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Sociodemographic and clinical aspects of quality of life related to oral health in adolescents

ABSTRACT

OBJECTIVE: To estimate the prevalence and to identify sociodemographic and oral health factors associated with the negative impact of oral health conditions on the quality of life in adolescents.

METHODS: Data from 5,445 adolescents aged 15-19, who took part in the Brazilian Oral Health Survey (SBBrazil 2010) were analyzed, using a multistage sampling design. The outcome was quality of life related to oral health, which was assessed using the *Oral Impacts on Daily Performance* questionnaire and analyzed as a discrete variable. The independent variables were sex, skin color, schooling, household income, age, untreated dental caries, malocclusion, gingival bleeding, dental calculus, and periodontal pocket. Poisson regression analysis was carried out and mean ratios (MR) with their respective 95% confidence intervals (95%CI) were presented.

RESULTS: Of the total, 39.4% reported at least one negative impact on their quality of life. After adjustment, the mean negative impact was 1.52 (95%CI 1.16;2.00) times higher in females and 1.42 (95%CI 1.01;1.99), 2.66 (95%CI 1.40;5.07) and 3.32 (95%CI 1.68;6.56) higher in those with brown, yellow, and indigenous skin color, respectively, when compared to those with white skin. The lower the level of schooling, the greater the negative impact (MR 2.11, 95%CI 1.30;3.41), likewise for individuals with household income below R\$ 500.00 (MR 1.84, 95%CI 1.06;3.17) compared with those with higher incomes. The greatest impact on quality of life was found among adolescents with four or more teeth with untreated dental caries (MR 1.53, 95%CI 1.12;2.10), one or more missing teeth (MR 1.44, 95%CI 1.16;1.80), those with dental pain (MR 3.62, 95%CI 2.93;4.46) and with severe (MR 1.52, 95%CI 1.04;2.23) and very severe malocclusion (MR 1.32, 95%CI 1.01;1.72).

CONCLUSIONS: Brazilian adolescents reported a high negative impact of oral health on their quality of life. Inequalities in distribution should be taken into account when planning preventive, monitoring and treatment strategies for oral health problems in groups with the highest impact on their quality of life.

DESCRIPTORS: Adolescent. Oral Health. Quality of Life. Socioeconomic Factors. Health Inequalities. Dental Health Surveys.

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INTRODUCTION

Over the last ten years, the World Health Organization has made great efforts to emphasize the importance of oral health conditions as an important and integral part of an individual's general health and quality of life.²⁰ Studies have shown the significant role played by oral health disorders such as dental pain and tooth loss, as well as problems related to severe malocclusion, in absenteeism both at school¹⁶ and at work.²² Moreover, problems related to dental appearance have been associated with bullying in schoolchildren.²⁴

In addition to clinical measures, epidemiological studies on oral health have used self-perceived oral health and the impact of oral health disorders on day-to-day life in order to estimate the impact of oral health problems on the individual's quality of life.² Specific instruments have been developed for this purpose, such as structured questionnaires validated for the Brazilian population and for other countries, which have provided support in prioritizing the allocation of resources for promoting health care and dental treatment as well as in the assessment and monitoring of sick individuals.¹³

Oral health disorders, dental pain,¹⁶ untreated dental caries,¹² gingival bleeding¹⁹ and dental crowding in anterior teeth¹ have been associated with negative impacts on the quality of life in children and adolescents. The adverse effects of these health conditions may be seen through different dimensions, such as: daily performance in eating and speaking, problems in relating with others as well as other functional, social and psychological limitations.^{7,19}

Although there has been a significant increase in the number of studies which have investigated the impact of oral health conditions on the adolescent's quality of life, these studies have, in general, been limited to a specific population such as schoolchildren, and they are rare in the Brazilian context. The majority of these studies investigated the psychometric properties of the questionnaires on quality of life related to oral health and its correlation with clinical oral health parameters; there are few studies which investigate the role of demographic and socioeconomic characteristics on the quality of life scores related to oral health.

