Oral health condition in schoolchildren in a Brazilian city

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Abstract

With epidemiological studies, it is possible to describe the health reality of a population, in addition to relating it to socioeconomic and demographic factors. On that way, it is possible to undertake health intervention planning, favoring more effective management. Thus, this study aims to describe the oral health condition of school-age children in the municipality of Palmas, in the state of Tocantins, Brazil. For this purpose, it was used methodologies proposed by the indices of oral health qualification such as the Decayed, Missing, and Filled Teeth Index in the permanent and deciduous dentition (DMF-T and dfm-t, respectively) and the Simplified Oral Hygiene Index (OIH-S). Furthermore, the questionnaire of the SB Brasil 2010 Project was used to analyze the social condition of the evaluated individuals. Thus, this work shows the partial result of the oral health condition of 1,028 schoolchildren aged from 5 to 12 years evaluated in 9 schools up to the present moment. By school, the mean DMF-T index ranged from 0,43 to 1,86, and it can be highlighted that all of these are shown to be below the National average, according to data described by the National Oral Health Survey of 2010. Nevertheless, it is described that 65% of the children evaluated presented the result of the OHI-S reported as poor/bad. Therefore, based on the description of the conditions found in this study, we observe the need for more interventional measures to prevent oral health problems in schools.

Keywords: Oral Health; Epidemiology; Child; DMF Index; Oral Hygiene Index; Public Health

Abbreviations

CEULP: Centro Universitário Luterano de Palmas; CNPq: National Council for Scientific and Technological Development; DMF-T: Decayed, Missing and Filled Teeth; IBGE: Brazilian Institute of Geography and Statistics; OHI-S: Simplified Oral Hygiene Index; SPSS: Statistical Package for the Social Sciences; ULBRA: Universidade Luterana do Brasil; WHO: World Health Organization.

Introduction

Some studies [1] points out that countries that follows the oral health program proposed by the World Health Organization (WHO), periodically carry out epidemiological surveys to be assessed the average of decayed teeth found per person in the country, as well as the characterization of the prevalence of other oral pathologies. Thus, it is possible to assess the effectiveness of government programs in oral health prevention and aid in the planning of interventions in health.

In this sense, some works [2,3] have shown that caries and periodontal diseases affect a large part of the population. In this perspective, it is estimated that 60 to 90 percent of school-age children and almost all the adults around the world are affected by these diseases. It is indicated that untreated decayed teeth represent the most prevalent not transmissible chronic disease in humans, affecting 35% of the world's population [4,5].

This disease has risk factors as the absence of fluoridated water accessible, diet, socio-economic, demographic and cultural factors, living in places away from an urban area, in addition to biological factors such as the insistent presence of dental biofilm, related to oral hygiene habits of the individual [2,3].

In a preventive analysis, it is described that school children become an accessible population when compared to other study groups, increasing the possibility of changing health habits [6]. Thus, it is said that oral health education must be considered a pillar population health care.

This becomes evident in Brazil from the data of the oral health epidemiological survey last conducted in 2010 by the National Survey of Oral Health (SB Brasil 2010 Project). This study indicated that caries affects 43% of individuals from 5 years of age evaluated and 56% of those with 12 years [3,7].

In this perspective, is enhanced the performance of epidemiological studies, which help the municipalities on the theme of public administration in health, since some studies indicates that there are problems in the allocation of resources in areas with a significant need for clinical intervention by the absence of more detailed descriptions of the local situation [1].

Thus, the justification of this study can be punctuated through the reality of the lack of current investigations describing the oral health situation of schoolchildren from public schools in the city of Palmas, located in the state of Tocantins, Brazil. Therefore, through indexes validated by the WHO, this study intends to describe the oral health situation of this population, generating results that can promote local actions in the prevention of dental health.

Materials and Methods

This study is an analysis of the partial results of a cross-sectional work aimed at describing the oral health situation of the schoolchildren in the city of Palmas, generating results that can lead to intervention actions in the reality found. Therefore, seeking to fulfill this objective, this study was approved by the Research Ethics Committee of CEULP/ULBRA by the opinion number 1.256.951.

