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Factors related to unmet oral health needs in older adults living in Chile☆

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ABSTRACT

To assess the oral health status and treatment needs of an ambulant population of older adults, living in the Maule Region, Chile, and provide descriptive information on its distribution by selected socio-demographic characteristics. The source of primary data was the Regional Oral Health Survey. A stratified random sample of 438 older adults, aged 65–74 years, living independently in the community was orally examined, and underwent an oral health interview. The sample was largely a dentate one (74.9%); with a mean DMFT score of 25.7 (s.d. 6.5) and an average number of missing teeth of 22.4 (s.d. 5.8). Dentate participants had 41% of their restorative care needs unmet, and 68.4% needed oral hygiene instruction plus removal of calculus on their teeth. Almost 30.1% required complex periodontal therapy. 21% of those fully edentulous were in need of full dentures. Comparing these findings with existing data on the oral health of older adults in Chile, participants in this study appear to have lower missing teeth scores and less need for complex periodontal treatment. Inequities were apparent in the proportion of unmet restorative and prosthetics needs. Community-based preventive care programs specifically tailored to older adults are needed to address this challenge.

1. Introduction

In 2002, 11.4% of the Chilean population was aged 60 years or older (Instituto Nacional de Esadisticas, 2003). Consistent with this global trend, demographic data show that over the next two decades Chile will have the largest number of older adults in its history (Vio & Albala, 2000). By 2035, this group is expected to represent almost 18% of the population. Also, consistent with a global trend towards retaining natural teeth in old age, Chile has experienced an epidemiological transition in oral health with a reduction in the prevalence of edentulism, as documented in other national studies, regional (Mariño, Cueto, Badenier, Acevedo, & Moya, 2011), and self-reported data (Mariño, Albala, Sanchez, Cea, & Fuentes, 2013). Still, compared to other countries, the proportion of edentulous continues to be high (Australian Institute of Health and Welfare, 2013; National Institute of Craniofacial and Dental Research, 2013).

The increase in the extent and impact of longevity will have an effect on the patterns and presentations of illness, disease, and disability and poses challenges to both the community and the government. An increased retention of natural teeth means more adults at risk of dental caries (coronal and root), and the complexity of these restorations may require additional skills, as well as involving medical considerations when treating older adults. Health care providers, the health industry and policy makers in Chile will need to urgently assess their own preparedness, including research agendas and investment strategies, to meet the demands of older adult health over the next decades.

In 2007, the Chilean government introduced the Explicit Health Guarantee (GES) for those 60-years and older to ensure that their access to health is not related to their ability to pay. Some oral health conditions, such as tooth loss and dental emergencies (Ministerio de Salud, 2007), are covered by GES. Optimal use of these funds needs development and implementation of cost-effective, sustainable and equitable strategies that integrate population oral health promotion and disease prevention activities, and translate these into evidence informed practice. In order to effectively deliver oral health care to the communities with pertinent programs, a key starting point is to know the oral health status of the target population.

Epidemiological studies and public health priorities have focused on younger cohorts in Chile, leaving the oral health

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information of older cohorts mainly limited to coronal caries (Ministerio de Salud de Chile, 2003). In relation to oral health, although some recent data exist for particular age groups, such as 12 years of age (Ministerio de Salud, 2008). There is a lack of information available about the dental status at the regional and local level, in particular the adult population. These gaps in knowledge represent a serious limitation, which precludes the development of regional programs to address inequities in health. A better understanding of the oral health status of older adults living in regional areas will need to be met with different health strategies including primary, secondary, and tertiary prevention, to ensure an effective approach in promoting oral health.

Consequently, this paper focuses on an ambulant population of older adults (65–74 years old) from rural and urban areas of the Chilean Maule Region and aims to describe the oral health status (dental caries and periodontal disease), and wearing of, need for and condition of dental prostheses, and on its distribution by selected socio-demographic characteristics (such as age, gender, education). The paper also estimates restorative, periodontal, and prosthetic treatment needs in this population.

2. Methods

A community-based cross-sectional survey was conducted to investigate unmet oral health needs, and factors affecting unmet needs in the Chilean Maule Region. Chile is divided administratively into 15 Regions. The Maule Region is located some 250 km south of Santiago. This region is home to the fourth largest population of Chile. The Maule Region has worse health indicators than the rest of the country (Ministerio de Salud, 2008). A stratified, multi-stage sampling design, with selection proportional to population size, was the method of choice to ensure that the participants were from fluoridated as well as non-fluoridated areas of the Region. In the first stage, municipalities (primary sampling unit) classified as urban or rural, were randomly selected from each strata, according to population size. In the second stage, individuals (secondary sampling unit) participating in third age clubs were selected within each municipality, through a systematic random selection procedure.

