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ORIGINAL ARTICLE

Factors associated with caries: a survey of students from southern Brazil

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Abstract

Objective: To describe the factors associated with dental caries among students from Santa Cruz do Sul, Rio Grande do Sul, Brazil.

Methods: A cross-sectional study was conducted in a random sample of 623 students of both genders, aged 10–17 years old. Tooth decay was performed using the index of the World Health Organization (1997), DMFT (permanent dentition) that expresses the sum of decayed, missing and filled teeth per person. The maternal educational level was rated using criteria of the Brazilian Association of Market Research Companies. The remaining variables were obtained by a structured questionnaire. Poisson regression analysis was used to test the association between variables using robust models and a subsequently adjusted model. Data were expressed as prevalence ratio (PR).

Results: Multivariate analysis identified the following factors related to the experience of dental caries: residence in rural municipalities (PR: 1.15; 95%CI: 1.0–1.3), attending a city school (PR: 3.30; 95%CI: 1.1–9.4) or a state school (PR: 3.40; 95%CI: 1.1–9.6); and having an illiterate mother or a mother that only attended up to the 4th year of school (PR: 1.67; 95%CI: 1.1–2.4) or high school (PR: 1.54; 95%CI: 1.1–2.2).

Conclusions: The presence of caries in students in southern Brazil was associated with residence in rural areas, mother with little education and attendance to a public school.

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Fatores associados à cárie: pesquisa de estudantes do sul do Brasil

Resumo

Objetivo: Descrever os fatores associados à cárie dentária em escolares de Santa Cruz do Sul, Rio Grande do Sul, Brasil.

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Métodos: Um estudo transversal foi realizado em uma amostra aleatória de 623 estudantes de ambos os sexos, com idade entre 10 a 17 anos. A cárie dentária foi avaliada utilizando-se o índice da Organização Mundial da Saúde (1997), CPO-D (dentição permanente) que constitui a soma de dentes cariados, perdidos e obturados por pessoa. A escolaridade materna foi avaliada utilizando-se os critérios da Associação Brasileira de Empresas de Pesquisa de Mercado. As demais variáveis foram obtidas através de um questionário estruturado. A análise de regressão de Poisson foi utilizada para testar a associação entre as variáveis, utilizando-se modelos robustos e um modelo ajustado posteriormente. Os dados foram expressos como razão de prevalência (RP).

Resultados: A análise multivariada identificou os seguintes fatores relacionados à experiência de cárie dentária: residência em municípios rurais (RP: 1,15; IC95%: 1,0-1,3), frequentar uma escola municipal (RP: 3,30; IC95%: 1,1-9,4) ou estadual (RP: 3,40; IC 95%: 1,1-9,6); e ter uma mãe analfabeta ou uma mãe que só concluiu até a 4ª série do Ensino Fundamental (RP: 1,67; IC95%: 1,1-2,4) ou o ensino médio (RP: 1,54; IC95%: 1,1-2,2).

Conclusões: A presença de cárie em alunos no sul do Brasil foi associada com residência em áreas rurais, mãe com baixo nível educacional e frequentar escola pública.

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Introduction

According to the World Health Organization (WHO), the prevalence of dental caries among schoolchildren is 90% in some countries.¹ In Brazil, the prevalence in children is 53.4% and in adolescents, 56.5%.² Dental caries is one of the most researched oral diseases^{3,4} and results from a chronic process that occurs after a certain amount of exposure to a cariogenic diet and to tooth-susceptible microorganisms. Caries is considered a multifactorial condition that is transmitted locally and is one of the most prevalent pathologies in childhood.^{5,6}

Risk factors for dental caries include salivary flow and composition, cariogenic bacteria present, inadequate fluoride exposure, immune components and genetic factors.⁷⁻⁹ However, other factors, such as lifestyle, behavior, hygiene, eating habits, social status and sociodemographic factors, also contribute to the evolution of caries.^{6,10-12} Oral diseases affect daily activities; among these activities, increased absenteeism¹³ and decreased performance at school and work have widespread economic and psychological impacts and can lead to significant reductions in individual quality of life.^{14,15} In this context, this study aimed to describe factors associated with caries among students in Santa Cruz do Sul, Rio Grande do Sul, Brazil.

Method

A cross-sectional study of 623 students of both sexes, aged 10–17 years old, was conducted from April to December 2012. The sample consisted of students from public and private schools in the city of Santa Cruz do Sul, Rio Grande do Sul, Brazil.

Santa Cruz do Sul has a population of 118,374,000 inhabitants, according to the census of the Brazilian Institute of Geography and Statistics (IBGE).¹⁶ In the urban area of the municipality there are 105,190,000 inhabitants, and in the

rural area, 13,184,000 inhabitants. The Human Development Index (HDI) is 0.773. The city currently has 99% of households served by drinking water with adequate fluoridation. The municipality has 64 establishments of the Unified Health System (SUS), 12 Basic Health Units (UBS) (4 in the rural area and 8 in the urban area) and, among them, six have Surgeon Dentists. Ten teams are dedicated to the Family Health Strategy (1 in the rural area and 9 in the urban area) and four of them have oral health team. In 2012, 14,899 registrations were made in primary education (1751 in private schools, in 6958 city public schools, and 6190 in state public schools). In high school, there were 4010 registrations (765 in private schools and 3245 in public schools).¹⁷

The reference population for the study consisted of approximately 20,540 students in primary and high schools in the public and private school network of the city of Santa Cruz do Sul, stratified by rural vs. urban areas and, further, by center and periphery: north, south, east or west. The city has a total of 69 schools: eight are private schools, all of them located in the urban area, 30 are city schools and 31 municipal schools. In the rural area, there are six state schools and 16 city schools.¹⁷ In order to calculate the sample size, Epi-Info program (Centers for Disease Control and Prevention, Atlanta, GA, USA, version 7) was used. The prevalence of tooth decay used for the calculation was 56%,² with 80% power and a standard error of 5%. Based on these parameters, the minimum required sample size was 362 students. When the confounding variables were added to control the effect by 20% and 20% for losses and refusals, the required sample was 522 students.

The inclusion criteria were: informed consent form signed by a parent/guardian; the adolescent was willing and able to conduct an examination of the oral cavity; the adolescent was properly enrolled in the school, and the adolescent was within the age range of 10–17 years. Both genders were included in the study. The adolescents were excluded from the study if they were absent from school at the time of the oral health evaluation or if they did

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