# The association between individual and contextual factors and functional dentition status among adults in Rio Grande do Sul State, Brazil: a multilevel study

## A associação entre aspectos individuais e contextuais na dentição funcional de adultos do Rio Grande do Sul, Brasil: um estudo multinível

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### Abstract

*Functional dentition plays an important role in maintaining masticatory function, which is closely related to the number of teeth present in the mouth. The objective of this study was to investigate the association between individual and contextual factors and functional dentition (defined as the presence of at least 20 teeth) in Brazilian adults. This was a multilevel cross-sectional population-based study with a two-level structure and a total sample of 10,407 adults from 84 municipalities (counties). The exposures at both levels were demographic, socioeconomic, and oral health treatment-related. Multivariate analyses showed that higher prevalence rates of functional dentition were associated ($p < 0.01$) with municipalities having higher mean income and fluoridated water supply and with individuals living in urban areas, younger adults, males, those with more schooling and higher income, those that reported having visited the dentist in the previous 12 months, and those with access to information on prevention. The findings suggest that research on tooth loss and functional dentition should take different socioeconomic factors into account.*

*Tooth Loss; Oral Health; Socioeconomic Factors*

### Introduction

Tooth loss is one of the main public health problems affecting the adult population worldwide [1]. This situation directly and indirectly influences the individual's overall health. Compromised masticatory function affects quality of diet, increasing the risk of various health problems like cardiovascular diseases, physical disabilities and even death [2,3]. Edentulous individuals show lower consumption of important macro and micronutrients as compared to those with functional dentition [4,5]. For example, edentulism without rehabilitation with prostheses has been associated with reduced intake of carbohydrates, vitamins, and minerals [4]. Obesity [3] and malnutrition [5] have also been linked to tooth loss.

There are various causes of tooth loss, the main ones being dental caries and periodontal disease. Other factors include access to dental services, health system organization, and oral health care [6,7]. Higher tooth loss rates have been associated with unfavorable socioeconomic conditions [8,9].

Functional dentition plays an important role in maintaining masticatory function, which is closely related to the number of teeth present in the mouth [10,11,12]. According to this concept, maintenance of functionality requires a minimum of 20 teeth well distributed in the upper and lower dental arches. In 1992, the World Health Organization (WHO) declared the lifetime reten-

tion of functional and aesthetic natural dentition with no fewer than 20 teeth and without requiring dental prostheses as one of the goals of oral health practices [13].

According to data from the latest Brazilian nationwide oral health survey (*SB Brasil: Oral Health Conditions in the Brazilian Population*), the estimated prevalence of functional dentition, namely the presence of 20 or more teeth in the mouth, was 54% (95%CI: 53-55) in the 35 to 44-year age bracket. Similar results were reported in the Southern geographic region of the country (55%, 95%CI: 53-57) [14].

Factors associated with dental loss, and thus with the loss of functional dentition, are relatively well established at the individual level. Edentulous persons usually have lower incomes and less schooling, less access to services, and poor self-rated oral health [15]. However, it has been argued that explanations based purely on individual data are insufficient and fail to capture important determinant of health and disease, the characteristics of groups and contexts to which the individuals belong [16,17]. The literature is thus limited on the influence of contextual aspects on oral health in individuals and groups [18]. According to a recent study of 2,680 Australian adults in 60 neighborhoods, residence in neighborhoods with better socioeconomic conditions attenuated the risk of dental loss associated with low individual income [19]. The current study's aim was to investigate the association between individual and contextual factors in the functional dentition of adults in the State of Rio Grande do Sul, Brazil.

## Methodology

This study used data from the State of Rio Grande do Sul, southern Brazil, with approximately 10,187,841 inhabitants (Government of the State of Rio Grande do Sul; http://www.estado.rs.gov.br, accessed on 12/Feb/2007). The target population for this study was adults 35 to 44 years of age, living in the State, who according to the 2000 population census included 1,547,458 inhabitants (Brazilian Institute of Geography and Statistics – IBGE; http://www.ibge.gov.br/censo, accessed on 6/Aug/2007).

