ORIGINAL ARTICLE

Use and need of dental prosthesis among community dwelling elderly: a cross-sectional population-based study

Uso e necessidade de próteses dentárias em idosos domiciliados: um estudo transversal de base populacional

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Abstract

Background: By the use of complete or partial dental prosthesis, function, esthetics, and phonetics are reestablished. Few population-based studies are available in the literature using an older adult population. **Objective:** Evaluate the use of and need for dental prostheses and their associated factors. **Method:** This study included a random sample of 287 elderly, in the city of Cruz Alta, Brazil. Use of and need for dental prostheses were the main outcomes, and two analytical models were constructed. Subgroup analyses were performed for individuals using fixed partial denture (FPD) and removable (partial and/or complete) dental prosthesis (RDP). **Results:** Use of and need for dental prosthesis were identified in 83.6% (n=240) and 42.5% (n=122) of the elderly, respectively. Women presented a significantly higher prevalence ratio (PR) for use of dental prostheses (PR=1.15; 95%IC:1.02–1.28) and lower need (PR=0.70; 95%IC:0.54–0.91). No statistically significant difference was demonstrated for the use of FPD regarding the sex. Higher education level was associated with lower use of prostheses (PR=0.73; 95%IC:0.58–0.91) when compared to lower level of education. Medium level of education showed a significantly lower need for dental prostheses (PR=0.61 – 95%IC:0.39–0.94). Those that did not consume alcohol presented with a significantly lower use of FPD and RDP (PR=0.46; 95%IC:0.23–0.93 and 0.90;0.81–0.99, respectively). **Conclusion:** The use of and need for dental prostheses were associated with sex, level of education, and behavioral factors.

Keywords: dental prosthesis; tooth loss; aging; risk factors.

Resumo

Introdução: Pelo uso de próteses dentárias completas ou parciais, função, estética e fonética são reestabelecidas. Poucos estudos de base população estão disponíveis na literatura utilizando a população idosa. **Objetivo:** Avaliar o uso e a necessidade de prótese dentária, bem como seus fatores associados. **Método:** Esse estudo incluiu uma amostra randômica de 287 idosos da cidade de Cruz Alta, no Brasil. Uso e necessidade de prótese dentária foram os desfechos primários, e dois modelos analíticos foram construídos. No uso de prótese dentária, análises de subgrupos foram realizadas para Prótese Parcial Fixa (PPF) e Prótese Removível (parcial e/ou completa) (PR). **Resultados:** Uso e necessidade de prótese

dentária foram detectados em 83,6% (n=240) e 42,5% (n=122) dos idosos, respectivamente. Mulheres apresentaram significativa maior Razão de Prevalência (RP) para o uso de prótese dentária (RP:1,15; IC95%:1,02–1,28) e menor necessidade (RP:0,70; IC95%:0,54–0,91). Nenhuma associação significativa foi encontrada para o uso de PPF em relação aos gêneros. Alto nível educacional esteve associado ao menor uso de prótese (RP:0,73; IC95%:0,58–0,91), quando comparado com escolaridade baixa. Escolaridade média mostrou significativa menor necessidade de prótese dentária (RP:0,61 – IC95%:0,39–0,94). Aqueles que não utilizam álcool apresentaram um menor uso de PPF e PR (RP:0,46; IC95%:0,23–0,93 e 0,90;0,81–0,99, respectivamente). **Conclusão:** Uso e necessidade de prótese dentária estão associados ao gênero, nível educacional e fatores comportamentais.

Palavras-chave: prótese dentária; perda de dente; envelhecimento; fatores de risco.

INTRODUCTION

The aging process is a global phenomenon happening in developed and developing countries, including Brazil. This may influence the overall health of the elderly, which includes higher exposure to chronic oral diseases, such as dental caries and periodontal diseases[1,2]. Due to those conditions, these individuals may present more tooth loss and other related problems, such as severe periodontitis[3,4].

The higher severity of tooth loss is considered the most important oral health problem among the elderly, which lead to impairments in many aspects of their lives[5]. In fact, studies have demonstrated that the elderly present an elevated mean of tooth loss[6-8], including a high percentage of edentulism[5]. In Brazil, although the rate of tooth loss has decreased among adolescents and adults, the same did not happen among the elderly[5]. Moreover, the main consequence of this problem is the need for oral rehabilitation.

Oral rehabilitation consists of the use of complete dentures, removable or fixed partial prosthesis, aiming to reestablish function, esthetics, and phonetics due to lost teeth. Data from the last national survey demonstrated that the need for oral rehabilitation in the elderly was 68.7%[9]. The high prevalence of need for dental prostheses has also been shown in other cross-sectional studies conducted in various parts of Brazil[10,11].

