79–2.23

it continues

and urban adolescents in Campina Grande (PB) (0.5%)<sup>8</sup> and urban adolescents from other Brazilian regions<sup>4,7</sup>. International studies showed a lower prevalence of tooth brushing and flossing<sup>11,25-37</sup>.

The literature evidences that Brazilians have a reasonable frequency in oral hygiene habits. However, the quality of this hygiene can leave something to be desired<sup>1</sup>. This situation contrib-

**Table 2.** Prevalence, prevalence ratio and 95% confidence interval of tooth brushing less than three times a day for the total sample, Non-Quilombola and Quilombola. Bahia, 2015.

Variables	Total sample				Non- Quilombola				Quilombola			
	n*	P (%)†	RP‡	IC95%§	n*	P (%)†	RP‡	IC95%§	n*	P (%)†	RP‡	IC95%§
Environmental factors												
Water supply by the general distribution network												
Yes	101	31.5	1.00	-	61	31.6	1.00	-	40	31.2	1.00	-
No	28	41.2	1.30	0.94 – 1.81	12	40.0	1.26	0.78 – 2.06	16	42.1	1.35	0.85 – 2.12
Hand hygiene before meals												
Most of the time or always	74	27.2	1.00	-	42	26.2	1.00	-	32	28.6	1.00	-
Sometimes / never / rarely	56	47.5	1.74	1.33 – 2.29	31	49.2	1.87	1.30 – 2.69	25	45.5	1.59	1.05 – 2.40
Use of dental services												
Oral health self-assessment												
Very good / good	67	27.3	1.00	-	41	28.5	1.00	-	26	25.7	1.00	-
Fair / poor / very poor	62	43.1	1.57	1.19 – 2.09	31	39.8	1.39	0.95 – 2.03	31	47.0	1.82	1.20 – 2.78
Dental treatment required												
No	69	34.2	1.00	-	41	34.7	1.00	-	28	33.3	1.00	-
Yes	60	32.1	0.94	0.71 – 1.25	31	29.8	0.86	0.58 – 1.26	29	34.9	1.04	0.69 – 1.60
Dental pain in the last six months												
No	107	34.3	1.00	-	63	34.8	1.00	-	44	33.6	1.00	-
Yes	21	27.6	0.80	0.54 – 1.20	9	21.9	0.63	0.34 – 1.16	12	34.3	1.02	0.60 – 1.72
Dental consultation in the last year												
Yes	79	30.4	1.00	-	41	27.0	1.00	-	38	35.2	1.00	-
No	51	39.5	1.30	0.98 – 1.73	32	45.7	1.69	1.17 – 2.44	19	32.2	0.92	0.58 – 1.44

\*n: number of individuals; †P: prevalence of tooth brushing less than three times a day; ‡PR: prevalence ratio; § CI95%: 95% confidence interval.

utes to the fact that the eradication of oral diseases in the country is still a distant reality. It is emphasized that not only individual practices are responsible for oral health care but, when other types of social policies are lacking, these practices become even more crucial<sup>1</sup>.

Quilombola and non-Quilombola adolescents did not differ about the prevalence of tooth brushing and flossing, but differences were found in the use of dental services during lifetime and factors associated with poor oral hygiene habits, evidencing that there are specificities among these groups.

The similar prevalence of health-related behavioral aspects between Quilombola and non-Quilombola was also reported by Silva *et al.*<sup>28</sup>, in a study about tobacco experimentation in this same population. It is suggested that the social interaction of these adolescents in school could favor the mutual influence between them, transposing effects of the family, the environment and their neighborhood<sup>11,29</sup>. This interaction is even more evident in rural areas, where

the supply of educational services is reduced when compared to urban ones.