Data were used from two levels, individual and contextual. Individual data were collected from clinical examinations and structured interviews based on a cross-sectional population-based study conducted by the Rio Grande do Sul State Health Department in 2003 [20]. At the contextual level, secondary data were used from the participating municipalities.

To determine the number of municipalities comprising the sample, a simple random sample was calculated with a 95% confidence interval (95%CI) and a sampling error of ten percentage points. A total of 95 municipalities, pre-stratified by population size and region of the State, were invited to participate in the study. The number of individuals was calculated using the population according to IBGE data with 1996 as the base year, a 95% confidence interval, sample error of four percentage points, and 76.2% caries rate at 12 years of age [21]. It was estimated that a total of 40,923 persons would be needed in the different age brackets and 16,316 persons 35-44 years of age. Dentists were trained and calibrated to conduct the clinical examination, and structured interviews were held with the participants [20].

The study outcome was defined as the presence of 20 or more teeth in the oral cavity (code 1) or fewer than 20 teeth (code 0), with the former called functional dentition [22]. Exposure variables at the individual level were demographic (gender, skin color, and age), socioeconomic (income and schooling), and dental services-related: visit to the dentist in the previous 12 months, place of care, and information on preventive dental health measures.

The demographic variable "skin color" was self-reported and classified as white, black, brown, and other. Analysis of the age variable considered two age groups, namely individuals 35-39 and 40-44 years of age. The variables used to characterize socioeconomic status at the individual level were collected in discrete form (family income in *Reais* and years of schooling) and categorized in the highest 25%, intermediate 50%, and 25% lowest scores. Thus, the monthly income variable was re-coded as low (R$ 0.00-R$ 279.00), medium (R$ 280.00-R$ 800.00), and high (≥ R$ 801.00), and the schooling variable as low (0-4 years of schooling), medium (5-8 years), and high (≥ 9 years).

Four categories were used for place of treatment: public, private, other, and none (no history of dental treatment). The variables for visits to the dentist in the previous 12 months and receiving preventive information on oral health were analyzed dichotomously, with having visited a dentist in the previous 12 months and having preventive information as the respective reference codes.

Data at the contextual level were representative of the municipalities (counties) that participated in the oral health survey. The secondary databases used were the *Population Census, 2000* [23], the United Nations Development Program (UNDP) [24], and the Brazilian Federal Board

of Dentistry (CFO. http://www.cfo.org.br/estatística/default.cfm, accessed on 13/June/2007).

The IBGE is the official government agency in charge of conducting the national population census in Brazil. Its database was used for the contextual variables on income and schooling [23]. Like the individual socioeconomic variables, the contextual variables were categorized as the highest 25% of scores, the intermediate 50%, and the lowest 25%. This strategy aimed to better emphasize the influence of socioeconomic factors, on the oral health of adults by comparing the extreme values for each variable. The strategy also sought to relate the data to the context in which the study was performed, since it used the data distribution itself to define the categories. In other words, an individual or municipality could only be classified as having high or low socioeconomic status in comparison to other individuals or municipalities in Rio Grande do Sul. Income referred to the mean monthly income of the heads of permanent private households per municipality and was thus analyzed as low (income ≤ R$ 425.00), medium (R$ 426.00 to R$ 635.00), and high (≥ R$ 636.00). The schooling variable was evaluated as years of schooling in the following categories: low (≤ 3.8), medium (3.9-5.1), and high (≥ 5.2 years of schooling).

The aim of the UNDP is to fight poverty, adopting a comprehensive strategy that takes each country's specificities into account, to promote democratic governance, provide support for public policy implementation, and foster integrated local development [24]. The UNDP database was used for the Gini index (low ≤ 0.48, medium 0.49 to 0.56, and high ≥ 0.57), which measures the degree of inequality among individuals according to per capita household income. It varies from 0, when there is no inequality, that is, all individuals' income is the same, to 1, when inequality is maximum; and the human development index or HDI (low ≤ 0.752; medium, from 0.753 to 0.814; and high ≥ 0. 815), as an indicator of quality that is not limited only to the economic dimension in the evaluation of a population's living conditions, but also considers social and intellectual aspects. These dimensions also have the same importance in the index, which varies from 0 (worst) to 1 (best). These data are for the year 2000.