It is also known that the aging process increases the demand for health services and social security[12]. It must be highlighted that this may include the oral health of the elderly. In fact, the lack of access of dental services and the dental care practices based only on tooth extractions performed for many years[13] might explain the poor oral health conditions and the significant need for oral rehabilitation detected in this population.

The aim of the present study was to evaluate the use of and need for dental prostheses and associated factors in home-dwelling elderly, aged 65 to 74 years old, in a southern city of Brazil. The null hypothesis was that there is no statistically significant difference in the use and need of dental prosthesis in relation to demographic, socioeconomic, behavioral, and dental variables of these individuals.

METHOD

Study design and location

This is a cross-sectional study that involved home-dwelling elderly, aged 65 to 74 years old, of the urban area of Cruz Alta, a city located in the State of Rio Grande do Sul, Brazil. The city has 62,821 inhabitants and more than 95% of them live in the urban area[14]. Among these, 3,730 are aged 65 to 74 years old, and 58% are female. In 2010, the Gini Index was 0.5419[15]. The present study was revised and approved by the Ethical Committee of the Passo Fundo under protocol 1.531.862. All elderly read and signed the informed consent prior to their inclusion in the study.

Sample size calculation and sampling strategy

The sample size calculation was based on the prevalence of dental prosthesis need of 45.7% in the elderly, as previously demonstrated in the literature[16]. When we assumed that

the target population was 3,730, a level of significance of 95%, power of 90%, and an attrition rate of 10%, a total of 276 individuals was necessary. Regarding the use of dental prosthesis, the power of the present study was calculated *a posteriori*. It was used the prevalence of 83.6% and a confidence interval (CI) of 95%, leading a power of 100%.

Details of the sampling strategy may be found elsewhere[17]. Shortly, 17 (25% of the total number) neighborhoods or districts were randomly selected, respecting the proportionally of the elderly in these areas. The corners and the start residence were also randomly chosen. To each corner, the visits followed the clockwise manner. If necessary, other corners were selected until the approximate number of residences were visited. The researchers visited the selected households until they found sufficient number of individuals aged 65 to 74 years of age.

Inclusion and exclusion criteria

Only home-dwelling elderly, aged 65 to 74 years old, were included. The elderly had to present medical, physical, and mental conditions that allowed the collection of all data. In each residence, if more than one elderly fitted the eligibility criteria, all of them were invited to participate. In buildings, only one unit was included.

At least two visits were necessary before a residence was excluded. Moreover, we excluded individuals only visiting the residence, commercial buildings, home for the aged, and uninhabited households. Elderly that could not answer the applied questionnaire were excluded.

Clinical examination and interview

A structured questionnaire was applied, which included the following variables: sociodemographic data, oral hygiene and general health habits, and health history. Questions from the PCATool-SB Brazil validated for adults were used[18]. Clinical oral examination consisted of the assessment of use of and need for dental prosthesis. It was performed with wooden spatulas, without the use of artificial illumination or odontoscope.

The individuals were examined and interviewed between July and August 2016 by two teams. Each team was composed of an interviewer and an oral health examiner. In order to assume reproducibility, they were trained and calibrated by the study coordinator. The training consisted of theoretical lectures about the theme, discussion of all the question in the questionnaire, and explanation about how to perform the oral health examination. Prior to its application, the questionnaire was evaluated with elder patients the sought for treatment in the clinics of the University of Passo Fundo. The inter-examiner and intra-examiner reproducibility for the dental examination was verified in approximately 5% of randomly chosen individuals. The examinations were performed twice with two days of interval. Regarding the intra-examiner reproducibility, kappa coefficients of 1.00, 1.00 and 0.85 were achieved for use of dental prosthesis, need for dental prosthesis and teeth counting, respectively. Additionally, the inter-examiner reproducibility showed a minimum kappa coefficient of 0.70 for all the previously reported variables.

Statistical analyses

The dependent variables of the present study were use of and need for dental prostheses. For data analysis, the use of and need for dental prostheses were categorized into yes or no. Users were those individuals that, during the oral examination, presented one of the following dental prostheses: fixed partial denture, removable partial denture and complete denture. Meanwhile, need of dental prosthesis was established for those with any tooth loss without oral rehabilitation. The quality of the oral rehabilitation was not assessed, and loss of third molars was not considered.

The independent variables were age, sex, skin color, level of education, marital status, retirement, health problems, use of medications, smoking exposure, access to the dentist in the last 12 months, and frequency of toothbrushing.

