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Association between socioeconomic contextual factor, dental care service availability, and prevalence of periodontitis in Brazil: a multilevel analysis

Associação entre o fator contextual socioeconômico, a disponibilidade de serviços odontológicos e a prevalência de periodontite no Brasil: uma análise multinível

Asociación entre el factor socioeconómico, la disponibilidad de servicios odontológicos y la prevalencia de periodontitis en Brasil: un análisis multinivel

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Abstract

This study aimed to examine the effect of dental care services on periodontitis cases in Brazilian municipalities. The sample comprised 3,426 individuals aged 35-44 years. Moderate to severe periodontitis with clinical attachment loss and probing depth was the dependent variable, both > 3mm. Its exploratory variables were grouped into four categories: (1) individual characteristics; (2) contextual development indicators; (3) health service and structural factors; and (4) dental care use. Data were collected using the SBBrasil 2010 Project, the Brazilian Institute of Geography and Statistics, the Brazilian Information System of Primary and Secondary Care, and the Program to Improve Access and Quality of Dental Specialization Centers (PMAQ-CEO). Multilevel logistic regression was used to assess associations of periodontitis with individual and context variables. Municipalities with > 1 CEO or > 1 of any centers were associated with periodontitis, with OR = 0.97 (95%CI: 0.55-1.71) and OR = 0.41 (95%CI: 0.17-0.97), respectively. Prevalence of periodontitis was more likely in older people, lower education levels, and individuals that sought dental visits for pain/extraction and periodontal treatment. Other dental care services availability were not associated with the prevalence of periodontitis.

Dental Care; Periodontitis; Dental Health Care

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Introduction

The relationship between primary and secondary care is crucial since it connects adequate treatment to health needs. An ideal interface is defined as one that refers all appropriate cases in the population, with no barriers to receive specialized care after a referral [1]. Some countries provided this interface within a universal system with a complex network of services in which clinics and hospitals are staffed by professionals from various specialties, enabling their cooperation and a multidisciplinary approach to patient needs [1,2,3]. In Brazil, primary care services are the gateway to the public health system, and dental care is provided mainly under oral health teams in the Family Health Strategy (FHS). Secondary care has been expanded through Dental Specialization Centers (CEO), ensuring comprehensive referral treatment [4,5]. The CEO operates as specialized units of higher technological density providing services usually not offered at the primary level [6].

There is little evidence of the effects of primary dental care on oral health and perhaps none about the effects of secondary dental care. Some studies have shown that the presence of primary dental care services showed no significant impact on dental caries and tooth loss in young individuals [7,8,9]. However, one study suggested that a preventive-oriented system may confer fewer dental caries [10]. Regarding periodontitis, a systematic review showed a poor association in the access to primary dental care at the municipal level [11]. Moreover, population-level periodontal services may not be effective in improving periodontal health as they focus only on those who seek help instead of the disease root causes, such as socioeconomic status, gender, or ethnicity [12,13].

Access to dental services varies among Brazilian municipalities because of differences in population coverage of primary health care or the presence of specialized services. Some studies state that this variation in access may explain differences in the prevalence of periodontitis [14,15,16]. Dental care availability was associated with moderate and severe clinical attachment loss (CAL) levels [14], and specialized dental care was associated with higher periodontal procedure rates [17].

Studies analyzing oral care models have focused on process and structure [18,19] or on implementing a program or health policies [20]. Few studies have investigated the effect of periodontal services on periodontal disease [11,12]. Nevertheless, there is no consensus on the influence of periodontal care services on periodontitis, and the role of confounding factors and mediators must be clarified [11]. To fill this knowledge gap, this study investigated the relationship between dental care services and prevalence of periodontitis among adults in Brazilian municipalities.

Methods

Study design, setting, and data

This cross-sectional study pooled data from various sources. The individual characteristics were obtained from the *SBBrasil 2010: Brazilian National Oral Health Survey* (SBBrasil 2010) [21]. Contextual variables were collected from the health information systems of all 177 municipalities participating in the SBBrasil 2010. The original sample totaled 9,779 individuals aged 35 to 44 years. This study focused on the last consultation of users of public services, causing 6,353 to be excluded. This criterion was used because it is unlikely that public services would affect users of other types of healthcare systems.