The Oral Health Surveillance of the Ministry of Health carried out the Brazilian Oral Health Survey (SBBrazil 2010) which was pioneering in Brazil as it incorporated data collection, which enabled the impact of oral health on Brazilians' quality of life to be measured. These data, associated with other socioeconomic characteristics, allows social inequalities related to quality of life to be analyzed. The aim of this study was to estimate prevalence and identify sociodemographic factors and oral health problems associated with the negative

impacts of oral health conditions on the quality of life of Brazilian adolescents.

METHODS

Data from the Brazilian Oral Health Survey (SBBrazil) 2010 were used. A representative sample of the Brazilian population was interviewed and examined in the participants' homes in order to investigate the main oral health disorders as well as demographic and socioeconomic characteristics. This study included a sample of adolescents aged 15 to 19 who participated in the SBBrazil 2010 project.

All of the state capitals and the Federal District were included in the sample. Each region was represented by 30 municipalities in the interior (North, Northeast, Central-West, Southeast and South) being considered as domains in the study. A two-stage sampling scheme was adopted for the 26 state capitals and the Federal District and a three-stage sampling scheme for the municipalities in the interior of the five Brazilian macro regions. The primary sample units were: (a) municipality, for the interior, and (b) census tract for the state capitals. Individuals were randomly selected according to the number of permanent private urban residences in each census tract. This information was provided by the *Instituto Brasileiro de Geografia e Estatística* (IBGE, Brazilian Institute of Geography and Statistics) – from the 2007 national census and through the count of residences carried out in the SBBrazil 2010 considering data from 2000, as well as the proportion of individuals within each age group in the Brazilian age group pyramid. This process produced a sample interval which allowed individuals to be randomly selected in each age group. A total of 5,445 individuals aged 15 to 19 were interviewed and examined. Further information on the sampling procedure can be found elsewhere.²³

Clinical dental examinations and interviews through a structured questionnaire were performed. The questionnaire was designed especially for the research and a handheld Personal Digital Assistant, model P550, provided by the IBGE was used to collect the data. Prior to the field work, two pilot studies were carried out (one in Florianópolis, SC, and the other in João Pessoa, PB), in order to verify the coherence, logistics and feasibility of the study's instruments and the methodology. The consensus technique was used to train and calibrate the team.¹⁰ The inter-observer reliability was obtained through the weighted kappa coefficient. The kappa equal to 0.65 was considered the minimum acceptable value for all conditions under study.

Field work teams were formed of one examiner (dentist) and one interviewer, both of them from the *Sistema*

Único de Saúde (public health care system). with a total of ten teams in each state capital and from two to six teams for municipalities. Teams undertook 40 hours of training in regional workshops. All of the appropriate biosafety procedures were duly followed, such as using personal equipment, sterilizing instruments and proper disposal of materials.

Quality of life was investigated using the Oral Impacts on Daily Performance (OIDP) instrument.² The OIDP is composed of nine items related to day-to-day activities which could be affected by oral health conditions. The instrument includes physical, psychological and social aspects, and dimensions concerning eating, smiling, studying, speaking, doing sport, cleaning teeth, sleeping, and emotional aspects and social contact. Each item was preceded by the question, “Some people have problems which may have been caused by their teeth. Out of the following concerns, which apply to you in the last six months?”. The response options were: none (code 0) and yes (code 1) and don’t know or do not want to reply (code 9). Code 9 was treated as missing information for each OIDP question. Simple counting of the score was carried out using nine dummy variables (yes/no). OIDP (dependent variable) was analyzed as a discrete variable ranging from zero (no impact) to nine (impact in all nine dimensions).

