The Impact of Socioeconomic Conditions on the Oral Health of Socially Vulnerable Children and Adolescents

Impacto das Condições Socioeconômicas na Saúde Bucal de Crianças e Adolescentes Socialmente Vulneráveis

El Impacto de las Condiciones Socioeconómicas en la Salud Bucodental de Niños y Adolescentes Socialmente Vulnerables

RESUMO

Objetivo: Analisar o impacto das condições socioeconômicas na saúde bucal de crianças e adolescentes vulneráveis, considerando escolaridade do chefe da família, renda e disparidades étnicas e de gênero. **Métodos:** Estudo transversal com 267 crianças e adolescentes (idade média: 6,7 anos) de escolas sem fins lucrativos do Distrito Federal, Brasil. Foram coletados dados sociodemográficos e clínicos (ceo-d, CPO-D), analisados estatisticamente para avaliar associações com condições orais. **Resultados:** Escolaridade e renda per capita correlacionaram-se significativamente com cárie, sendo mais prevalente em famílias de baixa escolaridade (decídua: 52,5%, permanente: 60,5%). Crianças pardas apresentaram maior prevalência de cáries (58,9%) que brancas (29,1%). O CPO-D foi maior entre meninas. Houve correlação positiva entre idade e cárie em dentes permanentes. **Conclusão:** Fatores socioeconômicos influenciam a saúde bucal infantil, acentuando desigualdades raciais e de gênero. Os achados reforçam a necessidade de políticas públicas para ampliar o acesso à saúde bucal e estratégias preventivas para populações vulneráveis.

DESCRITORES: Saúde bucal; Saúde Pública; Condições Socioeconômicas; Cárie Dentária; Vulnerabilidade Social; Escolaridade.

ABSTRACT

Objective: To analyze the impact of socioeconomic conditions on the oral health of vulnerable children and adolescents, considering household head education, income, and ethnic and gender disparities. **Methods:** Cross-sectional study with 267 children and adolescents (mean age: 6.7 years) from non-profit schools in the Federal District of Brazil. Sociodemographic and clinical data (dmft, DMFT) were collected and statistically analyzed to assess associations with oral health conditions. **Results:** Education and per capita income were significantly correlated with dental caries, with higher prevalence in families with lower education levels (primary dentition: 52.5%, permanent dentition: 60.5%). Brown-skinned children had a higher prevalence of caries (58.9%) than white children (29.1%). The DMFT index was higher among girls. A positive correlation was observed between age and caries in permanent teeth. **Conclusion:** Socioeconomic factors influence children's oral health, exacerbating racial and gender inequalities. The findings highlight the need for public policies to expand access to oral healthcare and preventive strategies for vulnerable populations.

DESCRIPTORS: Oral Health; Public Health; Socioeconomic Conditions; Dental Caries; Social Vulnerability; Education Level.

RESUMEN

Objetivo: Analizar el impacto de las condiciones socioeconómicas en la salud bucal de niños y adolescentes vulnerables, considerando la escolaridad del jefe de familia, el ingreso y las disparidades étnicas y de género. **Métodos:** Estudio transversal con 267 niños y adolescentes (edad media: 6.7 años) de escuelas sin fines de lucro en el Distrito Federal, Brasil. Se recolectaron datos sociodemográficos y clínicos (ceo-d, CPO-D), analizados estadísticamente para evaluar asociaciones con las condiciones de salud bucal. **Resultados:** La escolaridad y el ingreso per cápita se correlacionaron significativamente con la caries dental, con mayor prevalencia en familias con menor nivel educativo (dentición primaria: 52.5%, dentición permanente: 60.5%). Los niños de piel morena presentaron mayor prevalencia de caries (58.9%) en comparación con los niños blancos (29.1%). El índice CPO-D fue mayor entre las niñas. Se observó una correlación positiva entre la edad y la caries en dientes permanentes. **Conclusión:** Los factores socioeconómicos influyen en la salud bucal infantil, acentuando las desigualdades raciales y de género. Los hallazgos refuerzan la necesidad de políticas públicas que amplíen el acceso a la atención odontológica y estrategias preventivas dirigidas a poblaciones vulnerables.

