

Association between depressive symptoms and dental care-seeking behavior among elderly Brazilian people

Associação entre sintomas depressivos e comportamento de procura de cuidados odontológico entre idosos brasileiros

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Resumo

Introdução: Os sintomas depressivos são altamente prevalentes na população idosa (10%). Estes sintomas aparecem frequentemente quando há uma perda de qualidade de vida associada à exclusão social e ao aparecimento de doenças graves. Sentimentos de tristeza, desânimo, desânimo e decepção, e eventos, tais como a perda de amigos próximos e familiares podem também estar relacionados a estes sintomas. As consequências de sintomas depressivos incluem os resultados negativos de saúde oral, tais como uma diminuição na frequência de escovação, maior prevalência de cárie e maior probabilidade do aparecimento de periodontite. **Objetivo:** Este estudo teve como objetivo avaliar a associação entre a presença de sintomas depressivos e comportamento saúde bucal orientada para o problema, bem como a ausência de comportamento de procura de cuidados de saúde. Foram avaliados 872 idosos vivendo em dois distritos de saúde em Porto Alegre. **Material e método:** Eles forneceram informações sobre variáveis socioeconômicas em uma entrevista, e responderam à Escala de Depressão Geriátrica-15 e a um questionário avaliando o comportamento de procura de cuidados dentários. Além disso, foi realizado um exame oral. Quando analisados por meio de regressão de Poisson com variância robusta, as variáveis sexo masculino, menor escolaridade, menor renda, número de dentes reduzidos, presença de restos de raiz e presença de sintomas depressivos foram encontrados para ser associados de forma independente com o resultado. **Resultado:** Houve uma diferença significativa em relação ao comportamento de procura de cuidados dentários em relação aos idosos com sintomas depressivos e aqueles em baixo nível socioeconômico com estatuto oral deficiente. **Conclusão:** Concluiu-se que esses fatores precisam ser levados em consideração ao avaliar o comportamento de procura de cuidados dentários.

Descritores: Atendimento odontológico; epidemiologia; idoso; depressão.

Abstract

Background: Depressive symptoms are highly prevalent among the elderly population (10%). These symptoms frequently appear when there is a loss of quality of life associated with social exclusion and the appearance of severe diseases. Feelings of sadness, discouragement, despondency and deception, and events such as the loss of close friends and family can also be related to these symptoms. The consequences of depressive symptoms include negative oral health outcomes, such as a decrease in the frequency of toothbrushing, greater prevalence of caries and higher probability of the appearance of periodontitis. **Aim:** This study aimed to evaluate the association between the presence of depressive symptoms and problem-oriented oral healthcare behavior, as well as the absence of healthcare-seeking behavior. **Material and method:** 872 elderly people living in two health districts in Porto Alegre were evaluated. They provided information on socioeconomic variables at an interview, and responded to the Geriatric Depression Scale-15 and to a questionnaire assessing dental care-seeking behavior. In addition, an oral examination was performed. When analyzed using Poisson regression with robust variance, the variables of male sex, less schooling, lower income, reduced number of teeth, presence of root remnants and presence of depressive symptoms were found to be independently associated with the outcome. **Result:** There was a significant difference regarding dental care-seeking behavior in relation to elderly people presenting depressive symptoms and those in low socioeconomic strata having poor oral status. **Conclusion:** It was concluded that these factors need to be taken into consideration when evaluating dental care-seeking behavior.

Descriptors: Dental care; epidemiology; elderly; depression.

INTRODUCTION

The phenomenon of an aging population is of global proportions¹ and studies have indicated that the decrease in fertility rates followed by an increase of longevity, is the cause of the age structure transition². In Brazil, this phenomenon is taking place at an accelerated pace, in comparison with what has been seen in European countries, as evidenced by the rapid growth of the Brazilian elderly population³.