The independent variables involved were demographic, socioeconomic, oral conditions and dental pain characteristics. Demographic data included, race/skin color and socioeconomic data referred to, schooling and household income. Race/skin color was classified according to IBGE (white, brown, black, yellow/asiatic and indigenous). The participants’ level of schooling was measured in terms of the number of successfully completed school years and categorized 0-4, 5-8, 9-11, and 12 or more years. Household income, reported by the head of family, was categorized as ≤ R\$ 500.00, R\$ 501.00 to R\$ 2.500.00 and ≥ R\$ 2.501.00. Oral health disorders evaluated were: dental caries, malocclusion, tooth loss and periodontal conditions. They were assessed according to their prevalence based on the indices proposed by the WHO for oral health care surveys.²⁷ Dental caries was assessed using the ‘decay’ component of the decayed, missing, filled teeth index (DMFT) categorized as none, 1 to 3 and ≥ 4. Malocclusion was assessed by the Dental Aesthetic Index (DAI) categorized according to need for treatment (none, defined malocclusion, severe and very severe).⁹ The ‘missing’ component of the DMFT index, dichotomized as 0 and ≥ 1, was used to assess tooth loss. The presence of gingival bleeding on probing (yes/no), dental calculus (yes/no) and some degree of periodontal pocket (yes/no) was obtained through six examinations sites of the index teeth of the Community Periodontal Index (CPI).²⁷ Dental pain was recorded

using the question “Have you experienced dental pain in the last 6 months?” (yes/no).

Data analysis was carried out using STATA 11.0 statistical software, considering the complex sampling cluster design and sampling weight using the svyset command. Statistical analysis included the sample distribution according to the levels of OIDP index (0, 1 and ≥ 2 impacts) and the categories of the independent variables. The association between the independent variables and the OIDP index (outcome), analyzed as a discrete variable, was tested using Poisson regression, providing estimates of mean ratios (MR), crude and adjusted analysis with respective 95% confidence intervals. In order to analyze potential predictive factors for OIDP, a hierarchical model was performed for multivariable analysis.²⁶ The independent variables were introduced into the model based on most distal to proximal variables, according to the adopted theoretical model (Figure 1). The first level of the model included demographic variables (sex, race/skin color and age), the second level socio-economic variables (adolescents’ household income and schooling) and the third level oral health disorders (Figure 1). All variables with p value ≤ 0.20 (Wald statistics) in the crude analysis were included in the multivariable model. The cutoff point of p ≤ 0.20 was used to maintain the variables in the model considering the potential confounders. In the final model, those variables with values of p < 0.05 after adjusting for variables at the same level and those in the upper levels, were considered to be statistically significant.

The SBBrazil 2010 Project followed the requirements of the Declaration of Helsinki and was approved by the *Conselho Nacional de Ética em Pesquisa*, record no. 15,498, 7th January 2010.

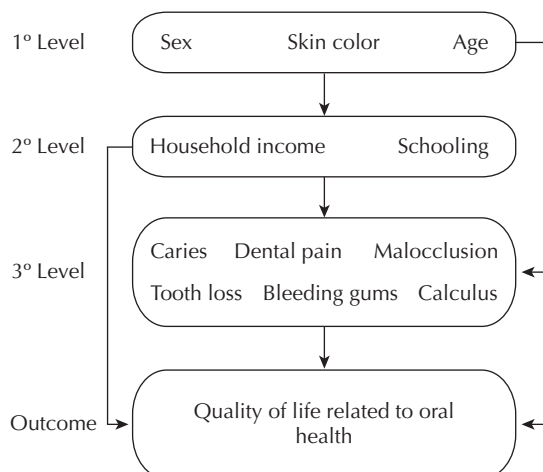


Figure 1. Theoretical model of hierarchical analysis.

Table 1. Sample distribution of sociodemographic and dental status according to Oral Impacts on Daily Performance levels (n, %) in Brazilian adolescents. SBBrazil 2010. (n = 5,445)