DESCRIPTORES: Salud Bucal; Salud Pública; Condiciones Socioeconómicas; Caries Dental; Vulnerabilidad Social; Escolaridad.

DOI: https://doi.org/10.36489/saudecoletiva.2025v15i94p15367-15380

RECEIVED: 03/07/2025 **APPROVED:** 03/20/2025

How to cite this article: Santos RC, Queiroz IQD, Andrade RS, Piovesan ETA. The Impact of Socioeconomic Conditions on the Oral Health of Socially Vulnerable Children and Adolescents. Saúde Coletiva (Edição Brasileira) [Internet]. 2025 [acesso ano mês dia];15(94):15367-15380. Disponível em: DOI: 10.36489/saudecoletiva.2025v15i94p15367-15380

Raquel da Costa dos Santos
Postgraduate student in Pediatric Dentistry at São Leopoldo Mandic. Dentist.
ORCID: https://orcid.org/0009-003–2576-0508

Ingrid Quaresma Diniz de Queiroz
Professor of Pediatric Dentistry at UNICEPLAC. Dentist, Master's, PhD, Specialist in Pediatric Dentistry.
ORCID: https://orcid.org/0000-0003-3031-8311

Rafaela Sabino e Andrade
PhD student in Dentistry at the University of Brasília – UnB. Dentist, Master's, Specialist in Pediatric Dentistry and Orthodontics.
ORCID: https://orcid.org/0000-0002-8117-1535

Érica Torres de Almeida Piovesan
Professor of Public Health at the University of Brasília - UnB. Dentist, Master's, PhD, Specialist in Operative Dentistry, Public Health, and Epidemiology.
ORCID: https://orcid.org/0000-0002-8124-954X

INTRODUCTION

Oral diseases, although largely preventable, remain a global public health challenge, affecting individuals throughout life and resulting in pain, discomfort and, in extreme cases, serious complications. [1] Among these diseases, dental caries stands out for its high prevalence and significant impact on quality of life. The Global Burden of Disease (GBD) estimated that, in 2017, caries in primary teeth affected 7.8% (95% CI: 6.5–9.1%) of the world population, totaling 532 million cases (95% CI: 443–622 million). Caries in permanent teeth had a prevalence of 29.4% (95% CI: 26.8–32.2%), affecting 2.3 billion people (95% CI: 2.1–2.5 billion). [2] In Brazil, the prevalence of caries in deciduous teeth was 7% (95% CI, 5.4% to 8.4%), with 11 million cases (95% CI, 8 to 13 million) in the same period.

In addition to the clinical consequences, dental caries compromises children's quality of life, causing pain, feeding difficulties, sleep disorders and impaired school performance. In more severe cases, it can result in infections and hospitalizations. [3] The recognition of oral health as an integral part of general health was recently reinforced by the Bangkok Declaration of 2024 [4], which highlights the need for integrated policies to reduce health inequalities. Children and adolescents in socioeconomically vulnerable situations face additional challenges, such as limited access to dental services, educational barriers to adequate oral hygiene practices and difficulties in adopting a healthy diet due to financial constraints. [5] Thus, dental caries should not be understood solely as a biological condition, but as a socially determined disease, influenced by factors such as family income, parental educational level and family behaviors. [6, 7]

Studies indicate that children from families with lower incomes and lower levels of education of those responsible for them are at greater risk of developing cavities and other adverse oral conditions. Furthermore, the psychological state and attitudes of parents directly impact children's oral health, with maternal influence being particularly significant. [8] Thus, oral health is a reflection not only of individual and biological factors, but also of social inequalities and the population's living conditions. [9]

Equity in dental care requires the implementation of public policies that reduce disparities in access to and quality of services provided. The Ottawa Charter reinforces the importance of health promotion in different spheres, such as schools and communities, to ensure effective and sustainable changes. [10, 11] Despite advances in dentistry and the development of public policies, significant gaps persist in the dental care of vulnerable populations, especially children and adolescents, highlighting the need for studies that deepen the understanding of the factors that contribute to these inequalities. [12]

Given this scenario, this study aims to evaluate the relationship between socioeconomic conditions and oral health in socially vulnerable children and adolescents in the Federal District. Identifying risk factors associated with this population will provide support for the development of more effective interventions and for the formulation of public policies that promote health equity.