The difference about performing dental consultations during lifetime can be explained, in part, by the location of USFs, which, are mostly based in non-Quilombola communities. The actions of health teams in Quilombola communities take place about once a month in satellite units that do not have the necessary infrastructure for dental consultation<sup>29</sup>. Thus, dental care is restricted to USF headquarters and educational actions are carried out in other communities. These facts add up to the obligatory presence of a responsible person over 18 years of age for the first dental care of the adolescent<sup>30</sup>, which increases the difficulty of the first access of Quilombola adolescents to dental services. When studying the use of health services by the adult Quilombola population of Vitória da Conquista (BA), Gomes *et al.*<sup>31</sup> suggested that there is a higher difficulty in accessing services by Quilombola due to the inequities faced by this population, especially worse social and economic conditions.



**Table 3.** Prevalence, prevalence ratio and 95% confidence interval of non-use of dental floss for the total sample, Non-Quilombola and Quilombola. Bahia, 2015.

Variables	Total Sample				Non-Quilombola				Quilombola			
	n*	P (%)†	PR‡	CI95%§	n*	P (%)†	PR‡	CI95%§	n*	P (%)†	PR‡	CI95%§
Sociocultural factors												
Economic level												
B and C	64	42.4	1.00	-	47	42.3	1.00	-	17	42.5	1.00	-
D	81	44.3	1.04	0.81 – 1.34	42	45.6	1.08	0.79 – 1.47	39	42.9	1.01	0.65 – 1.55
E	37	66.1	1.56	1.20 – 2.03	14	70.0	1.65	1.15 – 2.37	23	63.9	1.50	0.97 – 2.33
Gender												
Female	89	44.5	1.00	-	47	43.1	1.00	-	42	46.1	1.00	-
Male	93	48.9	1.10	0.89 – 1.36	56	49.1	1.14	0.85 – 1.52	37	48.7	1.05	0.76 – 1.45
Skin color												
Non-black	49	53.3	1.00	-	34	52.3	1.00	-	15	55.6	1.00	-
Black	133	44.6	0.84	0.66 – 1.05	69	43.7	0.83	0.62 – 1.12	64	45.7	0.82	0.56 – 1.21
Age	182	-	0.91	0.88 – 0.95	103	-	0.91	0.86 – 0.96	79	-	0.91	0.86 – 0.97
Schooling	182	-	0.92	0.89 – 0.96	103	-	0.91	0.87 – 0.96	79	-	0.94	0.88 – 1.00
Experimentation of alcoholic beverage												
No	131	46.8	1.00	-	72	47.1	1.00	-	59	46.5	1.00	-
Yes	51	46.4	0.99	0.78 – 1.25	31	44.3	0.94	0.69 – 1.29	20	50.0	1.08	0.75 – 1.55
Experimentation of tobacco												
No	173	46.8	1.00	-	98	46.4	1.00	-	75	47.2	1.00	-
Yes	9	45.0	0.96	0.58 – 1.58	5	41.7	0.90	0.45 – 1.78	4	50.0	1.06	0.52 – 2.16
Experimentation of illicit drugs												
No	178	46.5	1.00	-	100	45.8	1.00	-	78	47.3	1.00	-
Yes	4	57.1	1.23	0.64 – 2.36	3	60.0	1.31	0.63 – 2.72	1	50.0	1.06	0.26 – 4.29
Physical activity												
Higher or equal to 300 min/week	81	45.3	1.00	-	47	46.5	1.00	-	34	43.6	1.00	-
Less than 300 min/week	101	47.8	1.05	0.85 – 1.31	56	45.9	0.99	0.74 – 1.31	45	50.6	0.43	0.84 – 1.61
Close friends												
Up to 2 friends	26	39.4	1.00	-	18	46.1	1.00	-	8	29.6	1.00	-
3 or more	156	48.1	1.22	0.89 – 1.68	85	46.2	1.00	0.69 – 1.45	71	50.7	1.71	0.94 – 3.13
Household composition												
Living with father and mother	128	48.5	1.00	-	75	47.8	1.00	-	53	49.5	1.00	-
Living only with father or mother / Not living with parents	54	42.9	0.88	0.69 – 1.12	28	42.4	0.89	0.64 – 1.23	26	43.3	0.87	0.62 – 1.24
Feeling of loneliness												
Never or rarely	113	45.7	1.00	-	62	44.3	1.00	-	51	47.7	1.00	-
Sometimes / Most of the time / Always	69	48.2	1.05	0.85 – 1.31	41	49.4	1.12	0.84 – 1.49	28	46.6	0.98	0.70 – 1.37
Parents understand problems												
Most of the time or always	75	46.0	1.00	-	49	52.7	1.00	-	26	37.1	1.00	-
Sometimes	56	45.2	0.98	0.76 – 1.27	28	38.4	0.74	0.53 – 1.06	28	52.8	1.42	0.95 – 2.11
Never or rarely	50	51.2	1.10	0.86 – 1.43	25	45.4	0.86	0.61 – 1.22	25	58.1	1.56	1.05 – 2.33
Environmental factors												
Water supply by the general distribution network												
Yes	140	43,6	1,00	-	87	45,1	1,00	-	53	41,4	1,00	-
No	41	60,3	1,38	1,10 – 1,74	16	53,3	1,18	0,82 – 1,71	25	65,8	1,59	1,17 – 2,16