With the increased aging of the world population, there have also been changes in disease patterns. Brazil, following the world trend, has gone through a process of epidemiological transition, resulting in a significant increase in the prevalence of non-communicable chronic diseases⁴. According to Mendes⁵, an epidemiological transition involves the alteration of a country's morbidity-mortality profile and it includes a triple disease burden: (i) a not completed agenda of infections, malnutrition and reproductive health disorders; (ii) the challenge of chronic diseases and their risk factors; and, (iii) morbidity and mortality related to external causes.

There is a high prevalence of illnesses among the elderly. The four most prevalent, called the geriatric giants by the WHO⁶, are: memory loss, urinary incontinence, depression and falls/immobility. Moreover, hypertension and diabetes are the two main chronic diseases responsible for a high proportion of other diseases and deficiencies.

The causes of depression among the elderly lie within a broad context, in which genetic factors, life events and disabling diseases, among others, all play a role. Depressive disorders frequently appear when there is a loss of quality of life associated with social exclusion and the appearance of severe diseases⁷.

Depressive symptoms are highly prevalent among the elderly population. Some studies on prevalence have indicated that more than 10% of the elderly present some form of depressive state. This number increases to 30% when institutionalized elderly individuals are evaluated⁸. Snowdon⁹ observed a high prevalence of depression among elderly individuals around the world, including Brazil.

The consequences of depressive symptoms include negative oral health outcomes, such as a decrease in the frequency of toothbrushing, greater prevalence of caries and higher probability of the appearance of periodontitis¹⁰. The hypothesis of the present study was that depressive symptoms might be related to the outcome measured, with regard to absence of seeking dental care or guided searching for problems relating to the mouth, teeth or dental prosthetics.

MATERIAL AND METHOD

Design: Cross-sectional study

Sampling procedure

Individuals aged 60 years or more, who were living in areas within the administrative districts of Lomba do Pinheiro and Partenon in Porto Alegre, RS, were invited to participate in the study. Only individuals who did not present cognitive deficits, assessed using

the Mini-Mental State Examination (MMSE) screening test, were included in the study^{11,12}.

Cluster sampling

Following the methodology proposed by Barros, Victora¹³, proportional cluster sampling was carried out. This was based on randomly drawing 61 census tracts from among the 240 tracts (geographical subdivisions of the municipality, defined by the IBGE) within the administrative districts of Lomba do Pinheiro and Partenon.

1st stage – Census tract

After a list of all census tracts composing the district had been obtained, tracts were randomly drawn using simple random sampling. This drawing maintained proportionality in relation to the size of the coverage area of each healthcare unit, since traditional primary health care units usually cover larger territories and, consequently, include larger numbers of people than the units operated in accordance with the Family Health Strategy.

2nd stage – Block

The street blocks defined as the starting points for the examinations in each tract were selected based on a flowchart compiled from maps of the tracts. The blocks were numbered and the sequence of blocks to be covered was defined. In each block, one corner was randomly chosen to represent the initial point.

3rd stage – Homes

From the initial street corner, the visits started with the first house and proceeded to the left as viewed when facing the initial corner. After the first house, one house was skipped and the next was included, until thirty interviews relating to that census tract had been obtained.

Calculation of the sample size

To calculate the sample size, a pilot study was carried out with 50 elderly individuals who lived in the same administrative district. The sample calculation was performed based on the main study, taking into consideration the prevalence of self-perception of good, very good or excellent oral health, which presented a total of 59%. The ratio of the prevalence of elderly individuals who had adequate primary care was estimated to be 1.32. Thus, with the bi-directional alpha defined as 0.05 and the beta as 0.20, the total sample was calculated to be 454 elderly people. Another 10% was added to account for possible losses or refusals and 15% to control for confounding factors. Lacking a precise estimate to minimize the design effect that occurs in cluster sampling, the sample was broadened 1.5-fold to make the adjusted analyses. Thus, the sample size of 883 individuals was reached.