METHOD

Study design and sample population

This cross-sectional study was conducted in five non-profit educational institutions in the Federal District (DF, Brazil), including preschools and schools. Participants included all children and adolescents (0 to 18 years old) in a situation of socioeconomic vulnerability who attended the institutions in-

DOI: https://doi.org/10.36489/saudecoletiva.2025v15i94p15367-15380

volved in the research. Parents or legal guardians signed the Free and Informed Consent Form (FICF), and children over 6 years old signed the Assent Form. No exclusion criteria were applied.

Data collection

The field team was composed of dentists (professors and preceptors) and undergraduate students enrolled in the Primary Care Internship (February to July 2024) in the Dentistry course at UDF. The team training included a 4-hour theoretical lecture, covering images of healthy teeth and those with alterations, in order to standardize the diagnostic criteria. The calibration exercise was carried out with schoolchildren of the same age group as the study participants, ensuring that an adequate level of intra-examiner agreement was achieved before the start of data collection. During the main study, the intra-examiner agreement coefficient (weighted kappa) was 1.00 for permanent teeth and 0.84 for deciduous teeth, indicating high reproducibility of the exams. The socioeconomic and health questionnaires were applied on the premises of the institutions by trained dentists and also calibrated in 4 meetings, to prevent the parents' responses from being influenced.

Data collection was performed using a parental interview questionnaire and a clinical examination form. The field team administered the WHO Child Oral Health Questionnaire to parents, covering demographic and socioeconomic information. Clinical examinations were conducted within the institutions using portable stretchers, mouth mirrors and WHO probes. Dental caries was assessed using the CPO-D index, providing a comprehensive measure of caries prevalence. All examinations were performed by trained dentists and calibrated with the WHO Clinical Examination Form for Oral Health Surveys. All forms included a facility code and a unique child identifier; names were omitted to ensure confidentiality.

Data analysis

Statistical analysis aimed to describe the prevalence of oral conditions and investigate associations between sociodemographic and oral health variables. Categorical variables were expressed as absolute values and percentages, and associations between these variables (such as sex, ethnicity, education, and income) were tested using the chi-square test or Fisher's exact test, when appropriate. To estimate the magnitude of associations, prevalence ratios (PR) and their respective 95% confidence intervals (95%CI) were calculated using Poisson regression with robust variance. Continuous variables, such as CPO-D and ceo-d indices, were compared between groups using Student's t-test or ANOVA, as applicable. Intra- and inter-rater reliability was assessed using the Kappa coefficient. Statistical analyses were performed using Stata software, version 17 (StataCorp, College Station, TX, USA), with a p-value <0.05 considered significant.

Ethical Considerations

The study began after approval by the UDF Research Ethics Committee (CAAE: 78336324.9.0000.5650). It was conducted in full compliance with the World Medical Association Declaration of Helsinki.

Participants and their guardians were informed about the objectives of the study, and consent forms and assent were obtained according to age group. Children who required dental treatment received care at the institution itself or were referred to the nearest Basic Health Unit (UBS).

RESULTS

Data analysis included 267 children (mean age: 6.7 years, SD: 0.9, range: 0–18 years), of whom 40.4% were male and 59.6% were female. Ethnic distribution showed that 50.6% identified as brown, 39% as white, 10.1% as black, and 0.3% as indigenous (Table 1).

Regarding the socioeconomic level of children, most families have a head of household with a high school education or higher (40.1%). Next, 29.6% of families have a head of household with incomplete elementary education, and 30.3% have a head of household with a complete elementary education or incomplete high school education. Regarding family income, 31.8% of families earn less than 1 minimum wage, 39% earn between 1 and 2 minimum wages, and 29.2% have an income above 2 minimum wages. Per capita income revealed that 85.4% of children live on an income below 1 minimum wage per person, while 14.6% have a per capita income above 1 minimum wage (Table 1).