Based on the median age, individuals were categorized into two groups, one with ≤69 years and another with >69 years of age. Skin color was dichotomized into white and non-white. The non-white group was composed with those that referred to be black, yellow, brown, or indigenous. The level of education was categorized into low, which included the illiterate elderly and those incomplete or complete elementary school; medium level, for those with incomplete or complete high school; and higher level, for the elderly with at least incomplete higher education.

Self-reported health problems were categorized into two groups: the elderly that referred to have at least one health problem and those without any health problem. Use of medication was also categorized into "yes" or "no": one with participants who reported the use of one or more medications, and another group that reported no use of medication, respectively. Toothbrush frequency was dichotomized into <2 times per day and ≥2 times per day.

All data analyses were conducted with SPSS software (SPPS, version 21.0, IBM Corp., Armonk, NY, USA). Associations between the dependent and independent variables were assessed by chi-square of Mann-Whitney tests. The level of significance was 5%. Use of and need for dental prosthesis were the main outcomes of the present study. Uni- and multivariate analyses were performed, using Poisson regression with robust variance. Moreover, subgroup analyses were performed to the use of dental prosthesis, considering those that use at least one fixed dental prosthesis and those that use at least one removable dental prosthesis (removable partial prosthesis and/or denture). To all models, independent variables were included in the multivariate model only if p-value was <0.20 in the univariate analysis with exception of the independent variable regarding access to a dentist which was maintained in the multivariate model regardless of its p-value. The maintenance of these variables was determined by the combination of a $P<0.05$ and analysis of effect modification. Multicollinearity analyses among the independent variables were also performed, and none was observed. The cutoff point for multicollinearity was determined as variance inflation factor <5 and tolerance >0.2.

RESULTS

Two-hundred and ninety-two households were visited, of which 260 and 287 households and elderly, respectively, were included in the present study. The response rate was 89.04%. In 32 households, the elderly refused to participate. Further details of the participants inclusion can be found elsewhere[17]. A mean (±standard deviation) age of the participants was 69.3±3.52, of which 102 (35.5%) were male and 185 (64.5%) were female. Regarding to skin color, 196 (68.3%) were white and 91 (31.7%) reported to be non-white. Low level of education was reported by 190 (62.6%) individuals and, from these, 17 (5.9%) were illiterate. Approximately 60% and 76.3% of the elderly were married and retired, respectively. Any type of health problem was observed in 86.4%. Moreover, approximately 42% reported history of smoking exposure (Table 1).

The prevalence of use of dental prosthesis was 83.6%. Conversely, the prevalence of need for dental prostheses was 42.5%. The use of at least one fixed or removable dental prosthesis were observed, respectively, in 6.3% (n=18) and 80.8% (n=232). Among the elderly that did not use dental prosthesis, 87.2% (n=41) needed some type of oral rehabilitation. Among the users of prosthesis, 66.3% (n=159) did not need additional oral rehabilitation.

A statistically significant association between use of dental prosthesis and level of education (p<0.001) was observed. Sex was significantly associated with need for dental prostheses (p=0.016). No other variables were significantly associated with use of or need for dental prostheses, such as age, skin color, smoking exposure, access to the dentist in the last 12 months (Table 1).

An evaluation of the data in Table 2 shows that individuals with higher level of education presented significantly lower use of dental prosthesis when compared to those with low level (p=0.011). Regarding the need for dental prostheses, female elderly presented 28.2% lower prevalence ratio (PR) in comparison to males (p=0.014). Elderly with medium level of

Table 1. Sociodemographic data, oral hygiene and general health habits, and health history of the included sample in relation to use and need of dental prosthesis among the elderly, Cruz Alta, Brazil, 2016