it continues

**Table 3.** Prevalence, prevalence ratio and 95% confidence interval of non-use of dental floss for the total sample, Non-Quilombola and Quilombola. Bahia, 2015.

Variables	Total Sample				Non-Quilombola				Quilombola			
	n*	P (%)†	PR‡	CI95%§	n*	P (%)†	PR‡	CI95%§	n*	P (%)†	PR‡	CI95%§
Hand hygiene before meals												
Most of the time or always	111	40,8	1,00	-	62	38,7	1,00	-	49	43,7	1,00	-
Sometimes / never / rarely	71	60,2	1,47	1,20 – 1,81	41	65,1	1,68	1,29 – 2,19	30	54,5	1,25	0,90 – 1,72
Use of dental services												
Oral health self-assessment												
Very good / good	103	42,0	1,00	-	61	41,4	1,00	-	42	41,6	1,00	-
Fair / poor / very poor	78	54,2	1,29	1,04 – 1,59	41	52,6	1,24	0,93 – 1,65	37	56,1	1,35	0,98 – 1,85
Dental treatment required												
No	92	45,5	1,00	-	51	43,2	1,00	-	41	48,8	1,00	-
Yes	89	47,6	1,04	0,84 – 1,29	51	49,0	1,13	0,85 – 1,51	38	45,8	0,94	0,68 – 1,29
Dental pain in the last six months												
No	148	47,4	1,00	-	86	47,5	1,00	-	62	47,3	1,00	-
Yes	32	42,1	0,89	0,66 – 1,18	16	39,0	0,82	0,54 – 1,24	16	45,7	0,96	0,64 – 1,45
Dental consultation in the last year												
Yes	119	45,8	1,00	-	61	40,1	1,00	-	58	53,7	1,00	-
No	62	48,1	1,05	0,84 – 1,31	41	58,6	1,45	1,11 – 1,93	21	35,6	0,66	0,45 – 0,97

\*n: number of individuals; †P: prevalence of non-use of dental floss; ‡PR: prevalence ratio; § CI95%: 95% confidence interval.

Male adolescents had a higher prevalence of unsatisfactory tooth brushing, a result corroborated by other studies<sup>7-10</sup>. This behavior can be explained by a greater concern of adolescent girls regarding aesthetics and care with oral hygiene due to current social and cultural standards<sup>32</sup>. However, this difference between genders was not observed in the Quilombola stratum and more studies are required to understand the specificities of this group better.

The socioeconomic condition was only associated with the use of dental floss in the total sample and among non-Quilombola, a result similar to other studies with adolescents<sup>7,33</sup>. Dental floss, compared to toothbrushes, is a more expensive product and its use is a less consolidated habit, which may have influenced the greater use of better-off adolescents<sup>36</sup>. The National Oral Health Policy – *Programa Brasil Sorridente* (Smiling Brazil Program), provides for the availability of basic dental care appropriate to the population<sup>34</sup>. However, not only toothbrush and fluoride dentifrice would be necessary, but also the

distribution of dental floss, which would possibly reduce the effect of economic conditions on habit-forming.

