Implementation of the School Health Program: relationship with aspects of students' oral health

Implementação do Programa Saúde na Escola: relação com aspectos da saúde bucal dos estudantes

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ABSTRACT This study aimed to investigate the association between the School Health Program (PSE) implementation and aspects related to the oral health of adolescent students attending public schools in Brazil. An exploratory cross-sectional study was conducted using data from the 2015 National School Health Survey (PeNSE) in a sample of 81,154 students aged 13 to 15 in the capitals, Federal District, and inland cities. Data were retrieved from questionnaires answered by students and those responsible for the schools. We performed a bivariate analysis of the association between the variable 'implementation of PSE actions by the school' (Yes/No) and aspects related to the students' oral health. Compared to schools without PSE implementation, those that had implemented the Program had better behavioral indicators (consumption of sugar-added foods, cigarettes, and alcohol); selling healthy or sugar-added foods; availability of a health group/committee, and actions of the More Education Program and with Primary Health Care Units ($p<0.05$). We concluded that there was an association between the implementation of the PSE and more favorable aspects related to oral health regarding the students' diet, tobacco use, and alcohol consumption, and school health and education actions.

KEYWORDS Adolescent health. Oral health. Health surveys. School health services.

RESUMO *O estudo objetivou investigar a associação entre a implementação do Programa Saúde na Escola (PSE) e aspectos relacionados com a saúde bucal de adolescentes escolares que frequentam escolas públicas no Brasil. Foi realizado estudo transversal exploratório utilizando dados da Pesquisa Nacional de Saúde Escolar (PeNSE) 2015 em uma amostra de 81.154 estudantes de 13 a 15 anos frequentando escolas públicas das capitais, Distrito Federal e interior. Os dados foram obtidos por meio de questionários respondidos pelos alunos e responsáveis pelas escolas. Foi realizada análise bivariada de associação entre a variável 'implementação das ações do PSE pela escola' (Sim/Não) e aspectos relativos à saúde bucal dos estudantes. Em comparação com escolas sem implementação do PSE, as que haviam implementado o Programa apresentavam melhores indicadores de comportamento (consumo de alimentos com açúcar adicionado, cigarro e álcool); venda de alimentos saudáveis ou com açúcar adicionado; existência de grupo/comitê de saúde, ações do Programa Mais Educação e ações em conjunto com a Unidade Básica de Saúde ($p<0,05$). Concluiu-se que houve associação entre a implementação do PSE e aspectos mais favoráveis relacionados com a saúde bucal, referentes a alimentação, uso de cigarro e álcool entre os escolares, e ações de saúde e educação nas escolas.*

PALAVRAS-CHAVE *Saúde do adolescente. Saúde bucal. Inquéritos epidemiológicos. Serviços de saúde escolar.*

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Introduction

The School Health Program (PSE) is an intersectoral policy within the Ministries of Education and Health, established by Presidential Decree nº 6.286 of December 5, 2007[1]. The PSE contributes to the comprehensive education of students in the public primary education network through prevention, promotion, and health care actions, which must be developed jointly with the primary public education network and per the principles and guidelines of the Brazilian Unified Health System (SUS).

The oral health actions proposed in the decree mentioned above are 'assessment of oral health and hygiene', which were later detailed in the publication 'Thematic notebook of the School Health Program: oral health'[2]: a survey of the most prevalent oral diseases and treatment needs, health education, promotion of healthy school meals, supervised oral hygiene, and topical application of fluoride. The oral health teams (dental surgeon and oral health technician or oral health assistant) are responsible for developing technical actions linked to the assessment of students' oral health, where the direct participation of the entire school community is essential, along with other professionals from the health teams working in the shared territory, to identify needs and develop group activities at school[2].

The PSE guidelines include monitoring and evaluating activities and reorienting interventions. Scientific studies can support this process; however, only some have investigated the effectiveness or impact of school actions over the years[3,4]. Published studies on oral health in the PSE are scarce and based on surveys of students' dental needs and experience reports in small samples of schools in two municipalities of the Northeast region[5,6]. While these descriptive studies may affect the planning and evaluation of the program at the local level, they do not highlight the influence of the PSE on aspects related to the oral health of schoolchildren.