Variables		Use of dental prosthesis		p-value	Need for dental prosthesis		p-value
		No	Yes		No	Yes	
		(n=47; 16.4%)	(n=240; 83.6%)		(n=165; 57.5%)	(n=122; 42.5%)	
Age	≤69 – n (%)	28 (59.6)	125 (52.1)	0.347*	83 (50.3)	70 (57.4)	0.235*
	>69 – n (%)	19 (40.4)	115 (47.9)		82 (49.7)	52 (42.6)	
Sex	Male – n (%)	22 (46.8)	80 (33.3)	0.078*	49 (29.7)	53 (43.4)	0.016*
	Female – n (%)	25 (53.2)	160 (66.7)		116 (70.3)	69 (56.6)	
Skin color	White – n (%)	30 (63.8)	166 (69.2)	0.472*	119 (72.1)	77 (63.1)	0.105*
	Non-white – n (%)	17 (36.2)	74 (30.8)		46 (27.9)	45 (36.9)	
Level of education	Low – n (%)	26 (55.3)	164 (68.3)	0.001*	103 (62.4)	87 (71.3)	0.087*
	Medium – n (%)	5 (10.6)	47 (19.6)		37 (22.4)	15 (12.3)	
	High – n (%)	16 (34.0)	29 (12.1)		25 (15.2)	20 (16.4)	
Marital status	Married – n (%)	24 (51.1)	141 (58.8)	0.091*	91 (55.2)	74 (60.7)	0.219*
	Single – n (%)	10 (21.3)	21 (8.8)		15 (9.1)	16 (13.1)	
	Divorced – n (%)	5 (10.6)	27 (11.3)		23 (13.9)	9 (7.4)	
	Widow – n (%)	8 (17.0)	51 (21.3)		36 (21.8)	23 (18.9)	
Retirement	Yes – n (%)	38 (80.9)	181 (75.4)	0.423*	125 (75.8)	94 (77.0)	0.799*
	No – n (%)	9 (19.1)	59 (24.6)		40 (24.2)	28 (23.0)	
Health problems	Yes – n (%)	41 (87.2)	207 (86.3)	0.857*	141 (85.5)	107 (87.7)	0.582*
	No – n (%)	6 (12.8)	33 (13.8)		24 (14.5)	15 (12.3)	
Use of medication	Yes – n (%)	35 (74.5)	202 (84.2)	0.109*	135 (81.9)	102 (83.6)	0.693*
	No – n (%)	12 (25.5)	38 (15.8)		30 (18.2)	20 (16.4)	
Smoking exposure	Smokers – n (%)	6 (12.8)	29 (12.1)	0.929*	22 (13.3)	13 (10.7)	0.596*
	Former smokers – n (%)	15 (31.9)	71 (29.6)		46 (27.9)	40 (32.8)	
	Nonsmokers – n (%)	26 (55.3)	140 (58.3)		97 (58.8)	69 (56.6)	
Alcohol exposure	Yes – n (%)	14 (29.8)	96 (40.0)	0.188*	58 (35.2)	52 (42.6)	0.198*
	No – n (%)	33 (70.2)	144 (60.0)		107 (64.8)	70 (57.4)	
Access to the dentist	Yes – n (%)	26 (55.3)	109 (45.4)	0.214*	76 (46.1)	59 (48.4)	0.700*
	No – n (%)	21 (44.7)	131 (54.6)		89 (53.9)	63 (51.6)	
Toothbrush frequency	<2 times/day – n (%)	14 (29.8)	47 (19.6)	0.118*	34 (20.6)	27 (22.1)	0.755*
	≥2 times/day – n (%)	33 (70.2)	193 (80.4)		131 (79.4)	95 (77.9)	

Legend: *Chi-square

Table 2. Univariate analysis of the association between use and need of dental prosthesis and the independent variables in the elderly, Cruz Alta, Brazil, 2016

Variables		Use of dental prosthesis	p-value	Need for dental prosthesis	p-value
		Prevalence ratio (95%CI)		Prevalence ratio (95%CI)	
Age	**≤69**	Ref.		Ref.	
	≥70	1.050 (0.949 – 1.163)	0.343	0.848 (0.645 – 1.115)	0.239
Sex	**Male**	Ref.		Ref.	
	Female	1.103 (0.981 – 1.239)	0.100	0.718 (0.551 – 0.935)	0.014
Skin color	**White**	Ref.		Ref.	
	Non-white	0.960 (0.856 – 1.077)	0.488	1.259 (0.960 – 1.651)	0.096
Level of education	**Low**	Ref.		Ref.	
	Medium	1.047 (0.943 – 1.163)	0.391	0.630 (0.400 – 0.992)	0.046
	High	0.747 (0.597 – 0.934)	0.011	0.971 (0.676 – 1.393)	0.872
Marial status	**Married**	Ref.		Ref.	
	Single	0.793 (0.617 – 1.019)	0.070	1.151 (0.787 – 1.684)	0.469
	Divorced	0.987 (0.840 – 1.161)	0.878	0.627 (0.351 – 1.119)	0.114
	Widow	1.012 (0.898 – 1.139)	0.850	0.869 (0.606 – 1.247)	0.447
Retirement	**Yes**	Ref.		Ref.	
	No	1.050 (0.940 – 1.173)	0.390	0.959 (0.695 – 1324)	0.801
Health problems	**Yes**	Ref.		Ref.	
	No	1.014 (0.877 – 1.172)	0.853	0.891 (0.585 – 1.359)	0.593
Use of medication	**Yes**	Ref.		Ref.	
	No	0.892 (0.756 – 1.051)	0.172	0.929 (0.642 – 1.345)	0.698
Smoking exposure	**Smokers**	Ref.		Ref.	
	Former smokers	0.996 (0.833 – 1.192)	0.968	1.252 (0.770 – 2.038)	0.365
	Nonsmokers	1.018 (0.864 – 1.200)	0.833	1.119 (0.701 – 1.786)	0.637
Alcohol exposure	**Yes**	Ref.		Ref.	
	No	0.932 (0.843 – 1.031)	0.170	0.837 (0.640 – 1.094)	0.193
Access to the dentist	**Yes**	Ref.		Ref.	
	No	1.067 (0.962 – 1.185)	0.219	0.948 (0.725 – 1.241)	0.699
Toothbrush frequency	**<2 times/ day**	Ref.		Ref.	
	≥2 times/ day	0.991 (0.886 – 1.109)	0.879	0.851 (0.642 – 1.128)	0.262