Variables	Sample distribution		OIDP % (95%CI)		
	n	%	= 0	= 1	≥ 2
Total	5,445	100.0	60.6 (55.9;65.4)	16.9 (13.3;20.4)	22.5 (18.2;26.6)
Sex					
Male	2,497	48.6	66.3 (60.9;71.0)	17.2 (13.2;22.2)	16.5 (12.3;21.8)
Female	2,948	51.4	55.3 (48.5;61.9)	16.5 (11.6;22.9)	28.2 (22.4;34.8)
Skin color					
White	2,203	46.1	65.6 (58.9;71.8)	16.6 (11.8;22.9)	17.8 (12.9;23.9)
Brown	2,491	40.5	55.4 (48.0;62.5)	19.8 (14.5;26.5)	24.8 (18.7;32.2)
Black	598	10.9	65.6 (53.4;76.0)	9.2 (5.1;16.2)	25.2 (16.8;35.9)
Yellow	104	1.9	35.0 (13.6;64.7)	4.6 (1.4;14.0)	60.4 (29.9;84.6)
Indigenous	49	0.6	24.0 (6.6;58.6)	13.6 (2.6;47.8)	62.4 (22.0;90.7)
Age (years)					
15	1,463	26.6	63.2 (53.9;71.6)	15.0 (9.8;22.3)	21.8 (15.2;30.2)
16	983	18.2	61.0 (49.3;71.6)	19.3 (11.7;30.0)	19.7 (12.3;30.0)
17	989	16.9	60.5 (50.5;69.5)	17.3 (11.5;25.2)	22.2 (14.6;32.3)
18	1,006	19.1	58.3 (48.3;67.7)	20.4 (14.1;28.6)	21.3 (13.9;31.2)
19	1,004	19.2	59.1 (50.2;67.5)	13.3 (9.0;19.1)	27.6 (20.2;36.5)
Household income (R\$)					
2,501.00 and over	673	12.3	68.6 (56.6;78.7)	20.8 (13.3;30.8)	10.6 (5.2;20.1)
501.00 - 2,500.00	3,586	71.5	69.0 (54.3;67.2)	17.4 (12.9;22.9)	21.6 (16.9;27.4)
Under 500.00	866	16.2	51.6 (41.9;61.1)	13.2 (8.6;19.8)	35.2 (26.3;45.2)
Schooling (years)					
8 or more	4,255	81.2	63.4 (58.3;68.1)	17.3 (13.8;21.6)	19.3 (15.2;24.2)
5 - 7	970	14.2	50.0 (40.8;59.3)	16.6 (11.8;22.8)	33.4 (24.6;43.4)
0 - 4	204	4.6	43.9 (27.3;62.0)	10.0 (4.5;20.6)	46.1 (30.4;62.6)
Untreated dental caries					
None	2,663	53.9	70.2 (63.8;75.9)	17.0 (12.7;22.3)	12.8 (9.4;17.2)
One to three	1,735	30.9	52.1 (44.6;59.5)	16.4 (10.9;23.9)	31.5 (24.4;39.6)
Four or more	969	15.2	43.3 (34.3;52.7)	17.8 (11.9;25.8)	38.9 (30.4;48.2)
Tooth loss					
None	4,265	82.6	63.5 (58.7;68.1)	17.1 (13.6;21.3)	19.4 (15.5;24.1)
One or more	1,102	17.4	46.2 (36.8;55.9)	16.2 (11.1;23.1)	37.6 (29.8;46.1)
Dental pain					
No	4,103	75.0	72.1 (67.2;76.5)	17.1 (13.5;21.5)	10.8 (7.8;14.4)
Yes	1,324	25.0	26.0 (18.7;34.9)	16.2 (11.2;22.9)	57.8 (49.2;66.0)
Malocclusion					
None	3,494	64.8	64.0 (58.1;69.4)	16.7 (12.9;21.4)	19.3 (14.7;24.9)
Defined	1,032	20.3	57.0 (45.6;67.6)	18.0 (10.8;28.4)	25.0 (17.1;35.1)
Severe	463	6.0	45.4 (27.6;64.5)	20.5 (11.4;34.0)	34.1 (23.1;47.2)
Very severe	456	8.9	55.0 (41.3;68.0)	12.8 (7.2;21.6)	32.2 (21.5;45.2)
Gingival bleeding					
No	3,518	65.9	66.8 (61.4;71.8)	14.8 (11.4;19.1)	18.4 (13.6;24.4)
Yes	1,927	34.1	48.6 (42.1;55.2)	20.8 (15.7;27.1)	30.6 (24.8;37.0)
Dental calculus					
No	3,221	63.9	65.1 (59.7;70.0)	14.7 (11.1;19.3)	20.2 (15.5;25.9)
Yes	2,224	36.1	52.8 (46.2;59.3)	20.6 (16.0;26.1)	26.6 (21.0;32.9)
Periodontal pockets					
No	4,871	90.0	62.0 (57.0;66.8)	16.9 (13.4;21.0)	21.1 (17.0;25.7)
Yes	574	10.0	47.8 (37.5;58.4)	16.5 (9.4;27.3)	35.7 (25.9;46.8)

OIDP: *Oral Impacts on Daily Performance*

RESULTS

A total of 5,445 adolescents aged 15 to 19 took part in the SBBrazil 2010 survey, with a response rate equal to 92.5%.