Logistics

The present study was approved by the Research Ethics Committees of the Dentistry School of UFRGS on June 18, 2009, in record No. 05/09, with the procedural number 15297.

After the team of interviewers had been trained, data were gathered in the subjects' homes. First, potential participants were invited to participate and the objectives of the study were explained. Those who agreed to participate in the study and signed the free and informed consent statement answered an identification questionnaire and took the MMSE. The participants who met the

inclusion criteria also answered a standardized questionnaire that had been drawn up for the present study.

Out of the total of 994 elderly individuals who were invited to participate in the study, 83 were not found at home on the day of the examination and it was impossible to schedule an examination, even after three attempts; 26 refused to participate; 23 did not reach the cutoff point of the MMSE. The sample for this study was therefore composed of 862 elderly people who signed the free and informed consent statement, agreed to participate in the study and were suitable to form part of this sample. Fifty-three elderly individuals answered the questionnaires but did not agree to undergo dental examinations.

Measurements

- Sociodemographic questionnaire: The information sought included age, sex, conjugal situation, educational level in years, and monthly family income. The variables were categorized for the purposes of statistical analyses. Age was categorized as: up to 70 years or 70 years or more; the conjugal situation was either married or unmarried, which included single, divorced and widowed; educational level was considered as: up to 6 years or 6 years or more; family income was categorized as > R\$ 1,090.00 (two minimum wages) or ≤ R\$ 1,090.00.
- Mini-Mental State Examination: This instrument gives information on different cognitive parameters. The cutoff points, suggested in the literature (16) and adopted as inclusion criteria here, were at least 13 points for illiterate individuals, 18 for individuals with a medium educational level (1 to 8 years of study) and 26 for individuals with a high educational level (9 years or more of study).
- Geriatric Depression Scale (GDS-15): The original GDS, containing 30 questions, was developed by Yesavage et al.¹⁴. The version used in the present study contained 15 questions. At the end, the score was summed and the cutoff point used in this version was 5/6 for the determination of *is not a case/is a case*.
- Objective question about seeking dental care: The outcome variable was evaluated through the following question: "When do you seek oral healthcare?" The responses included the following options: "I never do", "when I have some problem", "occasionally, with or without problems" and "regularly". For analysis purposes, the responses were dichotomized into "never/guided by problems" and "occasionally/regularly".
- Dental examination: The examination was carried out using wooden toothpicks and a flashlight. The number of teeth, number of root fragments, use of dental prosthetics and any alteration of the soft tissue were evaluated. The number of teeth was categorized taking into consideration a reduced dental arch formed by at least 20 teeth, which was characterized as acceptable from a functional point of view. The root fragments were categorized based on their distribution as "0" or "at least 1". The presence or absence of dental prosthetics was observed, and alteration of soft tissue was categorized as either "present" or "absent".

Statistical Analysis

The data were charted using the PASW software, version 18.0, and then statistical analyses were performed. The qualitative variables

were described in the form of absolute and relative frequencies. Differences between the explanatory variables and the outcomes were investigated using the chi-square test. Associations between depressive symptoms and absence of seeking dental care were estimated using the prevalence ratio (PR). Poisson regression models with robust adjustment of variance were developed for PR estimates adjusted for other predictor variables. Univariate analysis was carried on each independent variable for the outcome. The following variables were analyzed: sex, educational level, monthly family income, number of teeth, alteration of soft tissue and presence of root fragments, marital status in addition to the main variable of depressive symptoms. The statistically significant variables, defined as $p \leq 0.20$, in the univariate analysis were selected for the multivariate model. The variables that did not contribute to the model were excluded and a new model was calculated. The adjusted prevalence ratios (PR) are presented, as well as their 95% confidence intervals (95% CI).