education showed 37% lower PR of dental prosthesis need in comparison to those with lower level (p=0.046).

In addition to those variables, we included sex, marital status, level of education and exposure to alcohol in the multivariate model of use of dental prosthesis. Moreover, the multivariate model for need for dental prostheses was composed by sex, skin color, marital status, level of education, and exposure to alcohol.

Sex, level of education and alcohol exposure were significantly associated with use of dental prosthesis (Table 3). Female elderly presented 14.6% higher PR of using dental prosthesis in comparison to males (p=0.021). Conversely, elderly with higher level of education presented a PR 26.3% lower of using dental prosthesis when compared to those elderly with lower education (p=0.008). Additionally, elderly that reported no exposure to alcohol presented 10.7% less PR of using dental prosthesis in comparison to those with history of alcohol exposure (p=0.024).

Sex and level of education were also significantly associated with need for dental prostheses (Table 3). Female elderly presented 30.3% lower PR of need for dental prostheses in comparison to males (p=0.007). Those with medium level of education also presented a lower PR of need for dental prostheses when compared to the lower level of education (PR= 0.596 95%CI: 0.385 – 0.921). However, the higher level of education, when compared to the lower level, was not significantly associated with need for dental prostheses (p=0.813). The access to the dentist presented no statistically significant association with use and need of dental prostheses.

The adjusted prevalence ratios for the association between type of dental prosthesis used and the independent variables are presented in Table 4. In this subgroup analysis, the use of at least one fixed prosthesis was not significantly associated with sex, level of education and access to the dentist. Conversely, those that did not consume alcohol presented 54.1% lower PR of using a fixed dental prosthesis. Similarly, the absence of alcohol use of significantly associated with lower use of removable dental prosthesis (PR: 0.900; 95%CI: 0.814 – 0.994).

Table 3. Multivariate analysis of the association between use and need of dental prosthesis and the independent variables among the elderly, Cruz Alta, Brazil, 2016

Variables		Use of dental prosthesis	p-value	Need for dental prosthesis	p-value
		Prevalence ratio (95%CI)		Prevalence ratio (95%CI)	
Sex	**Male**	Ref.		Ref.	
	Female	1.146 (1.021 – 1.285)	0.021	0.697 (0.536 – 0.905)	0.007
Level of education	**Low**	Ref.		Ref.	
	Medium	1.052 (0.948 – 1.168)	0.339	0.596 (0.385 – 0.921)	0.020
	High	0.737 (0.588 – 0.923)	0.008	0.955 (0.650 – 1.402)	0.813
Alcohol exposure	**Yes**	Ref.		-	-
	No	0.893 (0.810 – 0.985)	0.023		
Access to the dentist	**Yes**	Ref.		Ref.	
	No	1.031 (0.933 – 1.138)	0.552	0.903 (0.687 – 1.187)	0.464

Table 4. Adjusted prevalence ratio for the association between type of dental prosthesis used and independent variables among the elderly, Cruz Alta, 2016.

Variables		Use of fixed dental prosthesis	p-value	Use of removable dental prosthesis	p-value
		Prevalence ratio (95%CI)		Prevalence ratio (95%CI)	
Sex	**Female**	1.305 (0.618 – 2.757)	0.485	1.155 (1.026 – 1.300)	0.017
Level of education	**Medium**	1.635 (0.734 – 3.645)	0.229	1.058 (0.951 – 1.177)	0.302
	High	0.691 (0.276 – 1.732)	0.431	0.704 (0.547 – 0.906)	0.006
Alcohol exposure	**No**	0.459 (0.227 – 0.927)	0.030	0.900 (0.814 – 0.994)	0.038
Access to the dentist	**No**	0.248 (0.061 – 1.009)	0.051	1.043 (0.941 – 1.155)	0.424

Legend: reference categories were male (for sex), low (for level of education), and yes (for both alcohol exposure and access to the dentist)

Additionally, higher level of education was associated with lower use of removable dental prosthesis. A significant higher use of removable dental prosthesis was observed among the female elderly (PR: 1.155; 95%CI: 1.026 – 1.300).