Table 1 shows the distribution of the sample and the OIDP in three categories, according to the independent variables studied. Slightly over half of the participants were female (51.4%), the majority self-reported as white (46.1%) or brown (40.5%) and the most frequent age was 15 (26.6%), with similar percentages for the remaining ages. The majority of the sample (71.5%) reported household income between R\$ 501.00 and R\$ 2,500.00, and approximately 80.0% had eight or more years of schooling. Regarding oral health disorders, slightly over half of the adolescents (53.4%) had no dental caries, while 15.2% had four or more untreated dental caries. At least 17.4% of the sample had lost one or more teeth due to dental caries and 25.0% reported having suffered from dental pain in the 6 months preceding the interview. Severe or very severe malocclusion was detected in 15.0% of the adolescents. When periodontal conditions were investigated, gingival bleeding after probing and dental calculus were observed in nearly 35.0% of the sample; and 10.0% of the adolescents presented periodontal pockets with four or more millimeters.

The prevalence of negative oral health impact was approximately 40.0%, and 22.5% of adolescents reported the presence of two or more negative impacts on their quality of life (Table 1). The prevalence of OIDP varied according to the investigated characteristics, being higher in females; those who were brown,

yellow skinned or indigenous when compared with individuals who reported white skin; among adolescents with lower household income and lower levels of schooling when compared with those with higher incomes and higher levels of schooling. In adolescents who had oral health problems, the prevalence of negative OIDP was also higher than in adolescents with no oral health disorders.

Figure 2 shows, in descending order, the frequency distribution of the nine items included in the OIDP index. The three most commonly reported negative impacts on quality of life were: difficulty in eating (20.9), discomfort when brushing teeth (16.1%) and anxiety or irritation due to dental disorders (14.7%). The less common negative impacts reported were difficulty in studying (4.7%) and those related to doing sport (4.4%).

Figure 3 shows the overall distribution of the OIDP by domain as well as according to the oral health conditions investigated, The domain with the most overall negative impact and also for the oral health conditions investigated, was the physical, followed by the psychological and the social domains. The highest prevalence of negative impact was found in adolescents who reported dental pain – 65.8%, 57.0% and 24.7% for the physical, psychological and social domains, respectively.

Table 2 shows results from crude and adjusted Poisson regression analysis. Regarding crude analysis, all of the variables except age were associated with higher OIDP scores and were included in the adjusted model. After adjusted analysis, all variables remained associated with the outcome with the exception of presence of