The PSE is based on the principle of comprehensiveness, considering health and education as part of a broad training for citizenship and the full enjoyment of human rights, strengthening the confrontation of vulnerabilities that may compromise the entire development of the student. In this sense, school health-related management practices stand out, which point to a robust process of promoting students' quality of life, such as school health committees; joint actions with the PHC Units (UBS) of reference in the school's territory; and the Mais Educação[7] (More Education) Program, a federal government strategy to induce the expansion of school hours and curricular organization, from the perspective of Full-Time Education.

Another government initiative focused on the health of schoolchildren in the first decade of the 2000s is the National School Health Survey (PeNSE), which aims to organize the monitoring of schoolchildren's health and offer information for planning public policies. The Brazilian Institute of Geography and Statistics (IBGE) and the Ministry of Health, with the support of the Ministry of Education, have held four editions of PeNSE[8] since 2009, which makes up the surveillance system for risk factors and protection of Chronic Noncommunicable Diseases (NCDs) in Brazil.

Using data from PeNSE 2015, the previous studies[9,10] showed that the potential for promoting oral health in schools in Brazilian capital cities was associated with contextual factors in schools, capitals, and Brazilian regions[9]. Schools with more significant potential to contribute to the oral health of schoolchildren had a higher prevalence of more favorable behaviors – annual visits to the dentist, weekly consumption of soft drinks and sugary sweets, daily brushing frequency, and cigarette experimentation[10]. However, the effect of implementing the PSE was not analyzed in isolation but as a component of the 'oral health-promoting school environment' proposed in these studies. Furthermore, dental pain and other school context variables

with possible effects on oral health were not analyzed as outcomes. Their inclusion may broaden the understanding of the program's effect.

Other studies in Brazilian locations corroborate the benefits of oral health promotion actions in schools. The results revealed better oral health conditions – lower rates of caries[11], dental trauma[12], and periodontal condition[13] – in adolescents from schools that develop these actions. The effect of health promotion can generate lower costs for the health system, as it reduces the need for dental treatment[14], and must be monitored on an ongoing basis.

Despite the evidence of the effectiveness of school-based programs in promoting the oral health of schoolchildren[15,16], studies in national and local contexts are required to assess intrinsic issues, such as the implementation of the PSE in Brazilian schools. Based on the available evidence, students from schools implementing PSE are expected to have lower dental pain prevalence and more positive oral health-related behaviors than those not developing PSE. Moreover, we expect a higher prevalence of environment and school management variables with possible positive effects on the oral health of students who attend schools with PSE as a reflection of the actions developed by the program teams. The results of this study are based on a national health survey in a comprehensive and representative sample of adolescents in the country and can support the evaluation of the PSE, indicating whether the actions developed impacted the oral health of schoolchildren during the period studied. This study aimed to investigate the association between the presence/implementation of the PSE and aspects related to the oral health of schoolchildren attending Brazilian public schools.

Material and methods

This cross-sectional study using data from the 2015 PeNSE available on the IBGE website was conducted by the Ministry of Health and IBGE. Data from the most recent PeNSE conducted in 2019 were unavailable until this analysis. All data were obtained through self-administered electronic questionnaires in the schools, answered by students and those responsible for the institutions. PeNSE 2015 was approved by the National Research Ethics Council (nº 1.006.467/2015).

This complex cluster sampling comprised 102,072 ninth-graders from 3,040 public (federal, state, and municipal) and private schools in the 27 Brazilian capitals and the inland cities (Sample 1 of PeNSE). Most students (88.6%) were between 13 and 15 years old. More details about PeNSE 2015 can be found in a previous publication[17].

In the present analysis, only data referring to students attending public schools, which are the target audience of the PSE, were used. With the exclusion of cases with missing data ('I don't know' or 'did not respond' answers) from the variables selected for the present analysis, the final sample consisted of 81,154 students from 2,424 public schools in the capitals, Federal District (DF), and inland municipalities.

The variable 'implementation of PSE actions by the school' (Yes/No) was obtained through the following question in the PeNSE questionnaire: 'Does the school implement actions of the School Health Program (PSE)?'. The other variables were organized into four blocks, the first referring to the schools' characteristics. For the other blocks, variables from schools and students with the potential to directly or indirectly influence oral health were selected based on previous studies: a) student behaviors related to oral health and self-perceived oral health (dental pain in the six months before the survey); b) oral health-related school environment; and c) health-related school management practices.