Gender, age, income, education level, and last visit to the dentist and the reason for that visit were extracted from the SBBrasil 2010. Municipal-level variables, such as urban population, population size, Gini index, the income component of the Municipal Human Development Index (HDI-M), and Gross Domestic Product (GDP) were obtained from the 2010 census data, available from the *Human Development Report* [22]. Coverage of primary dental care and outpatient production data for periodontics procedures were collected from the 2010 Ambulatory Information System, Brazilian Unified National Health System (SIA/SUS). The type and characterization of the services related to secondary dental care, trained periodontist rate, and production were obtained from the Brazilian National Register of Health Establishments (CNES).

Outcome and data measurement

The outcome variable was moderate to severe periodontitis measured at the individual level and defined as a combination of CAL and probing depth (PD) using The World Health Organization's (WHO) probe [14,23,24]. Six index teeth, one in each sextant, were examined, and the highest score was used to represent individual disease history in each sextant. Moderate to severe disease was defined as having at least two sites with > 3mm of CAL, and at least one site with > 3mm of PD, not necessarily at the same site.

Exposure variables selection

The exploratory variables were grouped into four categories: (1) individual characteristics: gender (men, women), age (years), education level (elementary school, high school, higher education), household income per capita [25] (< USD 50, USD 50-100, USD 150-300, > USD 300); (2) socioeconomic contextual development indicators: urban population (< 75%, > 75%), Gini index (< 0.50, 0.50-0.60, > 0.60), GDP per capita (< BRL 13,700, BRL 13,700-20,000, > BRL 20,000) HDI-M (< 0.7, ≥ 0.7), and population size (< 20,000, 20,000-100,000, > 100,000); (3) health services and structural factors: secondary dental care centers (none, ≥ 1 CEOs, ≥ 1 of any referral centers), primary dental care coverage (< 25%, 25-75%, > 75%) rate of primary dental care per 100,000 inhabitants (up to 10, 10-20, > 20), and presence of trained periodontist (none, at least one periodontist); (4) dental care use: root and coronal scaling rates per 100,000 inhabitants (lowest national tertile, second national tertile, highest national tertile), reason for last dental visit (check-up/prevention, pain/tooth extraction, treatment), and time since last dental visit (less than 1 year, 1-2 years, 3 or more years).

Statistical analysis

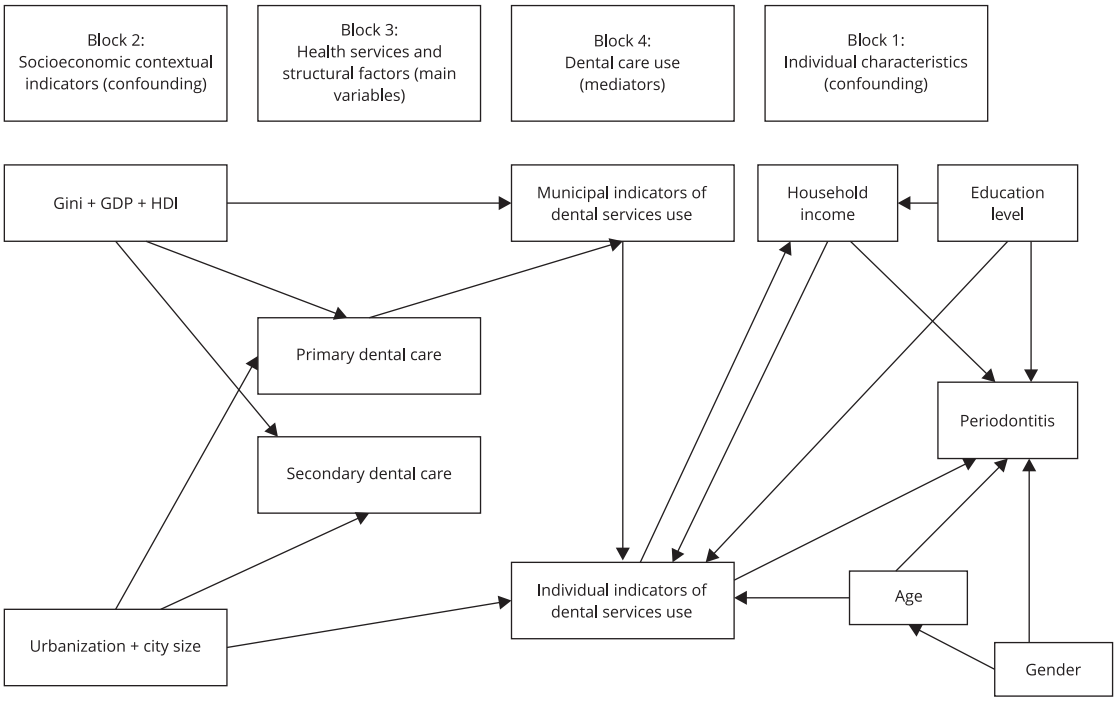
Descriptive data were transformed using sampling weights into the representative prevalence and means. Sampling weights were calculated based on the sampling fractions of each sample stage and were calibrated to correct for non-response [26].