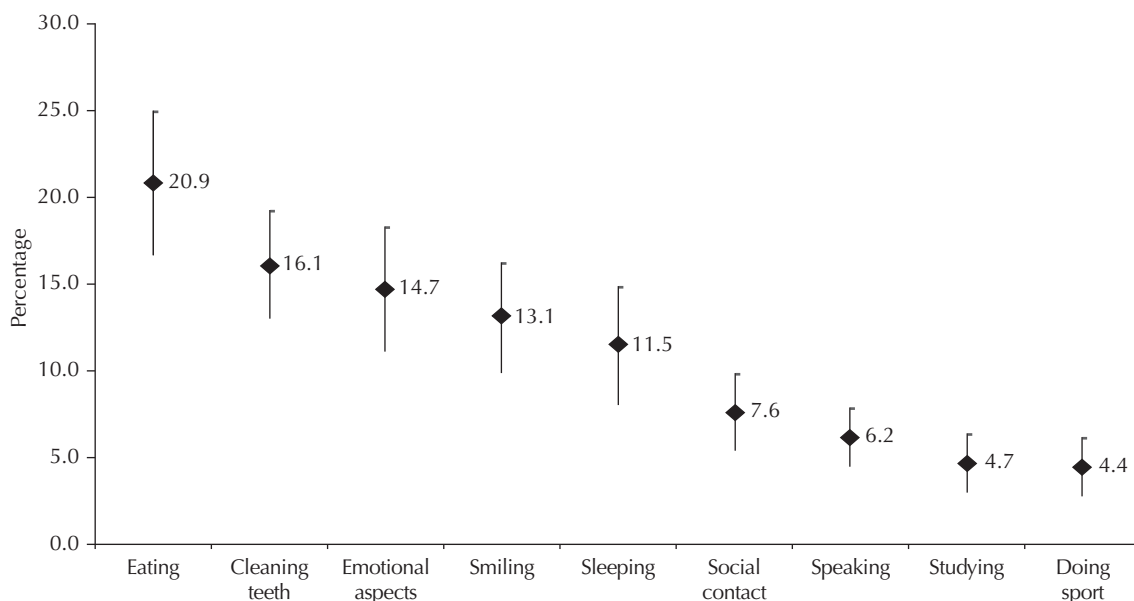


Figure 2. Prevalence of each oral impact on daily performances and respective 95% confidence intervals in Brazilian adolescents. SBBrazil 2010. (n = 5,445)

Table 2. Crude and adjusted Poisson regression models of the relationship between sociodemographic and dental status variables according to Oral Impacts on Daily Performance. SBBrazil 2010.

Variables	RM _b (95%CI)	p-value ^a	RM _a (95%CI)	p-value ^a
1st Block				
Sex		< 0.001		< 0.001
Male	1		1	
Female	1.55 (1.18;2.04)		1.52 (1.16;2.00)	
Skin color		< 0.001		< 0.001
White	1		1	
Brown	1.44 (1.02;2.02)		1.42 (1.01;1.99)	
Black	1.21 (0.78;1.90)		1.21 (0.77;1.90)	
Yellow	2.74 (1.49;5.07)		2.66 (1.40;5.07)	
Indigenous	3.53 (1.83;6.79)		3.32 (1.68;6.56)	
Age (years)		0.258		b
15	1		–	
16	1.09 (0.72;1.64)		–	
17	1.10 (0.77;1.58)		–	
18	1.11 (0.77;1.60)		–	
19	1.35 (0.96;1.89)		–	
2nd Block				
Household income (R\$)		< 0.001		0.014
2,501.00 and over	1		1	
From 501.00 to 2,500.00	1.69 (0.95;3.04)		1.51 (0.89;2.55)	
Under 500.00	2.41 (1.38;4.21)		1.84 (1.06;3.17)	
Schooling (years)		< 0.001		< 0.001
8 or more	1		1	
5 to 7	1.68 (1.24;2.27)		1.52 (1.13;2.05)	
0 to 4	2.48 (1.59;3.88)		2.11 (1.30;3.41)	
3rd Block				
Untreated dental caries		< 0.001		0.002
None	1		1	
One to three	2.18 (1.63;2.92)		1.36 (0.99;1.86)	
Four or more	3.16 (2.25;4.56)		1.53 (1.12;2.10)	
Tooth loss		< 0.001		< 0.001
None	1		1	
One or more	2.20 (1.7;2.83)		1.44 (1.16;1.80)	
Dental pain				< 0.001
No	1		1	
Yes	4.75 (3.84;5.88)		3.62 (2.93;4.46)	
Malocclusion		< 0.001		0.003
None	1		1	
Defined	1.20 (0.82;1.75)		1.13 (0.89;1.42)	
Severe	1.81 (1.16;2.83)		1.52 (1.04;2.23)	
Very severe	1.73 (1.22;2.44)		1.32 (1.01;1.72)	
Gingival bleeding		< 0.001		0.026
No	1		1	
Yes	1.69 (1.30;2.22)		1.20 (0.97;1.48)	
Dental calculus		< 0.011		b
No	1		–	
Yes	1.48 (1.16;1.89)		–	
Periodontal pockets		< 0.001		b
No	1		–	
Yes	1.67 (1.21;2.30)		–	