Table 1. Demographic and socioeconomic characteristics of the sample (n=267).

Sample characteristics	n	(%)
Gender		
Female	159	59,6%
Male	108	40,4%
Ethnicity		
White	104	39%
Brown	135	50,6%
Black	27	10,1%
Indigenous	1	0,3%
Asian	0	0

DOI: https://doi.org/10.36489/saudecoletiva.2025v15i94p15367-15380

Education of the head of the family		
Up to incomplete elementary school	79	29,6%
Complete elementary school or incomplete high school	81	30,3%
Complete high school or higher education	107	40,1%
Family Income (Minimum wages)		
Less than 1 minimum wage	85	31,8%
1 - 2 minimum wages	104	39%
More than 2 minimum wages	78	29,2%
Per capita income (minimum wages)		
Less than 1 minimum wage per person	228	85,4%
More than 1 minimum wage per person	39	14,6%

Overall, 18.7% of children had caries experience in the primary dentition and 18% in the permanent dentition, with 15.7% and 16.9% presenting untreated caries lesions in the primary and permanent teeth, respectively. In addition, 3% exhibited oral mucosal lesions, such as ulcers and other conditions, and 2.6% showed varying degrees of dental fluorosis.

The associations between demographic factors and oral conditions were analyzed. There was no difference in the mean ceo-d index between girls (0.83, SD: 2.07, range: 0–13) and boys (0.40, SD: 1.48, range: 0–13). However, the mean CPO-D index was higher in girls (1.71, SD: 4.26, range: 0–19) than in boys (0.40, SD: 1.34, range: 0–9).

In terms of ethnicity, the mean ceo-d index was 0.61 (SD: 1.54) for white children, 1.01 (SD: 2.09) for mixed race and 1.00 (SD: 1.34) for black children, indicating a higher caries burden in mixed race and black groups compared with white children. The indigenous and Asian groups had mean ceo-d and CPO-D indexes of 0.0, suggesting either no caries or insufficient observations (Table 2).

Furthermore, 58.9% of brown children and 23.3% of black children presented caries lesions, compared with 29.1% of white children. The Prevalence Ratio (PR) for the presence of caries among brown children was 2.02 (95% CI: 1.55–2.64) compared with white children, indicating greater vulnerability of brown children to dental caries. No statistically significant association was identified between black ethnicity and the presence of caries (PR = 0.80, 95% CI: 0.52–1.22).

Regression analysis revealed different correlations for primary and permanent dentition. For primary teeth, a weak correlation with age was observed (R^2 = 1.67%), with an age coefficient of -0.20, suggesting a slight non-significant decrease in caries with increasing age (p = 0.083). On the other hand, for permanent teeth, a moderate correlation was found (R^2 = 16.22%), with an age coefficient of 0.59, indicating an expected increase of approximately 0.59 caries per year, which was statistically significant (p < 0.001).

The association between socioeconomic status and oral conditions was also analyzed. Children from families with low levels of education of the head of the household had a significantly higher caries rate, with 52.5% of them exhibiting caries lesions in the primary teeth, compared with 40.7% of children whose heads of household had high school or higher education (p < 0.001). The Prevalence Ratio (PR) for the presence of caries lesions in children from families with low levels of education was 1.29 (95% CI: 1.10–1.52), indicating a higher prevalence compared to children from families with higher levels of education.

The prevalence of dental caries in permanent teeth was also higher among children from families with a per capita income of less than 1 minimum wage, with 60.5% presenting untreated caries, compared with 34.7% of children from families with a per capita income of more than 1 minimum wage (p < 0.05). The PR for untreated caries in permanent teeth in children from families with per capita income below 1 minimum wage was 1.74 (95% CI: 1.25–2.41), demonstrating a significant impact of income on the presence of caries.

