

Contribution of cohort studies in the analysis of oral health in children and adolescents in Sobral, Ceará

Contribuição de estudos de coortes na análise da condição de saúde bucal de crianças e adolescentes em Sobral, Ceará

Luiz Roberto Augusto Noro^I, Angelo Giuseppe Roncalli^I, Ana Karine Macedo Teixeira^I

ABSTRACT: The main objective of this study was to identify the oral health status of the child population in a northeastern Brazilian municipality as a strategy to carry out subsequent longitudinal studies to investigate the main determinants of oral diseases in the specific age groups of teenagers and young adults. Epidemiological investigations and interviews were conducted in households by research teams. In the first study, a DMFT (decayed, missing, and filled teeth) score of 1.66 was found for 9-year-olds; although only 23% children aged between 5 and 6 years were caries-free, 32.7% had gingival bleeding and 9.5% were diagnosed with severe malocclusion problems. The second wave of the cohort indicated that the incidence of caries increased progressively according to age, from 1.60 in 12-year-old adolescents to 2.28 in those aged 15. Toothache in the past 6 months, maternal income and school meals, adjusted for the perception of need for treatment, maternal education, and dental visit at least once were the variables associated with high incidence of dental caries. Data collection for the third wave of the cohort is currently underway. Socioeconomic factors and access to health services were associated with the incidence of caries.

Keywords: Epidemiologic studies. Cohort studies. Incidence. Adolescent. Oral health. Dental caries.

^ISchool of Dentistry and Graduate Program in Public Health, *Universidade Federal do Rio Grande do Norte* – Natal (RN), Brazil.

^{II}*Universidade Federal do Ceará* – Sobral (CE); and Graduate Program in Public Health, *Universidade Federal do Rio Grande do Norte* – Natal (RN), Brazil.

Corresponding author: Luiz Roberto Augusto Noro, Universidade Federal do Rio Grande do Norte, Centro de Ciências da Saúde, Avenida Salgado Filho, 1787, Lagoa Nova, CEP: 59056-000, Natal, RN, Brazil. E-mail: luiz_noro@hotmail.com

Conflict of interests: nothing to declare – **Financial support:** none.

RESUMO: O objetivo do presente estudo foi identificar as condições de saúde bucal de população infantil em município do Nordeste brasileiro e, a partir dessa identificação, realizar estudos longitudinais para relacionar os principais determinantes no desenvolvimento de doenças bucais em faixas etárias correspondentes a adolescentes e adultos jovens. Foram realizados exames epidemiológicos e entrevistas em ambiente domiciliar, com equipes de pesquisadores. No primeiro estudo, observou-se CPO-D aos 9 anos de 1,66 e apenas 23% das crianças entre 5 e 6 anos de idade livres de cárie; 32,7% das crianças apresentavam sangramento gengival e em 9,5% das crianças foram diagnosticados problemas severos de maloclusão. A segunda onda da coorte sinalizou que a incidência de cárie aumentou progressivamente com a idade, passando de 1,60 nos adolescentes com 12 anos de idade para atingir 2,28 naqueles com 15 anos. Dor de dente nos últimos 6 meses, renda da mãe e merenda escolar, ajustadas por percepção sobre necessidade de tratamento, escolaridade da mãe e consulta ao dentista ao menos uma vez, foram as variáveis que apresentaram relação com a alta incidência de cárie. Atualmente, está sendo realizada a coleta de dados para a terceira onda da coorte. Fatores socioeconômicos e de acesso aos serviços de saúde apresentaram relação com a incidência de cárie.

Palavras-chave: Estudos epidemiológicos. Estudos de coortes. Incidência. Adolescente. Saúde bucal. Cárie dentária.

The model of organized health care of the municipality of Sobral, Ceará, Brazil, was based on the principles of the Unified Health System, from interdisciplinary and multiprofessional actions, with its foundations built on strategies such as the Family Health Strategy¹. The oral health teams were included in the Family Health Strategy from 1998, facing the challenge of working with a focus on health promotion and effective participation of oral health professionals². To enable the paradigm conceived from this construction, the appropriation of epidemiological information was essential to allow a new targeting of the oral health actions in the municipality.

Envisioning such possibility, and counting on the development of the “Study on health conditions, education and quality of life for children aged 5 to 9 years living in the city of Sobral – Ceará³”, an epidemiological survey on oral health in a sample of participants from the study was proposed.

The initial research studied the population of children aged 5 to 9 years, residing in the urban area of Sobral, estimated at 18,668 children, for a total population estimated at 143,565 inhabitants in the year 2000. Taking the prevalence of 10% between the various situations predicted as a reference, and considering a 10% margin of error and a confidence level of 95%, the final number was found, adjusted for finite populations, to be 2,900 children. However, considering the operational capacity available for the study, the final sample used for morbidity analysis included 3,276 children, accounting for 17.54% of the population in the age group of 5 – 9 years⁴.

Considering a prevalence of 30% (due to the malocclusion), a 10% margin of error, and confidence level of 95%, the sample size for the epidemiological survey on oral health would be 710 children. However, as the study was envisioned to continue from the perspective of a cohort study, the authors chose to work with a sample of 1,021 children⁵.