OIDP: *Oral Impacts on Daily Performance*RM_b: crude ratio of means; RM_a: adjusted ratio of means^a p-value – Wald test^b p-value higher than 0.2 in crude or adjusted analysis

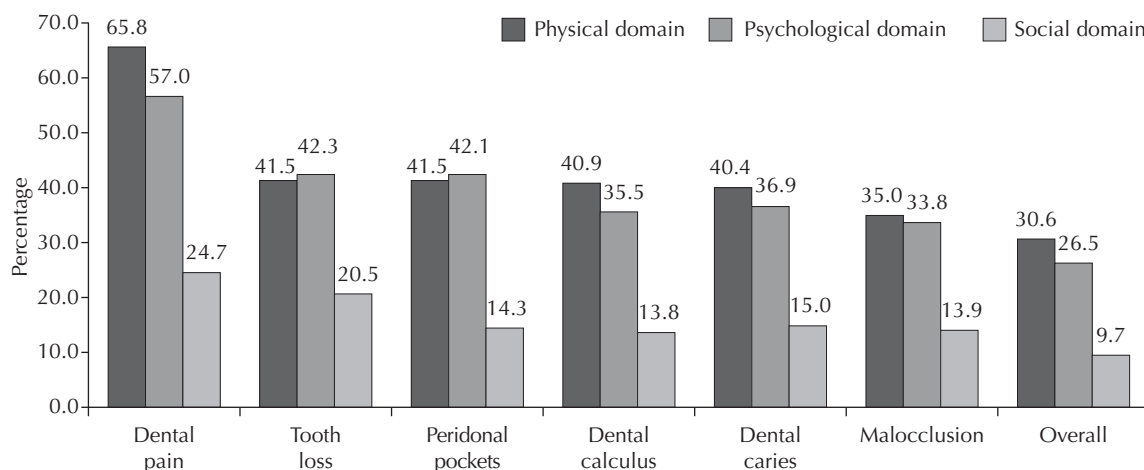


Figure 3. Prevalence of each oral health condition, according to each domain of Oral Impacts on Daily Performance and overall in Brazilian adolescents. SBBrazil 2010. (n = 5,445)

dental calculus and periodontal pockets (p -value > 0.2). Among variables in block 1, sex and race/skin color, showed a small change after the adjusted analysis – the mean OIDP score was 1.52 (95%CI 1.16;2.00) times higher in females than in males. The negative impact on quality of life was higher for *brown* (1.42, 95%CI 1.01;1.99), those with yellow skin (RM 2.66, 95%CI 1.40;5.07), and indigenous (RM 3.32, 95%CI 1.68;6.56) as compared to those with white skin. Variables in block 2, household income and schooling, showed a higher association with the outcome after the adjusted analysis: 1.84 (95%CI 1.06;3.17) for adolescents from lower income households and 2.11 (95%CI 1.30;3.41) for those with lower levels of schooling when compared with their respective reference categories. Oral health disorders in the third level of analysis, showed the highest impact on adolescents' quality of life among those with four or more teeth with untreated dental caries (RM 1.53, 95%CI 1.12;2.10), those with one or more missing teeth (RM 1.44, 95%CI 1.6;1.80), dental pain (RM 3.62, 95%CI 2.93;4.46) and those with severe (RM 1.52, 95%CI 1.04;2.23) or very severe malocclusion (RM 1.32, 95%CI 1.01;1.72).

DISCUSSION

In the 2010 Brazilian National Oral Health Survey (SBBrazil 2010), 39.4% of the adolescents aged 15-19 experienced at least one impact of oral conditions on quality of life. Females, those with black, brown, yellow skin and the indigenous, those with fewer years of schooling and who were economically disadvantaged, reported significantly poorer quality of life than those who were more socioeconomically advantaged, revealing a picture of social inequality. In addition, individuals with untreated dental caries, missing teeth, dental pain, malocclusion, and bleeding on probing

presented more impact on quality of life compared to those without these outcomes.