To this end, there was a universe with the students enrolled in municipal public schools and daycare centers in the municipality of Palmas, in the years from 2015 to 2020. The systematic sample with an error of 5%, considering the total number of students enrolled in the age group of 5 and 12 years, will total 355 children in preschool II, distributed in 39 daycare centers and 350 pupils of the seventh grade, distributed in 28 municipalities.

For data collection, evaluation forms validated by the SB Brasil 2010 Project were used for the diagnosis by applying the indices of quantification of Decayed, Missing and Filled Teeth in the permanent and deciduous dentition (DMF-T and dmf-t

Indexes, respectively) and Simplified Oral Hygiene Index (OHI-S). Using, one more time, the national oral epidemiology project, their questionnaire was used for the socio-economic and demographic characterization of the population of this study [8].

From the point of view of the OHI-S, the buccal surfaces of elements 11, 16, 26 and 31 and the lingual faces of teeth 36 and 46 were stained with a dental plaque indicator (Eviplac®). Thus, according to the number of stained faces, each tooth received a classification in score, being considered "0" a surface without plaque; "1" for 1/3 of surface covered per plaque; "2" for more than half of the surface covered with plaque and "3" for the entire dental surface covered by plaque. After completing this evaluation, the scores of all the teeth were added and the values of this sum (Σ) were classified as excellent (Σ = 0), good (Σ = from 1 to 6), bad (Σ = from 7 to 11) or poor (Σ = from 12 to 18).

After the application of the indexes in the study population, the data were scanned and stored in a spreadsheet of the Microsoft Office Excel Program version 2016 (Microsoft Corp., Redmond, WA, USA). Subsequently, this same program was used for the elaboration of descriptive statistical analyses and elaboration of graphs and tables demonstrating these results.

Results and Discussion

In this study, a population of 1.028 individuals, aged from 5 to 12 years, enrolled in 9 different schools located in the city of Palmas was analyzed. In this sense, (table 1) illustrates the main socioeconomic and demographic characteristics collected from these people.

Variables	FrequencyN (%)
Sex	
Male	507 (49,32)
Female	520 (50,58)
Information not collected	1 (0,1)
Age	
5	22 (2,14)
6	143 (13,91)
7	126 (12,26)
8	144 (14,01)
9	247 (24,03)
10	267 (25,97)
11	23 (2,24)
12	46 (4,47)

Information not collected	10 (0,97)
Ethnicity	
Yellow	266 (25,8)
White	227 (26,4)
Black	193 (22,8)
Brown	272 (18,7)
Indigenous	0 (0)
Information not collected	70 (6,8)
Income	
100-399	11 (8,03)
400-899	33 (24,09)
900-1099	34 (24,82)
1100-1999	31 (22,63)
2000-4399	14 (10,22)
8012-9055	2 (1,46)
Information not collected	12 (8,76)
Number of people in the residence	
1 a 2	72 (52,55)
3 a 4	64 (46,72)
5 a 6	1 (0,73)
Information not collected	0 (0)
Number of goods in the residence	
5 a 8	61 (44,53)
9 a 14	15 (10,95)
15 a 18	2 (1,46)
45	1 (0,73)
Information not collected	12 (8,76)

Table 1: Socio-demographic and economic data of the population assessed.

From this view, (table 2) and 3 bring with them a dental view of the patients, where the first analysis refers to the recognition of the way the dentist's service is accessed. Meanwhile, in table 3, the individual was questioned about his self-perception in oral health, in order to indicate degrees of satisfaction from the perception of some pain in the oral region and which would have been, on a scale, the intensity of this pain.

In this way, in the present study, there was proportionality in the sex variable, as the data displayed in table 2. In addition, in the same table, was observed a greater predominance of schoolchildren aged 9 to 10 years, often affected by caries [9]. So it is important to take into account the age of the children to be evaluated, since

increasing age may indicate a greater chance of developing primary caries, especially in mixed dentition phase (which are included in this study), as among the ages of 6 to 12 years where there is a high risk of caries incidence due to sensitive gums, crowding of the teeth and difficulty of cleaning, linked to behavioral factors in children [9].