The following behaviors related to oral health were dichotomized for the present analysis, according to a previous study[10]: daily brushing frequency 30 days before the

survey (< twice / ≥ twice); annual visit to the dentist (< once / ≥ once); weekly consumption of sugary foods – candies/goodies and soft drinks (low: ≤ 4 days / high: ≥ 5 days); and daily consumption of soft drinks (low: ≤ twice / high: ≥ 3 times). In the other variables, the original dichotomous categories of the PeNSE questionnaire were maintained: yes/no.

The school environment's oral health-related variables were the presence of a canteen; offer and sale of foods and beverages with cariogenic potential due to added sugar or healthy foods (without added sugar); toilets and sinks in good conditions, which can be used in oral hygiene; ban of alcoholic beverages and tobacco. The availability of records on the health of schoolchildren and first aid materials/medicines, the presence of a health group/committee, the Mais Educação Program, and joint actions with the UBS, indicate comprehensive health care for students at school, which may reflect on general and oral health. Data were analyzed using the Statistical Package for the Social Sciences® (SPSS) program for Windows® (version 20), using descriptive and analytical procedures with an exploratory approach, considering complex sampling. The frequency distribution of the variables was initially estimated. Except for 'geographical region', all variables with more than one response category were dichotomized to facilitate data analysis and interpretation. Cases with 'I don't know' response categories were excluded.

Then, a bivariate association analysis was performed between the variable 'implementation of PSE actions by the school' and each of the oral health-related variables, using Pearson's chi-square test with Rao-Scott correction and a 5% significance level. The Rao-Scott test clarifies whether the distribution of the implementation of PSE actions, according to the other variables studied, is random or if there is a pattern determined by dependence between these variables. Standardized residuals were analyzed for the association between pairs of categories of the selected variables, which facilitated the comparison of the typical patterns of each category. Residuals (standardized difference between observed and expected counts) resulted in excess or lack of occurrence, with values with a positive excess count greater than 1.96 being recognized, with a one-tailed significance level of 2.5%, because it is only from the observation of excesses.

Results

The distribution of the variable 'Implementation of the School Health Program (PSE) actions', per the characteristics of the institutions, is shown in *table 1*. Among the country's geographic regions, the Northeast stands out for the highest proportion of schools that implement PSE actions, representing more than a third (38.41%) of the total. The Midwest region had the lowest proportion (8.92%). Most schools implementing the Program were located in capital cities (77.76%) and urban areas (87.35%). Few schools operated on a full-time education and boarding basis, and this finding was more frequent in schools with the PSE.

Table 1. Implementation of actions of the School Health Program by public schools, according to the characteristics of the institutions. National School Health Survey, 2015

Schools characteristics		School implements PSE actions		
		Yes (%)	No (%)	P-value**
Geographic region	North	11.56	9.23	0.000
	Northeast	38.41*	19.22	
	Southeast	31.74	50.58*	
	South	9.37	14.75*	
	Midwest	8.92*	6.22	
	Total	**100.00**	**100.00**	
Municipality type	Capital	77.76*	82.44	0.040
	Non capital	22.24	17.56*	
	Total	**100.00**	**100.00**	
School location	Rural	12.65*	7.47	0.001
	Urban	87.35	92.53*	
	Total	**100.00**	**100.00**	
Full-time education	Yes	23.27 *	21.32	0.031
	No	76.73	78.68 *	
	Total	**100.00**	**100.00**	
Boarding school	Yes	4.23	4.43	0.527
	No	95.77	95.57	
	Total	**100.00**	**100.00**	

Source: Own elaboration.

*The residual analysis revealed a clear discrepancy between the observed and expected frequencies of the variables. Therefore, the null hypothesis was rejected and the hypothesis of dependence of the variables with an association was accepted.

**Rao-Scott test.

As for the variables related to the students' oral health, there was a predominance of more favorable conditions in schools with PSE implementation. Five of the seven oral health-related behaviors (*table 2*) were more frequent in this group of schools: low weekly consumption of candies/goodies; low weekly consumption of soft drinks; low daily consumption of soft drinks; no experience of cigarette and alcohol consumption ($p<0.05$). The proportion of students reporting dental pain in the six months before the survey was low, and there were no significant differences between the two school groups. The variables 'toothbrushing frequency' and 'annual visit to the dentist' were also not associated with PSE (*table 2*).