The SBBrazil 2010 was the first representative nationwide survey which included aspects of oral health-related quality of life of participants along with other self-reported and clinical oral health conditions. Moreover, the impact of oral health conditions on quality of life and the distribution of the impacts on adolescents are not well known. Studying the impact of oral health on quality of life in young people is particularly important. This age group is more sensitive to different impacts, such as, for instance, the perception of appearance and pain than adults. Oral conditions may affect not only adolescents' quality of life but also their psychological development and social interactions.⁸

Similar results regarding the prevalence of oral health impacts on quality of life in adolescents have been reported in other studies in Brazil.^{6,19} Yet, a higher prevalence was found in schoolchildren aged 11-12 years in Rio de Janeiro (88.7%),⁷ and in studies in other countries involving 12 year-old children in Sudan¹⁷(54.6%) and school children aged between 11 and 16 in Catanzaro, Italy (66.8%).⁵

The findings of this study are similar to others with regards the domains of oral health-related quality of life with more impacts. The physical domain, composed of items regarding difficulties eating and brushing teeth, the latter with a very similar pattern to those concerning feeling nervous or angry and feeling embarrassed when smiling were also the most affected daily tasks. Similar findings were observed in adolescents in Uganda,³ school children aged 11-12 in Rio de Janeiro (eating),⁷ adults in Thailand² and children in Sudan (eating and brushing teeth).¹⁷ Moreover, the epidemiological profile of oral health conditions may significantly influence the pattern of these impacts.

In this study, the most affected domains among individuals with dental pain, tooth loss and untreated dental caries were the physical and psychological ones, without significance between them. Around one-quarter of the adolescents reported dental pain, almost 20.0% had experienced tooth loss and almost half of them had untreated dental caries, revealing a population with a high prevalence of these health outcomes. Therefore, it is expected that the greatest impacts were difficulty in eating and brushing teeth, as well as irritability. In contrast, studies carried out in countries with low prevalence of oral health problems, the psychological domain, which is related to problems smiling, was one of the most prevalent.⁵

This study considered the adolescents' family income and schooling as a proxy measure of socioeconomic conditions. The lower the income and level of schooling, the more the impact of oral health on quality of life. Adolescents from low income families were also more likely to report difficulties in chewing and psychosocial problems in their daily life compared with those from high income families, after taking into account the presence of oral health problems such as dental caries, periodontal disease and tooth loss.¹⁴ This finding reinforces the results of this study regarding social inequalities in oral health. Studies on social inequality and non-normative oral health measures have increased in Brazil²¹ and internationally,²⁵ reinforcing the need to incorporate new approaches into this field of knowledge. Schooling is an important marker of social position. High levels of schooling is associated with better job opportunities, higher income and better housing which, in turn, have a positive influence on attitudes towards health, access to healthier food and use of oral hygiene products.¹⁵

This research also identified most of the health problems associated with the impact of oral health on quality of life in adolescents. Health conditions that related to a high level of suffering, such as toothache, stood out, which is a similar result to that obtained in another study.¹⁸ Clinical characteristics associated with aesthetics, such as severe malocclusion, also stood out. This finding was similar to other national^{19,21} and international studies.^{4,11}

Although the SBBrasil 2010 was a representative survey using appropriate methodology, further analyses based on the data are not exempt from limitations. The cross-sectional design implies that causality cannot be inferred from the associations found in this study. Methodological diversity, including the questionnaires used to assess quality of life, as well as the age groups studied, do not allow direct comparisons between this and other studies. The origin of the impacts and their magnitude may vary across populations with different cultural backgrounds both within and between countries.

Studies on the importance of the SBBrasil may significantly contribute to understanding the population's oral health problems in Brazil as they provide information to support the development of public policies. Moreover, regularly conducted representative national surveys such as SBBrasil, gathering detailed socioeconomic data, allow the expansion of strategies that consider the social gradient in the distribution of this phenomenon, in addition to preventive strategies and those related to monitoring and treatment of oral health problems that cause the most impact on quality of life. The distribution of inequalities should also be taken into account when planning the aforementioned strategies.

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