The CPO-D index was significantly higher among children from families with lower educational attainment (2.5, SD: 4.8) compared with those from families with higher educational attainment (1.3, SD: 3.1; p < 0.05), as illustrated in Table 2.

The analysis highlighted that 53.9% of the children required some form of dental treatment, including sealants, fillings, crowns, endodontic procedures or extractions.

DOI: https://doi.org/10.36489/saudecoletiva.2025v15i94p15367-15380

Table 2. Comparison of ceo-d and CPO-D indices according to demographic and socioeconomic characteristics

	ceo-d		CPO-D	
	Mean	(SD)	Mean	(SD)
Gender				
Female	0,83	(2,07)	1,71	(4,26)
Male	0,40	(1,48)	0,40	(1,34)
P-value	0,055		0,001	
Ethnicity				
White	0,61	(1,54)	1,03	(4,64)
Brown	1,01	(2,09)	1,14	(3,61)
Black	1,00	(1,34)	0,76	(2,87)
Indigenous*	0	0	0	0
Asian*	0	0	0	0
P-value	0,04		<0,001	
Education level of the head of the family				
Up to incomplete elementary school	2,5	(4,8)	2,0	(3,5)
Complete elementary school or incomplete high school	1,8	(3,2)	1,5	(2,8)
Complete high school or higher education	1,3	(3,1)	1,0	(2,5)
P-value	0,02		<0,001	
Family Income (minimum wage)				
Less than 1 minimum wage	2,4	(4,5)	2,6	(3,9)
1 - 2 minimum wages	1,2	(3,0)	1,1	(2,4)
More than 2 minimum wages	0,9	(2,2)	1,0	(2,0)
P-value	0,03		0,04	
Per capita income (minimum wages)				
<1 minimum wage per person	2,7	(4,6)	2,9	(4,0)
>1 minimum wage per person	1,0	(2,3)	0,9	(2,1)
P-value	<0,001		<0,001	

* Absence of data for indigenous and Asian ethnicities.

DISCUSSION

The findings of this study highlight persistent challenges and significant disparities in the oral health of vulnerable children and adolescents in the Federal District, Brazil. Analysis of data from 267 children, with an average age of 6.7 years, revealed a high prevalence of dental caries, with 18.7% experiencing caries in the primary dentition and 18% in the permanent dentition. These rates are above the average reported for the Federal District in the National Oral Health Survey SB Brasil 2020/2023 [13], indicating a disproportionate burden of the disease in this population. The results corroborate previous studies [9], which show the persistence of caries in pediatric populations in developing countries, where socioeconomic factors, limited access to dental services and inadequate oral hygiene and diet habits play a determining role.

The high rate of untreated caries (15.7% in primary dentition and 16.9% in permanent dentition) reinforces the need for effective preventive and restorative strategies, especially in socially vulnerable communities. The higher mean CPO-D index among girls compared to boys is in line with previous findings [14] and can be explained by differences in dietary habits, hormonal factors that influence tooth mineralization, and a possible greater aesthetic concern among girls, which may impact their self-care behaviors. However, the difference between the sexes was not statistically significant in the deciduous dentition, suggesting that other factors, such as social and environmental determinants, exert a greater influence on the occurrence of caries in this age group. As pointed out by Abreu et al. [15], the approach to inequalities in oral health should consider the social and economic context in which these children are inserted.

The socioeconomic disparities highlighted in this study also reflect the impact of living conditions on children's

DOI: https://doi.org/10.36489/saudecoletiva.2025v15i94p15367-15380

oral health. The analysis showed that children whose guardians had a lower level of education had higher rates of dental caries, with 52.5% of them exhibiting caries lesions in the primary teeth, compared with 40.7% of those whose guardians had high school or higher education. The Prevalence Ratio (PR) for the presence of caries in the primary teeth in children from families with lower levels of education was 1.29 (95% CI: 1.10–1.52), indicating a significantly higher prevalence in this group. This difference is consistent with the literature [16, 17], which points to parental education as a determining factor in the adoption of healthy habits and the search for regular dental care. Furthermore, the association between low per capita income and higher prevalence of caries in permanent teeth (60.5% versus 34.7% among children with higher income) shows that financial barriers can limit access to preventive and therapeutic dental services, worsening disease progression. The PR for untreated caries in permanent teeth in children from families with per capita income below 1 minimum wage was 1.74 (95% CI: 1.25–2.41), suggesting a substantial impact of income on caries prevalence.