In its official website, the Brazilian National Board of Dentistry (CFO) provides nationwide data on Brazilian dentists (http://www.cfo.org.br/estatística/default.cfm, accessed on 13/June/2007). This study used data for the number of dentists working in each city included in the study for the years 2002 and 2003, and this variable was analyzed as the total population in each municipality divided by the number of dentists (1,000-10,000 inhabitants/dentist, ≥ 10,001 inhabitants/dentist, and no dentist). The study also analyzed the place of residence (urban versus rural) and time since implementation of fluoridation in the public water supply (≥ 10 years, 5-9 years, < 5 years), both of which variables came from the national oral health survey.

Data analysis used Stata 9.0 (Stata Corp., College Station, USA) and MLwiN 2.0 (Centre for Multilevel Modeling, Bristol, UK). Descriptive analyses were performed to verify the frequency of the clinical and non-clinical variables. Since the outcome was dichotomous, the chi-square test was used for the bivariate analysis and multilevel logistic regression. Fixed-effects random models were estimated using the second-order PQL method. The aim of this analysis was to estimate the odds ratios (OR) for functional dentition (≥ 20 teeth present) and the 95%CI.

The multivariate analysis followed a theoretical model of determination (Figure 1) and was conducted as follows: first, the contextual variables were adjusted for each other. Next, adjustment was performed for the individual demographic variables and finally for the individual health-system variables. The variables at each level were adjusted for each other and only variables with $p < 0.01$ were maintained for the next level. Thus, all the variables in the respective level were entered into the model, removing those with the lowest significance one by one. This strategy aimed to minimize type 1 errors due to the fact that this was a large sample and with high power to detect associations. Likewise, associations between the outcome and the exposures were considered significant at the 1% level ($p < 0.01$) and without intersecting the 95%CI.

The project *SB/RS – Oral Health Conditions in Rio Grande do Sul State* was approved by the National Council on Research Ethics (document 581/2000, July 21, 2000). All the participants signed a free and informed consent form [20].

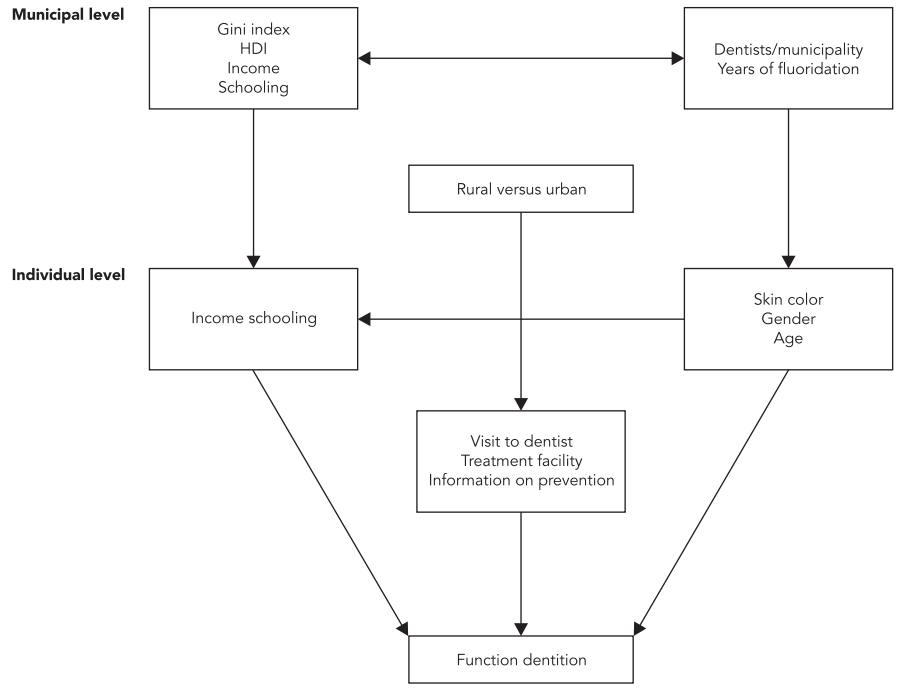
## Results

Of the 95 selected municipalities, 11 (12%) did not participate in the study. As for the individuals, 218 (2.1%) were excluded because they lacked information on functional dentition. The data analysis thus included 10,407 adults from 84 municipalities [19].