DISCUSSION

The present study aimed to evaluate the prevalence of use of and need for dental prostheses among the elderly of a southern Brazilian city. Epidemiologic studies about oral rehabilitation are important, especially when precarious oral health in the elderly is observed. Sex and level of education were associated with both use of and need for dental prostheses. More specifically, the use of removable dental prosthesis. Meanwhile, exposure to alcohol was significantly associated with use of all types of dental prosthesis.

In Brazil, high extension and severity of tooth loss are observed, demanding higher prevalence of oral rehabilitation[9]. These conditions are of major importance, as they are related to the masticatory function and the nutritional status of the elderly[17]. Moreover, studies that assess the prevalence of oral rehabilitation in the elderly are needed, as the literature shows that individuals that need oral rehabilitation tend to present worse self-perception of their oral appearance[19]. It is noteworthy that appearance is part of self-esteem, which is of significant importance in all life cycles, including the elderly.

In the present study, approximately, 83% of the elderly use dental prosthesis, meanwhile 42% of them are in need of some type of oral rehabilitation. Most dental prosthesis used were removable (partial and/or denture). These results may be in contrast with other studies also conducted in Brazil[9,20,21]. The last national oral health survey showed that only 54% of the elderly used dental prosthesis[22]. Moreover, other studies, conducted in different regions of Brazil, showed a higher need for dental prostheses, ranging from 63.3% to 73% in the superior arch and 82.1% to 91% in the inferior arch[20,21]. Regarding the last national oral health survey, the need for dental prostheses was 68.7%[9]. In this sense, regarding oral health, the results of the present study confirm the large disparity among regions of Brazil. Also, timespan may account for the observed differences. In addition, the national survey is representative of the country

and the present study is representative of elders living in an urban area, excluding those that are institutionalized.

Female elderly presented 30.3% lower PR of need dental prosthesis as compared to males. In fact, other studies conducted in Brazil have demonstrated similar results[9,16,23]. Although elderly women present higher mean tooth loss when compared to men[7], the literature also reports that they demonstrate higher health self-care and access to the dentist and, consequently, higher use of dental prosthesis[24].

Several sociodemographic factors may be associated with poor oral health, and the level of education may be one of the most important. It is known that the higher level of education is associated with better health conditions and higher life expectancy[25]. In this context, in the present study, level of education was associated with both use of and need for dental prostheses. It has been reported that the elderly with low level of education have lower access to the dentist, which may lead to high need for dental prostheses[26], which may partially explain why individuals with higher level of education presented a lower use of removable dental prosthesis. Additionally, it may be hypothesized that the lack of comprehension about the importance of oral rehabilitation may influence in these results. Moreover, individuals with higher level of education may perceive the importance of good oral hygiene practices[24].

Although several studies reported that smokers present worst oral health conditions[27,28] in the present study, only exposure to alcohol was associated with all types of dental prosthesis use. It must be highlighted that, similarly to smoking, the consumption of alcohol may represent negligence of habits of oral health, worst eating habits, and nutrition deficits[29]. In consequence of these behavioral aspects, this elderly may less frequently seek dental care, therefore, presenting lower rates of oral rehabilitation.

Concern with appearance and the stigma of losing teeth as inevitable are part of the elderly life[30]. The use of and need for dental prosthesis may be included in these processes. We should emphasize that these questions may not be extrapolated to all countries, as different culture issues may exist, especially in developed countries where higher rates of oral rehabilitation are detected[31]. It may be hypothesized that, as life expectance increases over the years, these disparities may decrease. However, the analytical part of the present study, i.e., the associated factors are similar worldwide.

One of the main advantages of the present study is its representability of the sample of the elderly of Cruz Alta, Brazil. In this sense, the proportion of men and women involved in the present study were remarkably similar to the one found in the last census of the city[14]. Additionally, the examiners were trained and calibrated in order to assure data reproducibility. In contrast, limitations must be pointed out: the cross-sectional design, which does not allow temporality, and lack of assessment of the quality of oral rehabilitation and masticatory ability. Further studies should assess the impact of the quality of oral rehabilitation in the masticatory ability among the elderly. Despite of that, the present study may present high external validity to other populations with similar sociodemographic characteristics.

The results found in this study may be considered in public health planning, especially when trying to decrease the rates of tooth loss among the elderly and pursuing monetary resources to provide oral health rehabilitation. It was also detected that the elderly of Cruz Alta presented a slightly better oral health when compared to the national regarding the outcomes assessed. Despite of that, it is still notorious the high demand of oral rehabilitation.