Multilevel logistic regression with a random intercept was used to estimate the adjusted effect of the main variables on periodontitis. Individuals were nested in their respective municipalities, in the second-level units. The logit link function was used, and its exponentiated β values are odds ratio (OR). The variance partitioning coefficient (VPC) was calculated using Method D proposed by Goldstein et al. [27], in which the first level variance is fixed at 3.29 (p2/3) for dichotomous variables, assuming a threshold model. The percentage of variance explained was calculated, including the variance of the fixed linear predictor model, according to Equation 14.21 of Snijders & Bosker [28].

A total of five additive models were fitted based on four categories of variables from our theoretical model (Figure 1), using a hierarchical analysis framework [29]. The first model (M1) included individual-level confounding factors as variables; only those with $p < 0.10$ were retained in the next model. The second model (M2) included significant M1 factors and contextual indicators of socioeconomic development as variables; only non-M1 variables with $p < 0.10$ were retained in the next model. The third model (M3) included significant M2 indicators and structural healthcare factors as variables. The fourth model (M4) additionally included M3 variables and a dental service use factor; only variables with $p < 0.10$ were retained in the final model. The final model (M5) included the significant variables from each previous model. Each model fit was assessed using the Bayesian information criterion (BIC) and the percentage of variance was explained. All analyses were performed using Stata program (https://www.stata.com).

Figure 1

Theoretical model of explanatory variables.



GDP: Gross Domestic Product; HDI: Human Development Index.

Results

The study sample comprised 3,574 individuals, of which 101 were edentulous, and 47 had insufficient dental sextants for CAL examination. The final analytical sample comprised 3,426 individuals, of which 34.5% were men and 65.5% were women. The response rate was 38.9% at the household level, mainly because many houses were closed or uninhabited. Among participating households, 2.2% of individuals refused to be examined. The prevalence of moderate to severe periodontitis in Brazilian adults was 14.5%. Individuals with elementary school and lower household income per capita (< USD 50) had a higher prevalence of moderate to severe periodontitis (15.6% and 16.3%, respectively). Regarding service use, individuals who underwent check-up/prevention exams had a lower prevalence of periodontitis (7%). However, those who accessed the service in < 1 year had a higher prevalence of periodontitis (17.2%). Regarding secondary dental care, among 177 municipalities, 92 have CEOs.

Table 1 shows the distribution of moderate to severe prevalence of periodontitis based on the covariables at the city level among public healthcare users. Moderate to severe periodontitis was more prevalent in municipalities with > 75% primary dental care coverage (21.8%) or no CEO or other centers (18.2%). In addition, municipalities with > 20 primary dental care centers (per 100,000 inhabitants) had a higher prevalence of periodontitis (19%). The absence of a trained periodontist was higher for the prevalence of periodontitis (16.9%). Regarding treatment type, adults in cities in the upper tertile of root and coronal scaling rates per 100,000 inhabitants had 18.5% and 18.2% prevalence of periodontitis, respectively.

Table 1

Weighted prevalence in individuals with two or more sites with > 3mm of clinical attachment loss and > 3mm pocket depth according to city-level covariates among public healthcare users in Brazil.