Table 2. Association between implementation of actions of the School Health Program by public schools and individual variables related to students' oral health. National School Health Survey, 2015

		School implements PSE actions		
Individual variables related to students' oral health		**Yes (%)**	**No (%)**	**P-value****
Oral health behaviors				
Daily toothbrushing frequency	< twice	6.90	7.15	0.463
	≥ twice	93.10	92.85	
	Total	**100.00**	**100.00**	
Annual visit to the dentist	< once	32.90	31.86	0.173
	≥ once	67.10	68.14	
	Total	**100.00**	**100.00**	
Weekly consumption of candies/goodies	High (≥ 5 days)	40.12	42.73 *	0.001
	Low (≤ 4 days)	59.88 *	57.27	
	Total	**100.00**	**100.00**	
Weekly consumption of soft drinks	High (≥ 5 days)	24.65	27.92 *	0.000
	Low (≤ 4 days)	75.35 *	72.08	
	Total	**100.00**	**100.00**	
Daily consumption of soft drinks	High (≥ 3 times)	29.52	33.50 *	0.000
	Low (≤ twice)	70.48 *	66.50	
	Total	**100.00**	**100.00**	
Cigarette smoking experience	Yes	17.92	20.47 *	0.000
	No	82.08 *	79.53	
	Total	**100.00**	**100.00**	
Alcohol consumption experience	Yes	52.22	54.79 *	0.005
	No	47.78 *	45.21	
	Total	**100.00**	**100.00**	
Self-perceived oral health				
Dental pain experience	Yes	24.63	24.40	0.705
	No	75.37	75.60	
	Total	**100.00**	**100.00**	

Source: Own elaboration.

*The residual analysis revealed a clear discrepancy between the observed and expected frequencies of the variables. Therefore, the null hypothesis was rejected and the hypothesis of dependence of the variables with an association was accepted.

**Rao-Scott test.

More favorable situations regarding the oral health-related school environment were found in most schools (*table 3*). The presence of a canteen and the sale of soft drinks, sugary drinks, and cookies/biscuits in the canteen were lower in PSE-implementing schools than in schools without PSE ($p<0.05$). Schools with the PSE also had a higher proportion of fruit salad sales in the canteen and the presence of alternative outlets, with a lower proportion of a ban on alcohol consumption ($p<0.05$).

Table 3. Association between the implementation of actions of the School Health Program by public schools and aspects of the school environment related to oral health. National School Health Survey, 2015

School environment related to oral health		School implements PSE actions		
		Yes (%)	No (%)	P-value**
Offers snack/lunch	Yes	98.89 *	97.05	0.097
	No	1.11	2.95 *	
	Total	**100.00**	**100.00**	
Has canteen	Yes	24.98	39.04 *	0.000
	No	75.02 *	60.96	
	Total	**100.00**	**100.00**	
Sells soft drinks in the canteen	Yes	8.81	14.86 *	0.035
	No	91.19 *	85.14	
	Total	**100.00**	**100.00**	
Sells juice in the canteen	Yes	67.14	74.39	0.344
	No	32.86	25.61	
	Total	**100.00**	**100.00**	
Sells sugary drinks in the canteen	Yes	4.98	11.79 *	0.017
	No	95.02 *	88.21	
	Total	**100.00**	**100.00**	
Sells cookies/biscuits in the canteen	Yes	6.33	13.51 *	0.001
	No	93.67 *	86.49	
	Total	**100.00**	**100.00**	
Sells candies/goodies in the canteen	Yes	8.12	10.92	0.270
	No	91.88	89.08	
	Total	**100.00**	**100.00**	
Sells fresh fruit/fruit salad in the canteen	Yes	15.34 *	5.48	0.013
	No	84.66	94.52 *	
	Total	**100.00**	**100.00**	
Has alternative sales outlets***	Yes	36.64 *	25.64	0.001
	No	63.36	74.36 *	
	Total	**100.00**	**100.00**	
Sells soft drinks at alternative outlets***	Yes	22.21	19.13	0.276
	No	77.79	80.87	
	Total	**100.00**	**100.00**	
Sells juice at alternative outlets***	Yes	44.45	43.76	0.910
	No	55.55	56.24	
	Total	**100.00**	**100.00**	
Sells sugary drinks at alternative outlets***	Yes	11.44	12.89	0.527
	No	88.56	87.11	
	Total	**100.00**	**100.00**	
Sells cookies/biscuits at alternative outlets***	Yes	12.31	10.91	0.520
	No	87.69	89.09	
	Total	**100.00**	**100.0**	

Table 3. (cont.)