The greater homogeneity of the Quilombola population about the economic level may have contributed to the absence of this variable in the final model for this stratum. Also, it is local practice to carry out educational activities with the rural population on the making of dental floss in a handmade fashion (raffia) using lineage bags, material easily accessible in rural and Quilombola communities, by professionals of the oral health teams.

The one-year age increase reduced the prevalence of non-use of dental floss by around 9%, a relationship already evidenced in a study with adolescents from Paraíba<sup>8</sup>. The greatest attention to oral health is related to affectivity and social interaction<sup>35</sup>, aspects that can contribute to greater care among older adolescents.

Family aspects influenced oral hygiene habits of rural adolescents, a result corroborated by other studies. Davoglio et al.<sup>7</sup> argue that when

**Table 4.** Factors associated with tooth brushing less than three times a day and non-use of dental floss, according to the regression model, for the total sample, non-Quilombola and Quilombola. Bahia, 2015.

Unsatisfactory dental brushing						
Variables	Total Sample		Non-Quilombola		Quilombola	
	PR*	CI95%†	PR*	CI95%†	PR*	CI95%†
Gender						
Female	1.00	-	1.00	-	-	-
Male	1.45	1.10 – 1.92	1.96	1.32 – 2.91	-	-
Household composition						
Living with father and mother	1.00	-	1.00	-	-	-
Living only with one of the parents or not living with parents	1.45	1.11 – 1.90	1.57	1.12 – 2.21	-	-
Hand hygiene before meals						
Most of the time or always	1.00	-	1.00	-	1.00	-
Sometimes / never / rarely	1.72	1.32 – 2.24	1.91	1.36 – 2.68	1.59	1.05 – 2.40
Oral health self-assessment						
Very good / good	1.00	-	-	-	1.00	-
Fair / poor / very poor	1.38	1.05 – 1.82	-	-	1.72	1.12 – 2.62
Dental consultation in the last year						
Yes	-	-	1.00	-	-	-
No	-	-	1.50	1.04 – 2.16	-	-
Non-use of dental floss						
Variables	Total Sample		Non-Quilombola		Quilombola	
	PR*	CI95%†	PR*	CI95%†	PR*	CI95%†
Economic level						
B and C	1.00	-	1.00	-	-	-
D	1.03	0.82 – 1.31	1.04	0.78 – 1.40	-	-
E	1.54	1.19 – 2.01	1.57	1.12 – 2.22	-	-
Age	0.91	0.88 – 0.95	0.91	0.86 – 0.95	0.91	0.86 – 0.97
Parents understand problems						
Most of the time or always	-	-	-	-	1.00	-
Sometimes	-	-	-	-	1.51	1.04 – 2.20
Never or rarely	-	-	-	-	1.64	1.11 – 2.42
Water supply by the general distribution network						
Yes	-	-	-	-	1.00	-
No	-	-	-	-	1.46	1.07 – 2.00
Hand hygiene before meals						
Most of the time or always	1.00	-	1.00	-	-	-
Sometimes / never / rarely	1.53	1.25 – 1.88	1.71	1.31 – 2.23	-	-
Oral health self-assessment						
Very good / good	1.00	-	-	-	1.00	-
Fair / poor / very poor	1.33	1.09 – 1.64	-	-	1.51	1.12 – 2.05
Dental consultation in the last year						
Yes	-	-	1.00	-	-	-
No	-	-	1.31	<1.00 – 1.71	-	-

\*PR: adjusted prevalence ratio; †CI95%: 95% confidence interval

parents do not understand adolescents, they may assume a disinterested posture vis-à-vis their appearance and self-care as a form of protest. Also, individuals who live alone or who have low sat-

isfaction with their social relationships tend to adopt less preventive health behaviors<sup>36</sup>.

These findings show that health care with a focus on families can bring good results to ado-

lescents' oral health. Considering that the Family Health Strategy is commonly present in rural areas, family core-oriented educational activities could be developed by oral health teams, as well as by community health workers, mainly through home visits.