The majority of the sample consisted of women (63.1%), persons from 35 to 39 years of age (51.3%), white (82%), with 5 or more years of schooling (70.1%), and with monthly income from R$ 280.00 to R$ 800.00 (50.7%). Prevalence

Figure 1

Theoretical model for factors associated with functional dentition (≥ 20 teeth present) in adults.




HDI: Human Development Index.

of functional dentition was 54.8% (95%CI: 53.8-55.7) (Table 1).

As for individual factors, the crude analysis showed higher functional dentition rates in younger persons, males, those with more schooling and higher income, those who had visited the dentist in the previous 12 months, and those who had received information on prevention (Table 1). As for contextual factors, the highest functional dentition rates were in municipalities with higher income, higher schooling, higher HDI, more than ten years of fluoridation, and place of residence in urban areas (Table 2).

The multivariate analysis showed that individuals living in municipalities with high schooling and more than ten years of fluoridation in the public water supply showed an increase of 72% (OR = 1.72; 95%CI: 1.17-2.53) and 78% (OR = 1.78; 95%CI: 1.32-2.40) in the odds of presenting functional dentition as compared to those in municipalities with low schooling and without fluoridation. Likewise, the likelihood of adults living in urban areas having 20 or more teeth was 23% greater (OR = 1.23; 95%CI: 1.09-1.39) than those living in rural areas (Table 3). As for individual variables, the highest functional dentition rates were in younger individuals (35-39 vs. 40-44 years: OR = 2.49; 95%CI: 2.28-2.72), men (*vs.* women: OR = 2.04; 95%CI%: 1.86-2.25), those with more schooling (vs. lower: OR = 3.67; 95%CI: 3.20-4.21), higher income (vs. lower: OR = 1.54; 95%CI: 1.33-1.78), those had visited the dentist in the previous year (vs. no visit: OR = 1.91; 95%CI: 1.74-2.10), and those that reported having received information on prevention (vs. not: OR = 1.19; 95%CI: 1.08-1.32) (Table 3).

## Discussion

This study aimed to assess the association between individual and contextual factors in the functional dentition rate. Individuals living in urban areas and in municipalities with better socioeconomic standards and a longer history of fluoridation in the public water supply showed higher functional dentition rates.

Table 1

Distribution, prevalence, and crude odds ratio (OR) for functional dentition (≥ 20 teeth present) according to individual variables. Rio Grande do Sul State, Brazil, 2002-2003.