School environment related to oral health		School implements PSE actions		
		Yes (%)	**No (%)**	**P-value****
Sells candies/goodies at alternative outlets ***	Yes	20.68	15.58	0.049
	No	79.32	84.42	
	Total	**100.00**	**100.00**	
Sells fresh fruit/fruit salad at alternative outlets***	Yes	9.12	4.88	0.133
	No	90.88	95.12	
	Total	**100.00**	**100.00**	
Has a vegetable garden	Yes	29.11	26.18	0.399
	No	70.89	73.82	
	Total	**100.00**	**100.00**	
Has a bathroom in good condition	Yes	97.11	96.31	0.376
	No	2.89	3.69	
	Total	**100.00**	**100.00**	
Has a sink in good condition	Yes	95.44	95.54	0.919
	No	4.56	4.46	
	Total	**100.00**	**100.00**	
Has records on the health of schoolchildren	Yes	61.32	55.89	0.146
	No	38.68	44.11	
	Total	**100.00**	**100.00**	
Have first aid materials/medicines	Yes	46.35	47.70	0.725
	No	53.65	52.30	
	Total	**100.00**	**100.00**	
Prohibits tobacco consumption	Yes	86.46	89.90	0.119
	No	13.54	10.10	
	Total	**100.00**	**100.00**	
Prohibits consumption of alcoholic beverages	Yes	88.04	92.34 *	0.017
	No	11.96 *	7.66	
	Total	**100.00**	**100.00**	

Source: Own elaboration.

*The residual analysis revealed a clear discrepancy between the observed and expected frequencies of the variables. Therefore, the null hypothesis was rejected and the hypothesis of dependence of the variables with an association was accepted.

**Rao-Scott test.

***Alternative outlets are food outlets inside or at the entrance to the school, besides the canteen (e.g., street vendor/cart).

All health-related school management practices investigated were associated with implementing PSE in schools. A health group/committee, actions of the Mais Educação Program, and joint actions with UBS were more prevalent in the schools that had implemented the program (*table 4*).

Table 4. Association between the implementation of actions of the School Health Program by public schools and school management health-related practices. National School Health Survey, 2015

School management health-related practices		School implements PSE actions		
		Yes (%)	No (%)	P-value**
Has a health group/committee	Yes	56,26 *	20,27	0,000
	No	43,74	79,73 *	
	Total	**100,00**	**100,00**	
Performs *Mais Educação* (More Education) Program actions	Yes	77,43 *	63,26	0,000
	No	22,57	36,74 *	
	Total	**100,00**	**100,00**	
Performs actions jointly with the PHC Unit	Yes	91,37 *	61,96	0,000
	No	8,63	38,04 *	
	Total	**100,00**	**100,00**	

Source: Own elaboration.

*The residual analysis revealed a clear discrepancy between the observed and expected frequencies of the variables. Therefore, the null hypothesis was rejected and the hypothesis of dependence of the variables with an association was accepted.

**Rao-Scott test.

Discussion

The present study showed that the implementation of PSE in Brazilian public schools is associated with several individual factors and the school environment with a potential protective effect on the oral health of adolescent students, such as lower sales and consumption of sugary foods and beverages and fewer cigarettes and alcohol experimentation. Considering that there are no reports in the literature on the PSE's effectiveness in promoting students' oral health, the findings overly contribute to the search for evidence. They also reinforce that school health promotion actions are an opportunity to promote oral health[18].

Although the methodology of the present study does not allow for establishing causal relationships, the associations indicate that the program's actions contribute to developing or reinforcing healthy lifestyles and self-care practices among students while influencing the development of actions in schools that establish healthy environments and the adoption of individual measures by the school community, which can contribute to preventing NCDs. The importance of actions in the school environment was addressed in a review study, showing that oral health promotion interventions in Brazilian schools have focused on individual changes, particularly in oral hygiene[19]. The results of the present study support theoretical-practical reflections to produce dialogues and qualified actions sensitive to the need for renewing health care.

The lack of association between PSE and the health behaviors more directly related to the students' oral health is noteworthy: daily toothbrushing frequency and annual frequency of dental visits. In a previous study using data from PeNSE 2015 only in the capitals, these behaviors were associated with the indicator of potential support to promoting oral health in schools, which included the implementation of the PSE and other school factors[10]. The relationship between oral health education actions at school and greater frequency of toothbrushing has been demonstrated in other contexts[20].

