PREVALENCE AND ASSOCIATIONS OF XEROSTOMIA IN OLDER ADULTS IN SOUTHERN BRAZIL

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1. INTRODUCTION

Xerostomia is defined as the self-reported, subjective feeling of mouth dryness. A systematic review estimated its overall prevalence in adults and older adults at 27.5% (95% CI 21.3 – 33.8) (AGOSTINI *et al.*, 2018), with that higher in older individuals and in females. Indeed, associations with older age and the female sex have been consistently reported (NIKLANDER *et al.*, 2017), most likely due to compromised salivary function and salivary gland size (FLINK *et al.*, 2008). Behavioural factors also shown to be associated with xerostomia include smoking and alcohol consumption. Clinical states, such as wearing dentures (VILLA; ABATI, 2011) or having fewer teeth have been shown to be associated with xerostomia (IKEBE *et al.*, 2011). Xerostomia is also more common among sufferers of chronic conditions such as rheumatoid arthritis (ZALEWSKA *et al.*, 2013), diabetes (LÓPEZ-PINTOR *et al.*, 2016), hypertension (RAMÍREZ *et al.*, 2021) and depression (YAMAMOTO *et al.*, 2018).

A low salivary flow rate is associated with a higher risk for caries, as saliva has a protective effect against several pathogenic microorganisms (HUNTER, 2023). Saliva has a lubricant effect on the oral mucosa and therefore a protective effect against the friction of dental elements, the tongue and the buccal mucosa, especially while eating, which may result in mechanical lesions , difficulty in swallowing, and potentially the avoidance of certain foods (BARBE, 2018; LU *et al.*, 2020). It may also impair speech (PEDERSEN *et al.*, 2018) and, due to the lack of a natural lubricant, interfere in the retention of removable dentures (for which wettability is an important determinant). Given all of these effects, it should come as no surprise that xerostomia sufferers have impaired Oral-Health-Related Quality of Life (OHRQoL) (DIEP *et al.*, 2021).

Most investigations of xerostomia occurrence have been conducted in high income countries (JOHANSSON *et al.*, 2022), with a lack of population-level data from middle- or low-income countries. Thus, the aim of this study was to describe the prevalence of xerostomia and its associated factors in community-dwelling older adults living in the urban area of Pelotas, in Southern Brazil.

2. METHODS

This cross-sectional study was carried out from January to August 2014, with the older adult population of Pelotas, in Southern Brazil. Adults of 60 years or more who were residing in the urban zone of Pelotas were eligible for the study. Excluded from the sample were those who were institutionalized, imprisoned or not able to answer the questionnaire (whether by themselves or with help). A total of 1451 participants were interviewed in their homes using a standardized questionnaire about demographic and socioeconomic characteristics and general and oral health.

The dependent variable was xerostomia, evaluated using the single question: *"Have you had the feeling of dry mouth in the past six months?"*, with yes or no as the possible answers. Independent variables included dentition status, sex, income, schooling, alcohol and tobacco usage, chronic diseases and medication intake.

Descriptive and bivariate analyses used cross-tabulations and Chi-square tests. Ordinal variables were tested with Chi-square for trend regarding xerostomia prevalence. Unadjusted and adjusted prevalence ratios were obtained through Poisson regression with robust variance estimation. Multivariate analysis was conducted using hierarchical backwards elimination with a set significance level of $p<0.2$ for remaining in the model. All statistical analyses were performed with STATA 15.1.

3. RESULTS AND DISCUSSION

Of the 1451, 53 (3.6%) were missing xerostomia data and were omitted, leaving a final sample of 1398 older adults. More than one in three participants had experienced xerostomia in the previous six months, with a significantly higher prevalence in the bivariate analysis between those who were female; less schooled; of lower economic strata; presented depression symptoms; had diabetes or arthritis and those who took 4 or more medications in the last 15 days. A lower prevalence of xerostomia was observed in current smokers and those who were reported drinking alcoholic beverages in the last 30 days.

The table at the end of this section presents the unadjusted and adjusted prevalence ratios for xerostomia. In the hierarchical multivariate Poisson regression analysis, most of the covariates lost statistical significance. Sex remained so, with females and less educated people having a higher prevalence ratio. Depression and arthritis were also associated with it, as was polypharmacy.