| | Distribution | | Functional dentition | Crude OR | 95%CI |
|---|---|---|---|---|---|
| | n | % | | | |
| Age groups (in years) [n = 10,407] | | | | | |
| 40-44 | 5,064 | 48.7 | 44.9 | 1.00 | |
| 35-39 | 5,343 | 51.3 | 64.2 | **2.41** | **2.22-2.63** |
| Gender [n = 10,407] | | | | | |
| Female | 6,569 | 63.1 | 49.6 | 1.00 | |
| Male | 3,838 | 36.9 | 63.8 | **1.95** | **1.79-2.13** |
| Skin color [n = 10,399] | | | | | |
| Black | 547 | 5.3 | 58.0 | 1.00 | |
| Brown | 610 | 5.9 | 59.0 | 1.03 | 0.80-1.34 |
| Other | 718 | 6.9 | 59.6 | 0.96 | 0.74-1.24 |
| White | 8,524 | 82.0 | 53.8 | 0.91 | 0.75-1.10 |
| Family income (individual level in *Reais*) [n = 10,231] * | | | | | |
| ≤ 279.00 (low) | 2,516 | 24.6 | 45.0 | 1.00 | |
| 280.00-800.00 (medium) | 5,184 | 50.7 | 52.0 | **1.28** | **1.16-1.42** |
| ≥ 801.00 (high) | 2,531 | 24.7 | 67.0 | **2.55** | **2.23-2.90** |
| Schooling (individual level in years) [n = 10,229] * | | | | | |
| ≤ 4 (low) | 3,061 | 29.9 | 38.1 | 1.00 | |
| 5-8 (medium) | 4,529 | 44.3 | 52.5 | **1.71** | **1.55-1.89** |
| ≥ 9 (high) | 2,639 | 25.8 | 75.1 | **4.41** | **3.89-5.00** |
| Visit to dentist in previous 12 months [n= 10,233] | | | | | |
| No | 5,137 | 50.2 | 44.9 | 1.00 | |
| Yes | 5,096 | 49.8 | 63.3 | **2.16** | **1.98-2.35** |
| Treatment facility [n = 10,233] | | | | | |
| Private | 4,730 | 46.2 | 59.3 | 1.00 | |
| Other | 197 | 1.9 | 58.9 | 0.79 | 0.58-1.08 |
| Never visited | 129 | 1.3 | 80.6 | **3.74** | **2.37-5.89** |
| Public | 5,177 | 50.6 | 48.3 | **0.69** | **0.63-0.75** |
| Information on prevention [n = 10,233] | | | | | |
| No | 2,977 | 29.1 | 47.9 | 1.00 | |
| Yes | 7,256 | 70.9 | 56.5 | **1.49** | **1.35-1.64** |

Note: values in boldface are statistically significant ($p < 0.01$).

* Collected continuously and categorized as the highest 25%, middle 50%, and lowest 25%.

The current study agrees with previous studies in Brazil, reporting an association between unfavorable local socioeconomic conditions and high tooth loss rates [8,28,29], and thus lower functional dentition rates. What are the possible explanations for this finding? The most plausible explanation is that municipalities with better physical and social characteristics like transportation, community integration, and health services infrastructure can be expected to facilitate access to health-related services and activities [27]. Thus, municipalities with better socioeconomic conditions provide better opportunities for persons to preserve their teeth, especially through greater availability and access to dental services [19]. Another possibility is that some characteristics of municipalities with higher mean per capita income may attenuate the risks associated with unfavorable individual socioeconomic status [19]. In Brazil, the analysis of data from the *National Household Sample Survey* showed that the proportion of adults that had never visited the dentist was 16 times higher in the group consisting of the poorest 20% of the population as

Table 2

Distribution, prevalence rates, and crude odds ratios (OR) for functional dentition (≥ 20 teeth present) according to contextual variables. Rio Grande do Sul State, Brazil, 2002-2003.

| | Distribution | | Functional dentition (%) | Crude OR | 95%CI |
|---|---|---|---|---|---|
| | n | % | | | |
| Gini [n = 10,407] * | | | | | |
| ≥ 0.57 (high) | 2,763 | 26.5 | 58.0 | 1.00 | |
| 0.49-0.56 (medium) | 5,235 | 50.3 | 55.9 | 1.01 | 0.72-1.43 |
| ≤ 0.48 (low) | 2,409 | 23.1 | 48.8 | 0.78 | 0.52-1.18 |
| HDI [n = 10,407] * | | | | | |
| ≤ 0.752 (low) | 2,832 | 27.2 | 49.2 | 1.00 | |
| 0.753-0.814 (medium) | 4,175 | 40.1 | 53.4 | 1.23 | 0.88-1.73 |
| ≥ 0.815 (high) | 3,400 | 32.7 | 61.1 | **1.53** | **1.05-2.24** |
| Family income (municipal level in *Reais*) [n = 10,407] * | | | | | |
| ≤ 425.00 (low) | 2,359 | 22.7 | 47.4 | 1.00 | |
| 426.00-635.00 (medium) | 4,756 | 45.7 | 52.1 | 1.17 | 0.83-1.63 |
| ≥ 636.00 (high) | 3,292 | 31.6 | 63.9 | **1.78** | **1.21-2.62** |
| Schooling (municipal level in years) [n = 10,407] * | | | | | |
| ≤ 3.9 (low) | 2,266 | 21.8 | 43.9 | 1.00 | |
| 4.0-5.1 (medium) | 5,133 | 49.3 | 52.1 | 1.35 | 0.99-1.85 |
| ≥ 5.2 (high) | 3,008 | 28.9 | 67.6 | **2.49** | **1.74-3.57** |
| Inhabitants/dentist [n = 10,407] | | | | | |
| No dentists | 5,174 | 49.7 | 48.1 | 1.00 | |
| ≥ 10,001 | 1,598 | 15.4 | 67.2 | **1.95** | **1.34-2.83** |
| 1,000-10,000 | 3,635 | 34.9 | 58.8 | 1.35 | 1.00-1.84 |
| Fluoridation time (in years) [n = 10,407] | | | | | |
| < 5 | 5,519 | 53.0 | 45.5 | 1.00 | |
| 5-9 | 763 | 7.3 | 60.6 | **1.92** | **1.20-3.07** |
| ≥ 10 | 4,125 | 39.6 | 66.1 | **2.21** | **1.72-2.86** |
| Rural versus urban [n = 10,407] | | | | | |
| Rural | 2,670 | 25.7 | 46.0 | 1.00 | |
| Urban | 7,737 | 74.3 | 57.8 | **1.29** | **1.14-1.46** |