Another aspect to consider is that the program's likely effects on food choices and cigarette and alcohol use, which are common

risk factors for other chronic diseases[21,22], may result from the actions of primary care teams, which do not always include oral health teams. As the Ministry of Health recommended in the PSE, topics related to oral health should be addressed, emphasizing health promotion and care and the prevention of diseases and illnesses based on intersectoral work centered on shared and co-accountable actions[2]. These findings have implications for the PSE, showing the need for greater attention to educational actions on topics related more specifically to oral health and oral hygiene in schools, which are independent of dentists or other members of the oral health teams. While the oral health team is responsible for supervising these actions, the other professionals should be instructed on the correct practice of oral hygiene as a component of body hygiene.

Dental pain, an important indicator of caries in childhood and adolescence, was also not associated with implementing PSE in schools (p=0.705). The seven-year interval between the two surveys, from 2008 (when the schools implemented the program) to 2015 (the year of the PeNSE), may have needed to be increased to observe the effects on the dental condition. Thus, the risk of bias regarding the temporal sequence in the relationship between PSE in schools and the prevalence of dental pain among students must be considered, as the causal inference between cross-sectional studies is impossible. Furthermore, the healthy behaviors observed more frequently in schools with PSE may not be sufficient to lead to a lower prevalence of dental caries and pain, considering other broader individual and social conditions[23].

Using national health survey data affects the design and interpretation of data from secondary analyses such as the present study. PeNSE provides a limited number of variables on oral health and no clinical indicators of oral health status, such as caries and periodontal status. Furthermore, it does not explore other PSE-related issues besides its implementation or not by schools. There needs to be data on the frequency with which PSE actions, particularly oral health actions, are implemented in educational institutions. Nevertheless, PeNSE provides nationally representative data obtained with methodological rigor by recognized government institutions, enabling more consistent results that are less subject to bias.

The association between PSE at school and all school health-related management practices investigated are positive in the context of intersectoral actions recommended by the Program[1,2], aligned with the health promotion principles[24,25]. The relationship with the health group/committee, actions of the Mais Educação Program, and joint actions with UBS reveal that schools that implemented the PSE were also more open to other government initiatives that can benefit the comprehensive health of students. The lack of integration between the health and education sectors in health promotion actions in Brazilian schools was pointed out in a review study[26]. Work with the UBS was expected, considering that the PSE actions are the responsibility of the teams of these units within the PHC of the SUS[2].

An unexpected result was the lower proportion of schools with a ban on alcohol consumption in the group with PSE implementation (88.04%) compared to schools without PSE (92.34%). This issue should be further investigated to elucidate whether the negative response by those responsible for the schools that implemented the program indicates the institution's lack of concern with alcohol consumption or the perceived lack of this measure.

Based on bivariate analyses, the results of the present study raise questions and hypotheses to be analyzed in future studies, considering other variables and statistical models that explain the complex relationships between the factors investigated. Longitudinal studies are recommended to reveal the possible effects of the program's actions on students' oral health and the influence on related behaviors, considering broader covariates. The evaluation of specific oral health actions provided for in the PSE

(health education, supervised oral hygiene, and topical application of fluoride), not included in the PeNSE, can highlight the program's effectiveness in students' oral health.

Considering that it is a public health policy, monitoring the actions performed by the PSE must occur systematically and continuously, allowing the necessary adjustments and the achievement of the expected results for the school community. There is still a need to expand and strengthen the program's performance in inland municipalities and rural areas.

Conclusions

There was an association between the implementation of the PSE and more favorable aspects related to oral health in schools. The results show the association between the implementation of the PSE and the most favorable aspects of oral health, including diet, cigarette and alcohol use among schoolchildren, and school health and education actions. However, the lack of association with aspects directly related to oral health (dental pain, daily brushing frequency, and annual visit to the dentist) point to persistent PSE weaknesses. Thus, the results can contribute to evaluating the effect of PSE actions on the oral health of public school students.

Collaborators

Moreira RS (0000-0003-0079-2901)* contributed to the study's design; data analysis and interpretation for the work; critical review of the manuscript; and final approval of the version to be published. Mauricio HA (0000-0002-6645-457X)* contributed to the study's design; data analysis and interpretation for the work; the writing of the manuscript; and final approval of the version to be published. Jordão LMR (0000-0001-7230-9398)* and Freire MCM (0000-0001-6078-6728)* contributed to the study's design; data interpretation for the work; the writing of the manuscript; and final approval of the version to be published. ■

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