Six years after the development of this first study, the second wave of the study cohort was carried out through oral examinations to identify the incidence of dental caries in adolescents (11 to 15 years) of the municipality of Sobral⁶.

Researchers participated in technical training for the definition of standards, and, through consensus among the technical examiners, calibration was carried out, and a Kappa coefficient that ranged from 0.86 to 0.96 was obtained. Data were collected by seven teams of dentists (examiners) and oral health assistants (note taker), professionals of the Department of Health of the municipality of Sobral.

To form the sample of the follow-up study, an active search of 1,021 individuals residing in the urban area of the municipality of Sobral, who had been examined in the years 1999/2000, at that time, aged between 5 and 9 years, was carried out. The examiners visited all households, based on the report of an examination carried out preliminarily. The criteria proposed by the World Health Organization (WHO) for epidemiological surveys in oral health were used for the examinations⁷. After the visits, 688 teenagers were examined, and their legal guardians replied to the questionnaire with questions concerning their socioeconomic condition, access to actions and services, and self-assessed perception. There was a loss of 34.6% individuals along the cohort.

In 2011, the process of articulation and planning of the third wave of the cohort study on oral health in the municipality of Sobral started, involving researchers at the School of Dentistry of Universidade Federal do Ceará (UFC, Sobral) and the Graduate Program in Public Health at Universidade Federal do Rio Grande do Norte.

The study population included, therefore, 688 young people aged between 17 and 21 years, who were examined in 1999–2000 and in 2006. The active search of these teenagers and young adults was being carried out by seven teams of Dentistry students duly qualified and calibrated, composed by examiner, note taker and interviewer, under the supervision of researchers involved in the project.

Considering the difficulties, other active search methods were conducted to lessen possible losses in the study, such as the use of social networking (Internet), workplaces, and registrations with various institutions.

The initial study, conducted between 1999 and 2000, allowed an overview of the oral health condition of children in this age group in the municipality of Sobral, pointing to a DMFT (decayed, missing, and filled teeth) score of 1.66 at the age of 9, whereas only 23% children aged between 5 and 6 years old were free of dental caries. Regarding gingival changes, on average, 32.7% children presented gingival bleeding; as for malocclusions, it was observed that 30.17% had mild problems and 9.5% had severe problems.

From the longitudinal study conducted in 2006, the incidence of caries was found to increase progressively with age, rising from 1.60 (SD = 1.97) in adolescents aged 12 to 2.28 (SD = 2.45) in those aged 15. Among the variables studied, toothache in the past 6 months, maternal income and school meals, adjusted for the perception of the need for treatment, education, and dental consultation at least once were the variables that were associated with high incidence of dental caries from the Poisson regression. Socioeconomic variables relating to access to services were associated with incidence of caries.

The home-based research should foresee the effective participation of community health workers, who greatly facilitate the development of the work and, in some situations, it is the only way to effectively facilitate the various stages of the research, due to the trust the population has in this professional.

The big challenge for longitudinal studies includes the control of the population studied, particularly at the present time, when many young people change their address or town in search of employment or studies. Strategies for monitoring the subjects need to be enhanced for the viability of future segments. In this study, socioeconomic factors and those relating to access to health services were found to be associated with incidence of caries, which shows the presence of inequalities in oral health in the municipality under study.

REFERENCES

1. Andrade LOM, Barreto ICHC, Goya N, Martins Júnior T. Organização da atenção básica e estratégia saúde da família em Sobral-Ceará-Brasil: principais avanços e desafios na perspectiva de produzir mudanças positivas na saúde. In: Suassuna A, Fernandes J, Seclen-Palacin A. (org.). Experiências e desafios da atenção básica e saúde familiar: caso Brasil. Brasília: Organização Pan-americana da Saúde; 2004.
2. Teixeira AH, Bezerra MM, Pinto VPT. Saúde bucal na estratégia Saúde da Família: conhecendo a atuação das equipes em Sobral, CE. SANARE 2005; 6(1): 9-18.
3. Sucupira ACSL. O fracasso escolar e condições de vida em crianças de 7 a 10 anos e idade, Sobral - CE [tese de doutorado]. São Paulo: Faculdade de Medicina da USP; 2003.
4. Barreto ICHC, Grisi SJFE. Morbidade referida e seus condicionantes em crianças de 5 a 9 anos em Sobral, CE, Brasil. Rev Bras Epidemiol 2010; 13(1): 35-48.
5. Noro LRA, Roncalli AG, Mendes Júnior FIR, Lima KC. Children oral health status from Sobral – Ceará. STOMA 2008; 88: 4-8.
6. Noro LRA, Roncalli AG, Mendes Júnior FIR, Lima KC. Incidência de cárie dentária em adolescentes em município do Nordeste brasileiro, 2006. Cad Saúde Pública 2009; 25(4): 783-790.
7. WORLD HEALTH ORGANIZATION (WHO). Oral health surveys: basic methods. 4. ed. Geneva, 1997. 66p.

Received on: 11/13/2013

Final version presented on: 04/09/2014

Approved on: 04/10/2014