HDI: Human Development Index.

Note: values in boldface are statistically significant ($p < 0.01$).

* Collected continuously and categorized as the highest 25%, middle 50%, and lowest 25%.

compared to the wealthiest 20% [7]. In addition, it had been argued previously that individual health behaviors cannot be understood without taking into consideration the characteristics and processes occurring in both the immediate and wider setting. For example, a person's diet, which has a strong influence on his or her oral health, is influenced not only by personal tastes or perceptions, but also by the local social context, for example when healthy foods are more accessible in areas with better socioeconomic conditions [28,29]. Likewise, socioeconomically privileged areas could have better access to information, due to greater social capital and lower levels of violence and stress, which would influence health-related behaviors [19,30,31,32].

Another important factor in the prevention of oral diseases is fluoridation of the public water supply, considered one of the ten most relevant public health measures in the 20th century [33]. This measure has been the focus of numerous studies, and has been recommended by the WHO as an important factor for offsetting oral health inequalities in public health [34]. Water supply fluoridation is capable of reducing prevalence and incidence of dental caries in various age groups, decreasing treatment costs for oral diseases and reducing the inequalities between

Table 3

Odds ratios (OR) for functional dentition (≥ 20 teeth present, crude and adjusted) adjusted for contextual and individual variables in adults in Rio Grande do Sul State, Brazil, 2002-2003 (n = 10,407).

| Levels | Exposures | Adjusted OR | 95%CI |
|---|---|---|---|
| 1 | Contextual | | |
| | Mean municipal schooling (in years) | | |
| | ≤ 3.98 (low) | 1.00 | |
| | 3.981-5.1 (medium) | 1.26 | 0.95-1.67 |
| | ≥ 5.2 (high) | **1.72** | **1.17-2.53** |
| | Fluoridation time (in years) | | |
| | ≤ 5 | 1.00 | |
| | 5-9 | **1.88** | **1.20-2.95** |
| | ≥ 10 | **1.78** | **1.32-2.40** |
| | Rural versus urban | | |
| | Rural | 1.00 | |
| | Urban | **1.23** | **1.09-1.39** |
| 2a | Individual, socio-demographic | | |
| | Age bracket (in years) | | |
| | 40-44 | 1.00 | |
| | 35-39 | **2.49** | **2.28-2.72** |
| | Gender | | |
| | Female | 1.00 | |
| | Male | **2.04** | **1.86-2.25** |
| | Family income (in *reais*) | | |
| | ≤ 279.00 (low) | 1.00 | |
| | 280.00-800.00 (middle) | 1.01 | 0.90-1.13 |
| | ≥ 801.00 (high) | **1.54** | **1.33-1.78** |
| | Schooling (in years) | | |
| | ≤ 4 | 1.00 | |
| | 5-8 | **1.61** | **1.45-1.78** |
| | ≥ 9 | **3.67** | **3.20-4.21** |
| 2b | Individual, dental services | | |
| | Visit to dentist in previous 12 months | | |
| | No | 1.00 | |
| | Yes | **1.91** | **1.74-2.10** |
| | Information on prevention | | |
| | No | 1.00 | |
| | Yes | **1.19** | **1.08-1.32** |