Characteristics	Total sample		Moderate-severe periodontitis		p-value
	%	n	Weighted prevalence (%)	Cases (n)	
Total	100.0	3,426	14.5	435	
CEO					
None	33.2	513	18.2	64	0.14
≥ 1 centers	57.6	2,709	13.8	360	
≥ 1 of any referral centers	9.1	201	5.5	11	
Primary dental care coverage (%)					
< 25	52.3	1,283	12.3	144	0.04
25-75	23.4	1,526	12.0	211	
> 75	24.3	617	21.8	80	
Rate of primary care centers [per 100,000 inhabitants]					
Up to 10	38.7	1,219	11.8	153	0.15
10-20	22.0	1,432	11.2	181	
> 20	39.3	775	19.0	101	
Presence of a trained periodontist					
None	40.9	616	16.9	65	0.33
At least one periodontist	59.1	2,810	12.8	370	
Root scaling rate [per 100,000 inhabitants] (national tercile)					
Lowest	28.2	960	10.4	125	0.16
Second	30.7	944	13.1	101	
Highest	41.2	1,486	18.5	207	
Coronal scaling rate [per 100,000 inhabitants] (national tercile)					
Lowest	27.4	966	11.2	130	0.22
Second	30.1	918	12.5	94	
Highest	42.5	1,506	18.2	209	
GDP per capita (BRL)					
< 13,700	32.9	1,284	12.5	176	0.69
13,700-20,000	20.5	1,152	14.4	123	
> 20,000	46.6	990	16.0	136	
M-HDI (income component)					
< 0.70	21.0	523	14.8	62	0.92
≥ 0.70	79.0	2,903	14.4	373	
Population size (inhabitants)					
< 20,000	19.3	311	21.3	37	0.21
20,000-100,000	26.3	419	12.9	46	
> 100,000	54.5	2,696	12.9	352	
Urban population (%)					
< 75	11.0	367	10.3	38	0.23
> 75	89.0	3,059	15.0	397	
Gini index					
< 0.50	35.8	364	20.8	49	0.01
0.50-0.60	37.0	1,541	10.5	207	
> 0.60	27.2	1,521	11.7	179	

CEO: Dental Especializations Centers; GDP: Gross Domestic Product; HDI-M: Municipal Human Development Index.

Table 2 shows the crude association between individuals and contextual predictors for moderate to severe periodontitis. In the adjusted analysis presented in Table 3, M1 (individual socioeconomic factors) and M2 (contextual socioeconomic development indicators) were not shown because they were the control, but the p-values were presented at the Table's note. Age and education level were significant in M1 and remained associated in M2. Therefore, the M3 (contextual health service factors) showed that municipalities that have > 1 CEO (only) or > 1 center of any type were associated with periodontitis, with OR = 0.97 (95%CI: 0.55-1.71) and OR = 0.41 (95%CI: 0.17-0.97), respectively, when adjusted for age, education level (M1 + M2), primary dental care coverage, primary dental care rate, and trained periodontist level. Age, education level, > 1 CEO, and > 1 center of any type remained associated in M4 (dental care users). Individual and contextual service factors associated with the presence of a CEO or any center remained associated with periodontitis in the final model (M5). The risk of periodontitis was greater in older adults, individuals who sought dental visits for pain/extraction periodontal treatment, and municipalities with > 1 CEO. In contrast, individuals with higher education levels and/or living in cities with > 1 center of any type had a lower risk of periodontitis. The models indicated variation in the prevalence of periodontitis among cities based on the variance partition coefficient, which ranged from 15% to 17%.

As a sensitivity analysis, we included the number of remaining teeth as a control variable, since the likelihood of the outcome changes according to the number of teeth, but the results remained the same.

Table 2

Crude association between individuals and contextual variables, and moderate to severe periodontitis among individuals aged 35-44 years using multilevel regression analysis.