Our findings indicate a strong association of xerostomia and sex and general health conditions such as arthritis and depression, as well as an association to lower schooling and polypharmacy. A relatively high prevalence of xerostomia was observed in the older adult population of Pelotas.

Table 1. Unadjusted and adjusted prevalence ratios for xerostomia.

Covariates	Total N (%)	Unadjusted		Adjusted	
		PR (95% CI)	P*	PR (95% CI)	P*
Sex			**<0.001**		**0.001**
Male	513 (36.7)	1.00		1.00	
Female	885 (63.3)	1.74 (1.43 – 2.13)		1.44 (1.17 – 1.79)	
Age (years)			0.079		0.356
60 to 69	744 (53.4)	1.00		1.00	
70 to 79	45 (31.9)	1.09 (0.89 – 1.32)		1.04 (0.85 – 1.26)	
80 or more	205 (14.7)	1.24 (0.98 – 1.58)		1.13 (0.88 – 1.44)	
SES†			**0.047**		0.792
High	462 (35.0)	1.00		1.00	
Medium	700 (53.0)	1.24 (1.02 – 1.51)		1.06 (0.85 – 1.32)	
Low	159 (12.0)	1.26 (0.94 – 1.68)		1.03 (0.75 – 1.41)	
Schooling			**0.001**		**0.015**
8 years or more	450 (32.5)	1.00		1.00	
Up to 8 years	757 (54.7)	1.40 (1.15 – 1.71)		1.31 (1.05 – 1.63)	

Smoking			**0.021**		0.405
Nonsmokers	751 (53.8)	1.00		1.00	
Former smokers	465 (33.3)	0.90 (0.74 – 1.09)		1.09 (0.90 – 1.35)	
Smokers	179 (12.8)	0.71 (0.52 – 0.95)		0.80 (0.59 – 1.08)	
Alcohol use (last 30 days)			**0.005**		0.205
No	1087 (78.0)	1.00		1.00	
Yes	306 (22.0)	0.72 (0.57 – 0.90)		0.86 (0.67 – 1.09)	
Polypharmacy			**<0.001**		**0.035**
No	717 (51.6)	1.00		1.00	
Yes	672 (48.4)	1.45 (1.21 – 1.73)		1.22 (1.01 – 1.46)	
Hypertension			0.128		0.870
No	461 (33.1)	1.00		1.00	
Yes	934 (66.9)	1.16 (0.96 – 1.40)		1.02 (0.84 – 1.24)	
Diabetes			**0.019**		0.309
No	1067 (74.5)	1.00		1.00	
Yes	328 (23.5)	1.26 (1.04 – 1.53)		1.10 (0.90 – 1.35)	
Arthritis			**<0.001**		**<0.001**
No	817 (58.6)	1.00		1.00	
Yes	577 (41.4)	1.67 (1.40 – 1.99)		1.42 (1.18 – 1.71)	
Depression			**<0.001**		**0.001**
No	1171 (85.0)	1.00		1.00	
Yes	207 (15.0)	1.71 (1.39 – 2.10)		1.45 (1.18 – 1.79)	
Dentition (teeth)			**<0.001**		0.179
21 or more	247 (17.7)	1.00		1.00	
10 to 20	316 (22.6)	1.27 (0.92 – 1.73)		1.02 (0.73 – 1.41)	
1 to 9	301 (21.5)	1.59 (1.17 – 2.15)		1.25 (0.90 – 1.73)	
Edentulous	534 (38.2)	1.66 (1.26 – 2.19)		1.18 (0.87 – 1.61)	

*Poisson regression. P-values of ordinal variables for linear trend.
†Socioeconomic status.

4. CONCLUSIONS

Our study sheds some light on a particularly neglected subject. While tooth decay, periodontal disease, and tooth loss are frequently investigated, there is a relatively small literature on xerostomia prevalence and associated factors, especially in population studies and in older adults. A condition is considered a public health problem when it has a high prevalence, affects the life of the individuals, and has a financial burden for the individual or the health system. The high prevalence of xerostomia observed in the older adults from this cohort, together with the potential impact in the oral health related quality of life, and the association between xerostomia with systemic disease, should reinforce the need for additional studies investigating this condition and its causes, in order to reduce the potential adverse effects caused by the dry mouth.

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