Oral hygiene is a physical hygiene component but requires learning<sup>34</sup> to be carried out correctly. Studies show that oral hygiene is significantly associated with regular hygiene habits<sup>9,37</sup>. In this study, dental brushing  $\leq$  threetimes/day and non-use of dental floss were more prevalent among adolescents who reported not washing their hands before meals frequently.

Among the Quilombola, non-use of dental floss was more prevalent in adolescents who did not have the general distribution network as their primary source of water supply at home, which reinforces the vulnerability and need for self-care practices in this group, since it has less continuous access to fluoridated water. Public water fluoridation has been mandatory in Brazil since 1974. However, non-universal access to fluoridated water keeps an extensive number of people on the fringe of this admittedly effective and cost-effective relationship<sup>38</sup>.

Self-assessment of oral health as fair, poor or very poor was one of the variables associated with poor oral hygiene habits. The agreement between the clinical condition and self-perceived oral health usually occurs in more severe painful and aesthetic cases, while other milder oral problems are underestimated<sup>39</sup>. Poor oral condition has negative impacts on the daily activities of adolescents, among them, the greater difficulty in tooth brushing. Less frequent tooth brushing may, therefore, be a consequence of poor oral condition, which may influence the outcome found in this study. It should be emphasized that the perception of oral health is also related to socio-cultural and personal characteristics of individuals<sup>39</sup>.

The lack of dental consultation in the last year was a factor that increased poor oral hygiene habits only for the non-Quilombola stratum. The contact of the dental professional with the adolescent influences the adoption of satisfactory oral hygiene habits. However, although dental work is relevant, it solves individual problems

recognized by those who use it. In population terms, oral health care results from a range of factors – biological, psychological and social<sup>39</sup>.

This work has some limitations because it is a cross-sectional study, which prevents us from inferring the temporality of some of the associations observed. The sample size was not planned to test differences between Quilombola and non-Quilombola, so there may not have been enough sampling power for some variables. However, this fact does not compromise the differences observed and described. Also, no information was collected on the clinical conditions of the adolescents, the tooth brushing and use of dental floss technique, as well as hygiene hours, hindering the analysis of these aspects.

### Final considerations

Oral health policies are still recent in Brazil and aim to promote, prevent diseases and restore the oral health of individuals. However, practices aimed at recovery are again emphasized, which makes it necessary to redirect the work process to create support for comprehensive care and the needs of different population groups<sup>39</sup>.

The National Oral Health Policy Directives provide for supervised oral hygiene activities so that autonomy is developed to self-care<sup>34</sup>. However, these activities are commonly geared to children, not covering adolescents, especially older ones. Collective measures facilitate savings regarding financial and human resources and are fundamental within a single health system to ensure the integrality of care, especially in more vulnerable places such as rural areas and traditional communities.

Oral health care demands intersectoral actions that consider aspects inherent to adolescents, in their social/household context, with the purpose of promoting comprehensive and resolute adolescent oral health care. Health education actions should consider cultural traits and take into account that oral health is a component of health and transcends dentistry. The perception of oral health as a human right and not as a privilege should be increasingly strengthened, especially in populations of recognized vulnerability.

## Collaborations

The authors DS Medeiros and KC Santana participated in the conception of the study. The authors DS Medeiros and EKP Silva participated in the implementation of the study, analysis and interpretation of the results and writing of the article. The authors PR Santos, TPR Checker, CMA Melo and KC Santana participated in the interpretation of the results and writing of the article. The author MM Amorim participated in the interpretation of the results and carried out a relevant critical analysis of the intellectual content. All authors have read and approved the final version of this manuscript.

## Acknowledgments

We wish to thank the rural families and adolescents, interviewers, Community Health Workers and other professionals of the Family Health Strategy teams, who have been instrumental in the implementation of this work.

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Article submitted 31/10/2017

Approved 26/02/2018

Final version submitted 22/04/2018