Characteristics	Unadjusted coefficients	
	OR	95%CI
Gender		
Men	1.00	
Women	0.99	0.79-1.23
Age	1.09	1.05-1.13
Education level		
Elementary school	1.00	
High school	0.73	0.56-0.93
College/University	0.45	0.32-0.64
Household income per capita (USD)		
< 50	1.00	
50-100	0.93	0.63-1.77
150-300	0.77	0.53-1.11
> 300	0.78	0.48-1.25
Gini index		
< 0.50	1.00	
0.50-0.60	0.81	0.48-1.38
> 0.60	0.78	0.43-1.41
HDI-M (income component)		
< 0.70	1.00	
≥ 0.70	1.09	0.70-1.71
Urban population (%)		
< 75	1.00	
> 75	1.24	0.73-2.12

(continues)

Table 2 (continued)

Characteristics	Unadjusted coefficients	
	OR	95%CI
GDP per capita (BRL)		
< 13,700	1.00	
13,700-20,000	0.87	0.52-1.44
> 20,000	1.16	0.71-1.89
Population size (inhabitants)		
< 20,000	1.00	
20,000-100,000	0.89	0.42-1.87
> 100,000	1.09	0.55-2.17
CEO		
None	1.00	
≥ 1 center	1.04	0.66-1.64
≥ 1 of any referral centers	0.44	0.20-1.01
Primary dental care coverage (%)		
< 25	1.00	
25-75	1.14	0.71-1.82
> 75	1.33	0.77-2.32
Rate of primary dental care centers [per 100,000 inhabitants]		
Up to 10	1.00	
10-20	1.19	0.71-1.99
> 20	1.22	0.70-2.12
Presence of trained periodontist		
None	1.00	
At least one periodontist	1.23	0.79-1.92
Root scaling rate [per 100,000 inhabitants] (national tertile)		
Lowest	1.00	
Second	0.92	0.53-1.60
Highest	1.57	0.97-2.55
Coronal scaling rate [per 100,000 inhabitants] (national tertile)		
Lowest	1.00	
Second	0.84	0.48-1.49
Highest	1.46	0.92-2.38
Reason for last dental visit		
Check-up/Prevention	1.00	
Pain/Tooth extraction	2.04	1.46-2.86
Treatment	1.43	0.99-2.08
Time since last dental visit (years)		
Less than 1	1.00	
1-2	1.06	0.86-1.30
3 or more	1.22	0.95-1.57
Fit indices		
Second level variance	0.666	
VPC	16.6%	
R2	0.0%	
Akaike information criterion	2,510.67	
Bayesian information criterion	2,522.92	

95%CI: 95% confidence interval; CEO: Dental Specialization Centers; GDP: Gross Domestic Product; OR: odds ratio; VPC: variance partitioning coefficient.

Table 3

Adjusted association between individuals and contextual variables, and moderate to severe periodontitis among individuals aged 35-44 years using multilevel regression analysis.

Characteristics	M3 *		M4 **		M5 ***	
	OR	95%CI	OR	95%CI	OR	95%CI
CEO						
None	1.00		1.00		1.00	
≥ 1	0.97	0.55-1.71	1.03	0.62-1.71	1.07	0.57-1.73
≥ 1 of any referral centers	0.41	0.17-0.97	0.49	0.19-1.23	0.45	0.20-1.03
Primary dental care coverage (%)						
≤ 25	1.00					
25-75	1.04	0.59-1.54				
> 75	1.40	0.69-2.80				
Rate of primary care centers [per 100,000 inhabitants] (%)						
Up to 10	1.00					
10-20	1.21	0.67-2.19				
> 20	1.22	0.59-2.55				
Presence of trained periodontist						
None	1.00					
At least one periodontist	1.19	0.67-2.10				
Root scaling rate [per 100,000 inhabitants] (national tercile)						
Lowest			1.00			
Second			1.00	0.49-2.05		
Highest			1.44	0.41-5.07		
Coronal scaling rate [per 100.000 inhabitants] (national tertile)						
Lowest			1.00			
Second			0.80	0.39-1.63		
Highest			0.99	0.31-3.16		
Reason for last dental visit						
Check-up/Prevention			1.00			
Pain/Tooth extraction			1.81	1.27-2.58		
Treatment			1.39	0.94-2.04		
Time since last dental visit (years)						
Less than 1			1.00		1.00	
1-2			0.98	0.81-1.20	1.81	1.28-2.56
3 or more			1.03	0.79-1.36	1.40	0.95-2.06
Fit indices						
Second level variance	0.644		0.669		0.707	
VPC	16.4%		16.9%		17.7%	
R2	4.8%		6.2%		5.3%	
Akaike information criterion	2,464.3		2,437.6		2,446.0	
Bayesian information criterion	2,537.7		2,529.1		2,501.0	

95%CI: 95% confidence interval; CEO: Dental Specialization Centers; OR: odds ratio; VPC: variance partitioning coefficient.

