

Oral health status and functional capacity in the elderly: a longitudinal population-based study

Condições de saúde bucal e capacidade funcional em idosos: um estudo longitudinal de base populacional

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ABSTRACT: *Introduction:* The study of oral health conditions and functional dependency in elderly people represents an important step toward the comprehension of the intervenient factors in the health care of this population. *Purpose:* This methodological note described strategies and methods adopted in a longitudinal study which has been analyzing the association of oral health conditions with functional dependence among the elderly population in a city located in the countryside of Northeastern Brazil. *Methodological aspects:* The assessment of the oral health conditions among the subjects is being carried out by an intraoral epidemiological examination, in which the number of decayed teeth, the periodontal condition, the use and need for dental prosthesis, and the presence of modification in soft tissues is being evaluated. Furthermore, an epidemiological condition of temporomandibular dysfunction and xerostomia are being observed. The functional capacity is being evaluated by the Katz index, and the elderly cognitive capacity is being assessed by Mini-Mental State Examination. *Main findings:* The first wave of this cohort, which was conducted in 2010 and 2011, evaluated 441 elderly in a city of the Northeastern Brazil. The mean decayed, missing, and filled teeth (DMFT) index was 28.16 (\pm 5.82), and 50.8% of the elderly were edentulous. Among the individuals from the first wave, 10.4% were dependent in at least one of the activities of daily living. *Future prospects of cohort:* The data collection of second wave is in progress and it is expected that the extensive information collected will contribute to the planning of health actions for this population.

Keywords: Aged. Frail elderly. Oral health. Health of the elderly. Dental care for aged. Cohort studies.

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

RESUMO: *Introdução:* O estudo das condições de saúde bucal em idosos, aliado à busca de uma associação com a sua capacidade funcional, representa um importante passo para auxiliar na compreensão dos fatores intervenientes no cuidado odontológico desses indivíduos. *Objetivo:* Esta nota metodológica descreveu as estratégias e os métodos adotados em um estudo longitudinal que busca a associação entre as condições de saúde bucal e a capacidade funcional em uma população de idosos do interior do Nordeste brasileiro. *Aspectos metodológicos:* A condição de saúde bucal dos idosos dessa coorte tem sido avaliada por meio de um exame epidemiológico intraoral que avalia o grau de ataque de cárie, a condição periodontal, o uso e necessidade de prótese e a presença de lesões. Além disso, coletam-se informações epidemiológicas a respeito da disfunção temporomandibular e xerostomia. A capacidade funcional é avaliada através do índice de Katz, e o estado cognitivo dos idosos é avaliado por meio do miniexame do estado mental. *Principais achados:* A primeira onda da coorte, realizada em 2010/11, avaliou 441 idosos no município de Macaíba (RN). Observou-se que o número de dentes cariados, perdidos e obturados (índice CPO-d) médio foi de 28,16 ($\pm 5,82$) e que o edentulismo esteve presente em 50,8% da amostra. Verificou-se também que 10,4% dos indivíduos da primeira onda eram dependentes em pelo menos umas das atividades de vida diária. *Futuras perspectivas da coorte:* A coleta de dados da segunda onda encontra-se em andamento, e espera-se que o grande número de informações coletadas e acompanhadas nessa coorte contribua para o planejamento de ações em saúde voltadas para essa parcela da população.

Palavras-chave: Idoso. Idoso fragilizado. Saúde bucal. Saúde do idoso. Assistência odontológica para idosos. Estudos de coortes.

INTRODUCTION

The study of oral health status in elderly, in addition to the investigation of its association with their functional capacity, is an important action that may contribute to understanding the factors involved in the dental care of these individuals. Thus, it is understood that the longitudinal assessment of elderly on their oral health conditions and functional dependence is extremely important, considering that monitoring these individuals is the best alternative to explain possible associations between these outcomes.

In this context, this study proposed a longitudinal analysis of the oral health status and dependence in an elderly population, as well as of the potential associations between these dimensions. Therefore, data from the cross-sectional study carried out in 2010 and 2011 in the municipality of Macaíba (RN) were used as baseline. This is therefore the first cohort of elderly selected for the study on the oral health of this population in the countryside of the Northeastern Brazil.

METHODS

This cohort was composed applying the probability sampling technique by conglomerates, which randomly selected a portion representative of the elderly population (aged 60 years and above) of the municipality of Macaíba (RN). This is located in the metropolitan area of Natal — distant 21 km from the capital. According to estimates of the Brazilian

Institute of Geography and Statistics (IBGE) for 2010, the total population of the municipality was 69,467 inhabitants, of whom 6,492 were aged 60 years or more, 2,978 were men, and 3,514 were women, which correspond to 9.3% of elderly residents¹. The baseline project was approved by the Ethics Committee of the *Universidade Federal do Rio Grande do Norte* (UFRN), under the opinion 340/2009. Therefore, data relating to the baseline represented the first wave of observation of this longitudinal study.