CONCLUSION

It was concluded the sex and level of education are associated with both use of and need for dental prostheses, and that exposure to alcohol is associated only with use of dental prosthesis. Regardless to the type of dental prosthesis, the absence of alcohol exposure was associated with lower use of dental prosthesis. The access to the dentist in the last 12 months may not influence both use of and need for dental prostheses.

cadernos
**Saúde
Coletiva**

REFERENCES

1. Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJ, Marcenes W. Global burden of severe periodontitis in 1990-2010: a systematic review and meta-regression. J Dent Res. 2014;93(11):1045-53. http://dx.doi.org/10.1177/0022034514552491. PMid:25261053.

2. Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJ, Marcenes W. Global burden of untreated caries: a systematic review and metaregression. J Dent Res. 2015;94(5):650-8. http://dx.doi.org/10.1177/0022034515573272. PMid:25740856.

3. Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJ, Marcenes W. Global burden of severe tooth loss: a systematic review and meta-analysis. J Dent Res. 2014;93(7 Suppl):20S-8S. http://dx.doi.org/10.1177/0022034514537828. PMid:24947899.

4. Echeverria MS, Wünsch IS, Langlois CO, Cascaes AM, Ribeiro Silva AE. Oral health-related quality of life in older adults-Longitudinal study. Gerodontology. 2019;36(2):118-24. http://dx.doi.org/10.1111/ger.12387. PMid:30565315.

5. Peres MA, Barbato PR, Reis SC, Freitas CH, Antunes JL. Tooth loss in Brazil: analysis of the 2010 Brazilian Oral Health Survey. Rev Saude Publica. 2013;47(Suppl 3):78-89. http://dx.doi.org/10.1590/S0034-8910.2013047004226. PMid:24626584.

6. Bortoluzzi MC, Traebert J, Lasta R, Da Rosa TN, Capella DL, Presta AA. Tooth loss, chewing ability and quality of life. Contemp Clin Dent. 2012;3(4):393-7. http://dx.doi.org/10.4103/0976-237X.107424. PMid:23633796.

7. Susin C, Oppermann RV, Haugejorden O, Albandar JM. Tooth loss and associated risk indicators in an adult urban population from south Brazil. Acta Odontol Scand. 2005;63(2):85-93. http://dx.doi.org/10.1080/00016350510019694. PMid:16134547.

8. Ribeiro CG, Cascaes AM, Silva AE, Seerig LM, Nascimento GG, Demarco FF. Edentulism, severe tooth loss and lack of functional dentition in elders: a study in southern Brazil. Braz Dent J. 2016;27(3):345-52. http://dx.doi.org/10.1590/0103-6440201600670. PMid:27224572.

9. Azevedo JS, Azevedo MS, Oliveira LJC, Correa MB, Demarco FF. Needs for dental prostheses and their use in elderly Brazilians according to the National Oral Health Survey (SBBrazil 2010): prevalence rates and associated factors. Cad Saude Publica. 2017;33(8):e00054016. PMid:28832778.

10. Baumgarten A, Schimidt JG, Rech RS, Hilgert JB, Goulart BNG. Dental status, oral prosthesis and chewing ability in an adult and elderly population in southern Brazil. Clinics. 2017;72(11):681-5. http://dx.doi.org/10.6061/clinics/2017(11)06. PMid:29236914.

11. de Souza FN, de Siqueira Gomes C, Rodrigues AR, Tiossi R, de Gouvêa CV, de Almeida CC. Partially edentulous arches: a 5-year survey of patients treated at the Fluminense Federal University removable prosthodontics clinics in Brazil. J Prosthodont. 2015;24(6):447-51. http://dx.doi.org/10.1111/jopr.12225. PMid:25273591.

12. Miranda G, Mendes A, Silva A. Population aging in Brazil: current and future social challenges and consequences. Rev Bras Geriatr Gerontol. 2016;19(3):507-19. http://dx.doi.org/10.1590/1809-98232016019.150140.

13. Colussi C, Patel F. Uso e necessidade de prótese dentária no Brasil: avanços, perspectivas e desafios. Health Soc Change. 2016;7:41-8.

14. Instituto Brasileiro de Geografia e Estatística. Censo demográfico 2010: característica da população e domicílios: resultados gerais. Rio de Janeiro: IBGE; 2011.

15. Brasil. Ministério da Saúde. DATASUS: indice de gini da renda domiciliar per capita – Rio Grande do Sul. 2010 [Internet]. 2010 [cited 2017 Nov 16]. Available from: https://datasus.saude.gov.br/informacoes-de-saude-tabnet/.