Note: p-values obtained from chunk test in logistic regression, equivalent to chi-square test. Model 1 (not shown in table): variables in the model: gender (p = 0.95), age (p < 0.01), education level (p < 0.01), income (p = 0.61); Model 2 (not shown in table): variables in the model: age (p < 0.01), education level (p < 0.01), urban population (p = 0.60), Gini coefficient (p = 0.44), GDP (p = 0.57), Human Development Index (p = 0.81), city size (p = 0.33).

* Model 3: variables in the model: age (p < 0.01), education level (p < 0.01), CEO (p = 0.10), primary dental care coverage (p = 0.54), primary dental care center rate (p = 0.88), presence of periodontist (p = 0.55);

** Model 4: variables in the model: age (p < 0.01), education level (p < 0.01), CEO (p = 0.25), root scaling (p = 0.77), coronal scaling (p = 0.79), time since last dental visit (p = 0.94), and reason for last dental visit (p < 0.01);

*** Model 5: variables in the model: age (p < 0.01), education level (p < 0.01), CEO (p = 0.08), and reason for last dental visit (p < 0.01).

Discussion

This study had two primary findings. Firstly, we found conflicting findings on the association of secondary dental care services with the prevalence of moderate to severe periodontitis. Secondly, the primary dental care findings were robust, and all three indicators showed higher prevalence in municipalities with higher coverage. These results disagree with a systematic review suggesting that higher coverage might be associated with a lower prevalence of periodontitis [11]. Although the relationship between secondary dental care and periodontitis had not been studied previously, the hypothesis that dental care service might be associated with a lower prevalence of periodontitis was not confirmed. Overall, our findings suggest that neither primary nor secondary dental services influence periodontitis at the population level.

This study had limitations and strengths. A limitation common to all observational studies is the impossibility to establish a temporal relationship, thus allowing reverse causality to occur. Dental care access might be associated with a lower prevalence of periodontitis because of treatment and prevention, but it may also be associated with higher levels since those seeking care get access. Moreover, this study could not control for some confounding variables, such as smoking and diabetes. Its strengths included data from representative general population samples using only public health service users. The study used valid and official information from health information systems. Finally, it was not possible to estimate the extension and severity of periodontitis due to methodological limitations.

Findings based on M3 showed that the chance of having periodontitis was lower when municipalities had > 1 referral center of any type (CEO or otherwise) as they may have some incentive to reach high-risk populations [30]. The effect of CEO occurred due to periodontal procedures, such as root and coronal scaling, being used to control the disease. However, neither variable was associated in model M4. Any explanation is speculative, but CEOs might have a different referral system, reaching individuals with major diseases who use primary healthcare or due to some residual confounding. Finally, the absence of an ideal interface between primary and secondary dental care for referral cases may increase demand-led procedures [31]. This study results may explain such differences in the prevalence of periodontitis among the municipalities.

Another remarkable point to be stressed is the lack of association between primary care and periodontitis. This study did not confirm the results found in previous studies showing associations between primary care coverage and periodontitis [14,32,33]. Methodological differences may explain this, since this study included only public service users within the last three years, unlike previous studies that included private service users. Another aspect to consider is the heterogeneity in outcome measurement among published studies. Prevalence estimates are influenced by the methodology used, including periodontitis definitions and registration protocols [34]. Furthermore, there is the possibility that some determinants of both dental care and periodontitis may confound the current findings, such as regional networks (one city center serving several others) and differences in work processes among oral health teams [26].

This study did not confirm the association between dental care and periodontitis. Nevertheless, the literature shows that the influence of health services is weak or absent regarding dental caries [10,35,36,37,38] and calculus and gingival bleeding [7]. In addition, health services may have no epidemiological impact since they can only reach a small proportion of those in need [39]. Regarding periodontitis, some cases might go undiagnosed or be asymptomatic, leading to some data that is qualitatively submerged [40] and possibly untreated, explaining the "iceberg phenomenon" [39]. The importance of socio-economic factors on dental care in the development of periodontal disease mirrors a pattern described for dental caries [8].