When testing the hypothesis that functionally dependent individuals have higher risk of oral health impairment, the calculation of sample size, considering a beta error of 20% and alpha error of 5%, showed that a sample of 194 individuals from the baseline can provide an odds ratio of 1.5.

In order to recruit the elderly of the sample, urban blocks and rural villages were previously drawn from certain census tracts. Of the 65 census tracts of the city of Macaíba, 52 were eligible. Of these, 30 were selected because they represented an optimal and operationally feasible number, which could enable appropriate dispersion of data and avoid a biased sample that did not represent the whole population.

RESULTS

The baseline study identified 466 eligible elderly in the municipality of Macaíba (RN). Of these, 441 individuals were selected to compose the final sample (94.6% response rate), of which 68.3% were female. The mean age was 71.7 (\pm 8.7) years; the mean schooling was 2.17 (\pm 2.74) years; and monthly family income averaged 2.0 (\pm 1.19) minimum wages. With regard to oral health variables, the mean decayed, missing, and filled teeth (DMFT) index was 28.16 (\pm 5.82), with greater influence of the “missing” component of the index, as 50.8% of elderly in the sample were edentulous². Such data are similar to those observed in the 2010 National Survey on Oral Health (SB Brasil 2010) for the Brazilian Northeast region³. The dependent and independent variables of the baseline study are found in Chart 1 and were collected based on the *SB Brasil 2010* questionnaire³, except for the variable related to the functional capacity, which was obtained by means of the Katz index⁴.

When considering the data on functional capacity, the baseline study found a prevalence of 10.4% of dependent individuals in at least one activity of daily living, whereas in a population base study carried out in a small city of the Northeast Brazil, this prevalence was 13.5%⁵. However, associations of functional capacity with oral health variables observed at the baseline were not found, which demonstrates that such outcomes may occur at different stages of the elderly's life, and therefore justifies the monitoring of people who have these characteristics.

OUTLOOK OF THE COHORT

In the second wave of the cohort initiated in 2015, the subjects of the first wave are being examined and interviewed again. However, new subjects are being included in the sample,

representing individuals who were aged less than 60 years in the first wave and now are in the age range from 60 to 65 years. This new wave was approved by the Research Ethics Committee of UFRN, under the opinion 031704/2015.

The procedures being performed for data collection include the application of a questionnaire including sociodemographic questions and the evaluation of the individual functional capacity. In addition, an epidemiological examination to evaluate the oral health status of the elderly is being carried out. Therefore, DMFT is used to measure the degree of caries attack, and community periodontal index (CPI) and periodontal attachment loss index (PALI) are used to assess periodontal condition of the individual. The CPI was adopted owing to its simplicity of application and international uniformity, but its findings should be interpreted with caution, as this index has limitations owing to the partial clinical examination, which exclude signs of previous periodontal disease and any activity marker or susceptibility to the disease^{6,7}.

For the realization of the second wave, collecting a larger number of variables related to oral health, functional capacity, and cognitive status of elderly is fundamental. Thus, information concerning the occlusal pairs⁸, the simplified questionnaire for screening

Chart 1. Variables of the baseline study (2010/2011) of the cohort of oral health status and functional capacity in elderly. Macaíba, RN, 2015.

Dependent variables	
Root surface caries	Periodontal attachment loss
Gingival bleeding	Use of dental prosthesis
Dental calculus	Dental prosthesis required
Periodontal pockets	Edentulism
Main independent variable	
Functional capacity – Katz index	
Independent control variables	
Gender	Current tobacco consumption
Age	History of tobacco consumption
Educational level	Current alcohol consumption
Marital status	History of alcohol consumption
Monthly family income	Time elapsed since the last visit to the dentist
Caregiver presence	Service type sought on the last visit
Number of people in household	Loyalty to service sought
Government benefit type	Diseases referred
Monthly spending in medicine	Occurrence of recent fall
Receiving retirement benefit	Occurrence of bone fracture with more than 60 years of age

of temporomandibular dysfunction (QST/TMD⁹), and xerostomia questionnaire for detection of hyposalivation¹⁰ were added to the instrument of the study. The need to evaluate the functional capacity to perform the instrumental activities of daily living (IADL)¹¹ is also being observed. The assessment of cognitive status was also added to the data collection instrument by means of the Mini Mental State Examination (MMSE), as this variable is an important risk factor for the decline in functional capacity¹².

Owing to the large number of oral health variables that are being collected by this study, various associations can be made using the same database. Therefore, it is expected that this cohort will enable several research initiatives, which taken together can contribute further to the understanding of the factors involved in the health care to these individuals. However, it is fundamental to investigate other elderly populations, as the elderly studied have homogeneous sociodemographic characteristics, which limits the inference of such data to populations inserted in different social contexts.

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Received on: 10/07/2015

Final version presented on: 05/13/2016

Accepted on: 06/28/2016