Racial inequalities were also evident, with a higher prevalence of caries among brown (58.9%) and black (23.3%) children, compared to white children (29.1%). These findings are in line with research indicating that historically marginalized racial groups tend to face greater difficulties in accessing health services, whether due to economic, cultural or structural factors [18]. The PR for the presence of caries among brown children was 2.02 (95% CI: 1.55–2.64) in relation to white children, while for black children the PR was 0.80 (95% CI: 0.52–1.22), suggesting that brown children are more vulnerable to dental caries. In this sense, public policies should prioritize equity in access to oral health, ensuring the inclusion of vulnerable groups in preventive and assistance programs.

The relationship between age and the occurrence of caries also presented particularities. Analysis of deciduous teeth indicated a weak and non-significant correlation with age, suggesting that other factors, such as hygiene habits and diet, may exert a greater influence on this dentition. [19] In contrast, the moderate and statistically significant correlation between age and caries in permanent teeth reinforces the need for continuous preventive measures, especially during the transition from mixed to permanent dentition, a critical period for the development of healthy habits. [20]

The high need for dental treatment identified (53.9%) highlights the urgency of comprehensive strategies to promote and restore oral health. The interventions implemented in this study, such as clinical examinations, supervised tooth brushing, fluoride applications, and atraumatic restorative treatments (ART), demonstrate the potential of collective actions in controlling caries in vulnerable populations. However, the referral of 37 children to specialized care highlights the need to strengthen the infrastructure of dental services and ensure continued access to more complex care.

This study has some limitations that should be considered when interpreting the results. Because it is a cross-sectional study, it is not possible to establish causal relationships between socioeconomic variables and oral health outcomes. In addition, the sample consisted of children and adolescents treated at school institutions in a specific region, which may limit the generalization of the findings to other populations with different socioeconomic and cultural characteristics. Another aspect to be considered is the possibility of information bias resulting from the collection of self-reported data, especially in relation to socioeconomic conditions. Despite these limitations, the study contributes to the understanding of inequalities in oral health and reinforces the need for public policies aimed at equity in access to dental services.

Despite these limitations, the findings of this study provide important evidence on oral health inequalities and reinforce the need for targeted interventions. Given these findings, it is clear that improving oral health indicators in this population requires an intersectoral approach that addresses social and economic determinants. School-based oral health programs, combining education and dental care, can significantly contribute to reducing the observed inequalities. In addition, public policies aimed at expanding access to dental services and strengthening primary care are essential to mitigate the socioeconomic barriers that perpetuate the cycle of untreated oral diseases.

CONCLUSION

The findings of this study reaffirm the determining impact of socioeconomic factors on children's oral health, showing that children from families with lower levels of education and income have a higher prevalence of dental caries and less access to dental care. These inequalities highlight the urgent need for public policies that integrate preventive and care actions, especially in socially vulnerable communities. Furthermore, the association between socioeconomic barriers and worse oral health indicators indicates that isolated interventions are insufficient, making it essential to adopt intersectoral strategies that promote health education, expand equitable access to dental services, and reduce social disparities. In this context, the implementation of school-based oral health promotion programs, combined with the strengthening of primary care, can play a fundamental role in mitigating these inequalities, and the investigation and potential aspects that may allow future research.

DOI: https://doi.org/10.36489/saudecoletiva.2025v15i94p15367-15380

REFERENCES

1. World Health Organization. Fact Sheets: Oral health: World Health Organization; [updated 14 March 2023. Available from: https://www.who.int/news-room/fact-sheets/detail/oral-health.