In this study, a few factors remained independently associated with periodontitis: the reason for the last dental visit (check-up/prevention, pain/tooth extraction, and treatment), age, and education level. The contextual effects of any secondary oral care services were moderately associated with a lower prevalence of periodontitis, suggesting that municipalities need specialized care models in addition to CEOs and the investigation of other health determinants. Studies on periodontitis and dental care services remain rare.

Contributors

L. V. Filgueiras collaborated in the study design, data analysis and interpretation, writing, and review; and approved the final version. F. S. Cabreira collaborated in the data analysis and interpretation, and review; and approved the final version. L. M. Pilotto collaborated in the data analysis and interpretation, and review; and approved the final version. R. K. Celeste collaborated in the study design, data analysis and interpretation, writing, and review; and approved the final version.

Additional information

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Resumo

Este estudo teve como objetivo examinar o efeito dos serviços de assistência odontológica nos casos de periodontite em municípios brasileiros. A amostra foi composta por 3.426 indivíduos de 35-44 anos de idade. A variável dependente foi periodontite moderada a grave com perda de inserção clínica e profundidade de sondagem, ambas > 3mm. As variáveis exploratórias foram agrupadas em quatro categorias: (1) características individuais; (2) indicadores contextuais de desenvolvimento; (3) serviços de saúde e fatores estruturais; (4) uso da assistência odontológica. Os dados foram coletados por meio do Projeto SBBrasil 2010, do Instituto Brasileiro de Geografia e Estatística, do Sistema de Informação da Atenção Primária e Secundária e do Programa de Melhoria do Acesso e Qualidade da Atenção dos Centros de Especialidade Odontológica (PMAQ-CEO). A regressão logística multinível foi utilizada para avaliar associações de periodontite com variáveis individuais e de contexto. Municípios com mais de um CEO ou mais que um centro de qualquer tipo de assistência foram associados à periodontite com OR = 0,97 (IC95%: 0,55-1,71) e OR = 0,41 (IC95%: 0,17-0,97), respectivamente. A prevalência de periodontite foi mais provável em idosos, indivíduos com menor escolaridade e indivíduos que procuraram consultas odontológicas para dor/extração e tratamento periodontal. A disponibilidade de outros serviços odontológicos não se associou à prevalência de periodontite.

Assistência Odontológica; Periodontite; Serviços de Saúde Bucal

Resumen

Este estudio tuvo como objetivo evaluar la eficacia de los servicios de atención odontológica en los casos de periodontitis en municipios brasileños. La muestra estuvo compuesta por 3.426 individuos de entre 35 y 44 años de edad. La variable dependiente fue periodontitis de moderada a severa, con pérdida de inserción clínica y profundidad de sondaje, que eran > 3mm. Las variables exploratorias se agruparon en cuatro categorías: (1) características individuales; (2) indicadores contextuales de desarrollo; (3) servicios de salud y factores estructurales; (4) uso de atención odontológica. Los datos se recabaron de Proyecto SBBrasil 2010, del Instituto Brasileño de Geografía y Estadística, del Sistema de Información de la Atención Primaria y Secundaria y del Programa para Mejorar el Acceso y la Calidad de los Centros de Especialización Odontológicas (PMAQ-CEO). Se utilizó la regresión logística multinivel para evaluar las asociaciones de periodontitis con variables individuales y contextuales. Los municipios con más de un CEO u otro tipo de centro de asistencia se asociaron a periodontitis con OR = 0,97 (IC95%: 0,55-1,71) y OR = 0,41 (IC95%: 0,17-0,97), respectivamente. La prevalencia de la periodontitis fue más probable en los ancianos, en las personas con menos nivel de instrucción y en las personas que buscaron citas odontológicas por dolor/extracción y tratamiento periodontal. La disponibilidad de otros servicios odontológicos no se asoció con la prevalencia de periodontitis.

Atención Odontológica; Periodontitis; Servicios de Salud Dental

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