Variables	**Frequency N (%)**
Have You ever been to the dentist before?	
Yes	118 (86)
No	11 (8)
Do Not know/did not answer	2 (1)
Information not collected	6 (4)
Where was the last consult with the dentist?	
Public Service	85 (62)
Private Service	23 (17)
Health Plan or Covenants	6 (4)
Other	2 (1)
It was Never	5 (4)
Do Not know/did not answer	2 (1)
Information not collected	14 (10)
When was the last consult with the dentist?	
Less than a year	53 (39)
One to two years	30 (22)
Three years or more	30 (22)
Other	7 (5)
It was Never	7 (5)
Do Not know/Did not answer	3 (2)
Information not collected	7 (5)
What was the reason for the last consult with the dentist?	
Review	24 (18)
Prevention	12 (9)
Pain	34 (25)
Extraction	20 (15)
Treatment	29 (21)
Other	5 (4)
It was Never	3 (2)
Do Not know/Did not answer	1 (1)
Information not collected	9 (7)

Table 2: Use of dental services.

Furthermore, the caries disease also has etiological factors associated with low socioeconomic indices due to the impossibility or difficulty of access to public services. Therefore, factors such as the monthly family income related to the number of individuals dependent on the same recipe can impact the condition of oral health [10].

In this way, the families of the schoolchildren of this research, according to table 2, had a predominantly low monthly income, of $400.00 until R$1999,00 – values ranging from half to two minimum wages. However, it should be noted that 52.55% of the households accommodate 1 to 2 people, and 46.72% accommodate 3 to 4 people, so the per capita income of each family may be less than a minimum wage.

In addition, in another study it was observed that children enrolled in social programs of financial assistance, obtained low rates of dental cavities, although not part of the conditionality of the programme the dental check-ups, a possible explanation pointed to by the authors is that the small increase of income can reduce the impact of stress factors to oral health [11].

In the case of the search for dental treatments, often occurs neglects or lack of knowledge of the need for preventive actions by individuals, where the search for these treatments are largely for the resolution of a problem installed (table 3). So, the big search public oral health services (table 3) may require a longer time to resolution of the health issue, since even though these dental visits occur, there is no resolution of the situation due to the ineffectiveness of the policy of health, oral health programmes, prevention activities, lack of resources or professionals [6,12].

On the other hand, going to the dentist only to perform treatments may be related to fear acquired by unpleasant experiences. Therefore, the patient's psychological conditioning should be associated, especially in the face of dental maneuvers that can distance him from dental practices, such as in activities involving the anesthesia or the use of the high rotation device [12].

Thus, understanding and knowing the oral health practices that people follow and the prevalence of health problems are basic information for formulating an appropriate oral health policy and program [6]. Thus, the socioeconomic profile data, together with the OHI-S and DMF-T indices, show the optimal path to be followed in this research.

Variables	Frequency N (%)
Pain Perception in the last 6 months	
Yes	66 (48,18)
No	56 (40,88)
Do Not know/did not answer	2 (1,46)
Information not collected	13 (9,49)
Characterization of the amplitude of pain described	
Too Little Pain	28 (20,44)
Little Pain	9 (6,57)
Relevant Pain	27 (19,71)
A lot of pain	20 (14,60)
Information not collected	53 (38,69)
Description of the self-perception of need for dental treatment	
Yes	103 (75,18)
No	13 (9,49)
Do Not know/did not answer	3 (2,19)
Information not collected	18 (13,14)
Total	137 (100)

Table 3: Self-Perceived Oral health.

In this subject, in a new assessment of dental nature, the application of the DMF-T index, according to methodologies proposed by national surveys [13] brought an average result of 0.62 decayed, missing or filled teeth by the mouth of every school-age child. In the case of the deciduous dentition, the dfm-t index was applied, generating an average result of 1.34 decayed, with indication of extraction or filled teeth per person. Other analyses, also derived from the application of these indices, are described in (table 4).