Note: values in boldface are statistically significant (p < 0.01); variables adjusted for others at the same level and higher.

groups with distinct socioeconomic conditions [35,36,37]. Analyzing data from adults in Rio Grande do Sul State, the current study showed a positive association between higher functional dentition rates and longer exposure to fluoridated water supply.

As for geographic location, the study shows that individuals living in rural areas show a higher risk of lacking functional dentition. The same situation has been found in other studies on Brazilian adults [8,38]. This situation may result from the infrastructure distribution, to the disadvantage of individuals living in rural areas with less access to fluoridated water supply and dental services.

As for individual socioeconomic factors, the current study corroborates the common findings in the Brazilian and international literature. Higher tooth loss rates have been associated with low income, low schooling, and low socioeconomic status [8,25,38,39,40,41,42,43,44,45]. Individuals with unfavorable socioeconomic status generally have fewer teeth in their mouths due to limited

access to dental services and the option for extractions rather than more conservative dental treatment [7,43].

The high functional dentition rate among men corroborates other Brazilian studies with similar findings [2,25,38]. The hypotheses for explaining this phenomenon could include the higher caries rate among adolescent girls as opposed to boys and the greater use of dental services by women as compared to men, both of which factors favor early tooth loss, especially due to the option for tooth extraction rather than conservative treatment among socioeconomically disadvantaged groups [2,26,38].

Some limitations are inherent to the study. Given its cross-sectional design, the study was limited to the identification of associations rather than causal relations. In addition, the presence of residual bias cannot be ruled out. The presence of other contextual factors, inherent to the municipalities studied and not contemplated in the analysis, should be investigated in greater depth. Furthermore, the national survey lacked sampling weights, and thus the study in Rio Grande do Sul does not allow population inferences as to the prevalence of some outcomes and age groups [46]. Thus, the functional dentition rate presented in the current study may not be precise. However, this fact probably did not interfere in the associations reported here.

In general, the presence of functional dentition is influenced by both collective and individual factors. Therefore, studies on functional dentition and tooth loss should take the different levels of social structure into account. It is hoped that the study will contribute to the identification of priority municipalities and groups of individuals for the formulation and implementation of public policies in oral health based on the principles of the Unified National Health System (SUS), aimed at improving the population's quality of life.


## Resumo

*Uma dentição funcional possui importante papel na manutenção da capacidade mastigatória a qual está intimamente relacionada com o número de dentes presentes na boca. O objetivo deste estudo foi investigar a associação entre aspectos individuais e contextuais na dentição funcional (definida como a presença de 20 dentes ou mais na boca) de adultos do Sul do Brasil. O delineamento era transversal de base populacional em dois níveis: 10.407 indivíduos aninhados em 84 municípios. As exposições em ambos os níveis eram socioeconômicas, demográficas e relacionadas. A análise multivariável demonstrou que maiores prevalências (p < 0,01) de dentição funcional foram encontradas em municípios mais ricos e nos com fluoretação da água de abastecimento público, e em indivíduos da zona urbana, naqueles com alta renda, alta escolaridade, nos adultos jovens, homens e naqueles relatando visita ao dentista no último ano e acesso a informações preventivas. Os resultados sugerem que diferentes níveis de estrutura social devem ser considerados em pesquisas sobre perda dentária e dentição funcional.*


*Perda de Dente; Saúde Bucal; Fatores Socioeconômicos*

## Contributors

A. P. Koltermann conceived the study, reviewed the literature, collected the secondary data, and wrote the manuscript. M. P. Pattussi participated in the study's theoretical design and oriented the study and the data analysis and interpretation. J. M. A. Giordani assisted in the research, organization of the database, and literature review. All the authors reviewed the manuscript.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