2.1. Setting

Following approval from the University of Talca Bioethics Committee, older adults' social clubs were selected at random and their members invited to participate in the study.

The appropriate sample size for this population-based study was determined considering the sample size necessary to be 95% confident of estimating the mean dental caries in this population to be within 3.5% of the true value. Calculations were based on reported data on dental caries history (DMFT = 21.6; s.d. 5.7) mean in older adults in Chile (Mariño et al., 2011). Additionally, a design effect of 2 was used. It was assumed that the between clubs variance was of a rather smaller magnitude than the inter-individuals (Lemeshow, 1990). Hence, a sample of 437 older adults would be necessary.

Once individual written consent was obtained, volunteers were asked to undergo a structured interview and a clinical examination. Interviews and dental examinations were conducted at the community health centres' facilities using overhead light, dental mirrors and Community Periodontal Index probes (World Health Organization, 1997). Clinical data were recorded following World Health Organization (WHO) criteria and recommendations for oral health data collection (World Health Organization, 1997). Participants with specific medical conditions such as heart disease, bleeding disorders and anticoagulant therapy were excluded from the periodontal examination. Dental forms, instruments and procedures were standardized according to the WHO guidelines. Data collection extended from March 2011 to October 2011.

A team of four examiners received training and calibration in making clinical measurements. Examiners were trained in the application of the oral examination criteria. Intra- and inter-examiner reliability was checked using Cohen's Kappa statistics. Inter- and intra-examiner reliabilities were assessed by the repetition of exams on 28 individuals by each examiner. In both cases kappa statistics were higher than 0.90, which indicates an almost perfect level of agreement.

2.2. Measures

Clinical data were derived from dental examinations conducted by calibrated oral health professionals. No radiographs were used. Five clinical measures of oral health status: DMFT, DMFS, CPI, Loss of Attachment, and PI were used.

2.2.1. Coronal dental caries assessment

This information allowed for the calculation of the decayed, missing, and filled surface (DMFS); decayed, missing and filled teeth (DMFT) indices and its components [e.g., decayed surface (DS), and filled surface (FS)]. Number of natural teeth was divided into four groups: 'no teeth', '1–10 teeth', '11–20 teeth', and 'more than 20'. To further explore dental health status, the dental caries assessment included the proportion of unmet restorative needs. To measure restorative needs, the "restorative unmet normative needs" index was computed by dividing the sum of carious surfaces by the total number of carious and filled surfaces: [DS/(DS + FS)] (Todd & Gelbier, 1991).

The Community Periodontal Index (CPI) was used to assess periodontal status (World Health Organization, 1997). All index teeth present, and not indicated for extraction, were examined and scored as: no need for care (healthy), bleeding gingiva on gentle probing (bleeding), presence of dental calculus (calculus), presence of 4–5 mm gingival periodontal pockets (shallow pockets), or 6 mm or deeper gingival pockets (deep pockets).

In addition to the CPI, the position of the gingival margin in relation to the cemento-enamel-junction was measured using the WHO methodology. "Loss of attachment," that is, the apical migration of the level of attachment (and hence the level of alveolar bone), is regarded as an invariant destructive component associated with periodontal disease (Goodson, 1990). A score of 0 means an attachment loss of no more than 3 mm. A score of 1 indicated that participants had an attachment loss of between 4 and 5 mm, whereas a score of 2 indicates a loss of between 6 and 8 mm, and 3 means an attachment loss of 9–11 mm, while 4 indicates an attachment loss of 12 mm or more. Thus, scores of 2–4 indicate serious periodontal destruction.

Oral hygiene was estimated using the Plaque Index (PI) (Silness & Loe, 1964). The PI is based on the presence and amount of soft debris deposits on selected teeth. Each of the four surfaces of the teeth (buccal, lingual, mesial and distal) is given a score from 0 to 3. Zero indicates 'No plaque' while a score of 1 indicates that a film of plaque may be seen only after application of disclosing solution or by using the probe on the tooth surface. A score of 2 indicates moderate accumulation of soft deposits within the gingival pocket, or on the tooth and gingival margin, which can be seen with the naked eye. Finally, a score of 3 indicates an abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin.

The prosthetic assessment included determination of the need for, and use of, dental prostheses, and the condition of the appliances used by individuals. Denture possession was recorded for each subject by arch. If the subject presented a denture at the time of the clinical examination, to determine the need for