16. Mesas A, Andrade S, Cabrera M. Oral health status of community-dwelling elderly in Londrina, Paraná, Brazil. Rev Bras Epidemiol. 2006;9(1):471-80. http://dx.doi.org/10.1590/S1415-790X2006000400008.

17. Stoffel LM, Muniz FWMG, Colussi PRG, Rösing CK, Colussi EL. Nutritional assessment and associated factors in the elderly: a population-based cross-sectional study. Nutrition. 2018;55-56:104-10. http://dx.doi.org/10.1016/j.nut.2018.03.053. PMid:29980089.

18. Brasil. Ministério da Saúde. Manual do Instrumento de Avaliação da Atenção Primária à Saúde: PCATool-Brasil [Internet]. 2010 [cited 2016 May 4]. Available from: https://bvsms.saude.gov.br/bvs/publicacoes/manual_avaliacao_pcatool_brasil.pdf.

19. Vilela EA, Martins AM, Barreto SM, Vargas AM, Ferreira RC. Association between self-rated oral appearance and the need for dental prostheses among elderly Brazilians. Braz Oral Res. 2013;27(3):203-10. http://dx.doi.org/10.1590/S1806-83242013005000010. PMid:23657484.

20. Medeiros J, Rodrigues L, Azevedo A, Lima Neto E, Machado L, Valença A. Edentulismo, uso e necessidade de prótese e fatores associados em município do Nordeste brasileiro. Pesq BrasOdontoped Clin Integr. 2012;12(4):573-8. http://dx.doi.org/10.4034/PBOCI.2012.124.20.

21. Crispim A, Saupe R, Boing A. Perfil epidemiológico do uso e necessidade de prótese e de alterações de tecidos moles bucais em idosos de uma comunidade de Itajaí-SC. Arq Catarin Med. 2009;38(2):53-7.

22. Brasil. Ministério da Saúde. SB Brazil 2010: Brazilian Oral Health Survey: main results. Brasília, DF: Ministério da Saúde; 2012.

23. Mallmann F, Toassi R, Abegg C. Epidemiological profile of need and use of dental prosthesis by individuals aged 50-74 years, residents in three Health Districts of the Municipality of Porto Alegre, State of Rio Grande do Sul, Brazil, in 2008. Epidemiol Serv Saude. 2012;21:79-88. http://dx.doi.org/10.5123/S1679-49742012000100008.

24. Agostinho A, Campos M, Silveira J. Edentulismo, uso de prótese e autopercepção de saúde bucal entre idosos. Rev Odontol UNESP. 2015;44(2):74-9. http://dx.doi.org/10.1590/1807-2577.1072.

25. Baker DP, Leon J, Smith Greenaway EG, Collins J, Movit M. The education effect on population health: a reassessment. Popul Dev Rev. 2011;37(2):307-32. http://dx.doi.org/10.1111/j.1728-4457.2011.00412.x. PMid:21984851.

26. Martins AM, Barreto S, Pordeus I. Uso de serviços odontológicos entre idosos brasileiros. Rev Panam Salud Publica. 2007;22(5):308-16. http://dx.doi.org/10.1590/S1020-49892007001000003. PMid:18198039.

27. Lorenzo SM, Alvarez R, Andrade E, Piccardo V, Francia A, Massa F, et al. Periodontal conditions and associated factors among adults and the elderly: findings from the first National Oral Health Survey in Uruguay. Cad Saude Publica. 2015;31(11):2425-36. http://dx.doi.org/10.1590/0102-311X00012115. PMid:26840821.

28. Dietrich T, Walter C, Oluwagbemigun K, Bergmann M, Pischon T, Pischon N, et al. Smoking, smoking cessation, and risk of tooth loss: The EPIC-potsdam study. J Dent Res. 2015;94(10):1369-75. http://dx.doi.org/10.1177/0022034515598961. PMid:26243734.

29. Khairnar M, Wadgave U, Khairnar S. Effect of alcoholism on oral health: a review. J Alcohol Drug Depend. 2017;5(03):1000266. http://dx.doi.org/10.4172/2329-6488.1000266.

30. Graham R, Mihaylov S, Jepson N, Allen PF, Bond S. Determining "need" for a Removable Partial Denture: a qualitative study of factors that influence dentist provision and patient use. Br Dent J. 2006;200(3):155-8, discussion 147. http://dx.doi.org/10.1038/sj.bdj.4813193. PMid:16474363.

31. Matsuyama Y, Aida J, Takeuchi K, Tsakos G, Watt RG, Kondo K, et al. Inequalities of dental prosthesis use under universal healthcare insurance. Community Dent Oral Epidemiol. 2014;42(2):122-8. http://dx.doi.org/10.1111/cdoe.12074. PMid:24102497.