In the perspective of the oral health status of schoolchildren, in national studies, the DMF-T index for children of 12 years old, in 2003, obtained as an average of 2.78 decayed teeth, missing or filled teeth by the mouth of each rated, as its characterization in the northern states of Brazil, where the average was 3.13 [14]. These results have found a similarity to applied in children of 5 years evaluated by the dmf-t, which, at the national level, had an average of 2.8 decayed, with extraction indicated and filled teeth and, in the northern region, the result was changed to an average of 3.22 teeth affected [14].

Dental Condition	Frequency of teeth in the described condition N (%)
Healthy	13.517 (83,1%)
Carious	1.103 (6,8)
Restored with caries	33 (0,2)
Restored without caries	49 (0,3)
Lost due to caries	28 (0,2)
Lost for other reasons	17 (0,1)
Features sealant	3 (0)
Bridge or crown support	1 (0)
Not erupted	1.452 (8,9)
Trauma	32 (0,2)
Tooth excluded	37 (0,2)

Table 4: Characterization of the evaluated dental conditions.

In 2010, a national research [14] showed a small reduction in the national index, which for the 12-year-olds children obtained a mean DMF-T of 2.1 teeth at a national level and 3.16 affected teeth in the Northern region of the country. The same study brought a national average of 2.43 teeth characterized by the dmf-t index for children aged 5 years and, for the North region, the mean changed to 3.37.

Therefore, it was possible to observe that both the dmf-t and the general DMF-T of the schools of Palmas are below the results obtained by the National Oral Health Survey in 2003 and 2010. However, it is extremely important to establish an effective oral health policy in schools, since a healthy mouth allows individuals to practice their daily activities without any discomfort or embarrassment [6].

Moreover, because it has a large spectrum of risk factors, such as child sex, increased age, lack of exposure to fluoride, oral health behavior, unhealthy lifestyle, high sugar intake, low economic and health status, caries disease should be cautious, since the lack of treatment leads to pain, preventable medication prescription, loss of teeth, low self-esteem and absence of classes [9,15].

Considering the above, although the percentage of caries is small (6.8%, as shown in table 5), about 24% of the children evaluated need some treatment. From this perspective, according to IBGE (Brazilian Institute of Geography and Statistics), in 2017, the municipal schools in Palmas had 39,754 students enrolled [7], with this, it is estimated that about 9.500 schoolchildren of the city need dental treatment.

In addition, it is important to note that low school performance was associated with absence at school due to dental pain or infections [15]. Thus, it is observed the need to stimulate oral health teaching methods in schools through the implementation of the dental office, since preventive activities raise awareness about health topics from childhood [16].

Furthermore, from the use of OHI-S, the graph 1 describes the situation presented by each of the 222 schoolchildren assessed after application of the DMF-T index. From all these evaluated children, it was inferred that a total of 1.316 surfaces were obtained, plus 16 areas with incomplete evaluations.

Graph 1: Classification of IHO-S per child assessed.

With these data, it is denotes that observing the contrast between Good/Excellent (35%) and Bad/Poor (65%) conditions (graph 1) presented by the OHI-S results reveals a need for school intervention, since the kids in the school phase are relatively more accessible in relation to other population groups for lifestyle changes [6]. In addition, health education enables the development of critical awareness, making the child identify and replace harmful habits for healthy ones [17,18].

An alternative to this problem would be the implementation of a dental office at school, which shows an important instrument to reach the children from 7 to 12 years, and open to the possibility of planning actions for health promotion and prevention, especially for disadvantaged children [16].

In a continuous analysis, Graph 2 shows the prevalence of each of the scores in the population evaluated. In other words, it shows how much the dental plaque is disposed in the evaluated surfaces.

Graph 2: Distribution of the prevalence of each condition evaluated in the IHO-S.