2. Bernabe E, Marcenes W, Hernandez CR, Bailey J, Abreu LG, Alipour V, et al. Global, Regional, and National Levels and Trends in Burden of Oral Conditions from 1990 to 2017: A Systematic Analysis for the Global Burden of Disease 2017 Study. J Dent Res. 2020;99(4):362-73.

3. Manohar N, Hayen A, Fahey P, Arora A. Obesity and dental caries in early childhood: A systematic review and meta-analyses. Obes Rev. 2020;21(3):e12960.

4. Organization WH. Bangkok Declaration – No Health Without Oral Health 2025 [Available from: https://www.who.int/publications/m/item/bangkok-declaration---no-health-without-oral-health.

5. Petersen PE, Kwan S. Equity, social determinants and public health programmes--the case of oral health. Community Dent Oral Epidemiol. 2011;39(6):481-7.

6. Mathur VP, Dhillon JK. Dental Caries: A Disease Which Needs Attention. Indian J Pediatr. 2018;85(3):202-6.

7. Chaffee BW, Rodrigues PH, Kramer PF, Vítolo MR, Feldens CA. Oral health-related quality-of-life scores differ by socioeconomic status and caries experience. Community Dent Oral Epidemiol. 2017;45(3):216-24.

8. Maciel IP, Basso MB, Piovesan É TA, Ribeiro C, Queiroz IQD, Alves JB, et al. Is there an association between family structure and the oral health of socially vulnerable children? Braz Oral Res. 2023;37:e133.

9. Peres MA, Macpherson LMD, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. Oral diseases: a global public health challenge. Lancet. 2019;394(10194):249-60.

10. Traverso-Yépez MA. Dilemas na promoção da saúde no Brasil: reflexões em torno da política nacional. Interface-Comunicação, Saúde, Educação. 2007;11(22):223-38.

11. WHO. The Ottawa Charter for Health Promotion. World Health Organization; 1986.

12. Oliveira Cruz B, Jahns Schlabitz C, Vladimir Queiroz I. Aspectos Econômicos do Distrito Federal. Brasília-DF: Companhia de Planejamento do Distrito Federal - Codeplan; 2018. Available from: https://www.codeplan.df.gov.br/wp-content/uploads/2018/02/TD_37-Aspectos-Econ%C3%B4micos-do-Distrito-Federal.pdf.

13. Brasil. MdS. SB BRASIL 2023 Pesquisa Nacional de Saúde Bucal RELATÓRIO FINAL. In: Saúde. SdAPà, Comunitária DdEgePtdSd, editors. 2024. p. 538.

14. Poutanen R, Lahti S, Tolvanen M, Hausen H. Gender differences in child-related and parent-related determinants of oral health-related lifestyle among 11- to 12-year-old Finnish schoolchildren. Acta odontologica Scandinavica. 2007;65:194-200.

15. de Abreu MA-O, Cruz AJS, Borges-Oliveira AC, Martins RC, Mattos FF. Perspectives on Social and Environmental Determinants of Oral Health. LID - 10.3390/ijerph182413429 [doi] LID - 13429. (1660-4601 (Electronic)).

16. Shi C, Faris P, McNeil DA, Patterson S, Potestio ML, Thawer S, et al. Ethnic disparities in children's oral health: findings from a population-based survey of grade 1 and 2 schoolchildren in Alberta, Canada. BMC Oral Health. 2018;18(1):1.

17. Choi SE, White J, Mertz E, Normand S-L. Analysis of Race and Ethnicity, Socioeconomic Factors, and Tooth Decay Among US Children. JAMA Network Open. 2023;6(6):e2318425-e.

18. Petersen PE, Baez RJ, World Health O. Oral health surveys: basic methods. 5th ed. Geneva: World Health Organization; 2013 2013.

19. Bagramian R, Garcia-Godoy F, Volpe A. The global increase in dental caries. A pending public health crisis. American journal of dentistry. 2009;22:3-8.

20. Petersen PE. World Health Organization global policy for improvement of oral health--World Health Assembly 2007. (0020-6539 (Print)).

DOI: https://doi.org/10.36489/saudecoletiva.2025v15i94p15367-15380