Conclusion

Based on the results from the SB Brasil 2010 Project and from this research, a significant reduction in the prevalence caries was observed in school-age children. However, it is necessary to significantly implement pediatric dentistry in the municipality of Palmas, as a result of the high number of decayed teeth in relation to the filled ones, as well as an expressive result by the OHI-S, which emphasizes the importance of performing activities that promote prevention of diseases caused by the accumulation of biofilm as well as oral health policies aimed at schoolchildren.

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Conflict of Interest

This research does not present a conflict of interests.

Bibliography

1. Matos Mônica Bini. "A avaliação epidemiológica do município de Passa Tempo com vistas a uma reorganização do modelo de atenção em saúde bucal". Formiga: Universidade Federal de Minas Gerais, (2010).

2. Giacaman RA *et al*. "Oral health disparities among adolescents from urban and rural communities of central Chile". *Rural and Remote Health* 18.2 (2018): 4312.

3. Moraes Kelly Regina *et al.*. "Motivação de higiene dental utilizando brinquedos com temas odontológicos". *Conscientia e Saúde* 10.4 (2011): 723 -728.

4. Hu J., *et al*. "Dental Caries Status and Caries Risk Factors in Students Ages 12–14 Years in Zhejiang, China". *Medical Science Monitor* 24.1 (2018): 3670-3678.

5. Mattos-Vela MA., *et al.*. "Prevalencia y severidad de caries dental e higiene bucal en niños y adolescentes de aldeas infantiles, Lima, Perú". *Odontoestomatología* 19.30 (2017): 99-106.

6. Sukhabogi JR., *et al*. "Oral health status among 12- and 15-year-old children from government and private schools in Hyderabad, Andhra Pradesh, India". *Annals of Medical and Health Sciences Research* 4.3 (2014): 272-277.

7. Brasil. "Ibge - Instituto Brasileiro De Geografia E Estatística. "Brasil em Síntese". Brasília, (2017).

8. Brasil. "Resultados principais**:** Projeto SB Brasil 2010." Brasília, 2012. Ministério da Saúde (2018).

9. Arora A., *et al*. "Factors Associated with Dental Caries in Primary Dentition in a Non-Fluoridated Rural Community of New South Wales, Australia". *International Journal of Environmental Research and Public Health* 14.12 (2017): 1444-1449.

10. Queiroz FS., *et al*. "Saúde bucal, fatores socioeconômicos e qualidade de vida de crianças de 12 anos de idade da cidade de Patos-PB". *Archives of Health Investigation* 7.8 (2018): 316-322.

11. Calvasina P., et al. "The association of the Bolsa Familia Program with children's oral health in Brazil". Bmc Public Health 18.1 (2018): 1186.

12. Domingues SM., *et al*. "Saúde bucal e cuidado odontológico: representações sociais de mães usuárias de um serviço público de saúde**".** *Journal of Human Growth and Development* 18.1 (2008): 66-71.

13. Brasil. "Projeto SB Brasil 2003: condições de saúde bucal da população brasileira 2002-2003: resultados principais." Brasília, 2004. Ministério da Saúde. (2019).

14. Brasil. "Manual da equipe de campo". Brasília, 2009. Ministério da Saúde (2018).

15. Gopalan T., *et al*. "School absenteeism, academic performance, and self-esteem as proxy measures of oral health status: A cross-sectional study". *Journal of Indian Society of Pedodontics And Preventive Dentistry* 36.4 (2018): 339-349.

16. Chaves RA., *et al*. "Consultório odontológico na escola: análise da saúde gengival e do nível de higiene oral". *Revista Gaúcha de Odontologia* 59.1 (2011): 29-34.

17. Pivotto A., *et al*. "Hábitos de higiene bucal e índice de higiene oral de escolares do ensino público". *Revista Brasileira em Promoção da Saúde* 26.4 (2013): 455-461.

18. Ávalos-Márquez JC., *et al*. "Nivel de conocimientos en salud oral relacionado con la calidad de la higiene oral en escolares de una población peruana." *Kiru* 5.61 (2015): 61-65.