RESULT

The frequencies of the variables analyzed are presented in Table 1. The majority of the sample was female (67.9%), unmarried (53.1%) and aged 70 years or more (58.2%). The mean age of the study participants was 69.94 years (± 7.43). Most participants presented an educational level of up to 6 years (62.2%) and a monthly family income of two minimum wages or more (64.3%). Regarding oral conditions, 53.4% of the sample presented a reduced arch (1-19 teeth) and 31.3% were edentulous; the majority did not present alterations in the soft tissue (90.2%), used at least some sort of dental prosthetic (83.1%) and did not present root fragments (86%). Regarding the main variable, most participants did not present depressive symptoms (71.5%). The predominance of these characteristics was independent of seeking dental care.

The main sociodemographic and oral health characteristics of the sample, and the main variable of depressive symptoms according to the dental care sought, are presented in Table 2. Out of the total of 862 elderly individuals in the study, 76.2% never sought a dentist or did so only when there were problems relating to their mouth, teeth or prosthetics. There was a statistically significant difference between age ($p = 0.001$), educational level ($p < 0.001$), family income ($p < 0.001$), number of teeth ($p < 0.001$), use of prosthetics ($p < 0.001$), presence of root fragments ($p = 0.016$), alteration of soft tissue ($p = 0.04$), depressive symptoms ($p < 0.001$) and the outcome studied. However, the variables of marital status and sex did not present any statistically significant difference with the outcome.

Table 3 presents the crude and adjusted prevalence ratios for absence of seeking dental care or seeking it guided by problems, according to sociodemographic, economic and oral health characteristics. The prevalence was greater among men (PR = 1.16; 1.07-1.25), people with a lower educational level (PR = 1.22; 1.11-1.33), individuals with monthly family income of up to two minimum wages (PR = 1.15; 1.07-1.23), edentulous individuals (PR = 1.69; 1.43-2.00) and individuals with one or more root fragments present (PR = 1.24; 1.12-1.36).

Table 3 also shows the positive association between depressive symptoms and the absence of seeking dental care, which was observed in the crude analysis (PR = 1.21; 95% CI: 1.13-1.30) and was maintained after the adjusted analysis (PR = 1.14; 95% CI: 1.06-1.22).

Table 1. Frequency of variables

		N (%)
Age (in years)	≥ 70	502 (58.2)
	< 70	360 (41.8)
Sex	Female	585 (67.9)
	Male	277 (32.1)
Marital Status	Married	403 (46.9)
	Unmarried	457 (53.1)
Educational Level (in years)	≤ 6	536 (62.2)
	> 7	326 (37.8)
Monthly Family Income (in reais)	Up to 1090	308 (35.7)
	1091 or more	554 (64.3)
Number of teeth	0	255 (31.3)
	1-19	435 (53.4)
	20 or more	124 (15.2)
Alteration of soft tissues	Absent	740 (91.2)
	Present	71 (8.8)
Use of prosthesis	Uses some sort of prosthesis	676 (83.1)
	No use	137 (16.9)
Presence of root fragments	None	701 (86.0)
	One or More	114 (14.0)
Depressive symptoms	With depressive symptoms	246 (28.5)
	Without depressive symptoms	616 (71.5)

Table 2. Frequency of the variables studied in relation to the demand for dental care

		Searching for Dental Care		P value
		Never/ Oriented by Problems N(%)	occasionally / Regularly N(%)	
Age (in years)	≥ 70	362 (55.2)	139 (67.8)	0.001
	< 70	294 (44.8)	66 (32.2)	
Sex	Female	437 (66.6)	148 (72.2)	0.135
	Male	219 (33.4)	57 (27.8)	
Marital Status	Married	301 (45.9)	102 (49.8)	0.341
	Unmarried	354 (54.0)	103 (50.2)	
Educational Level	Up to 6 years	456 (69.5)	79 (38.5)	<0.001
	7 years or more	200 (30.5)	126 (61.5)	
Monthly Family Income (in reais)	Up to 1090	271 (41.3)	36 (17.6)	<0.001
	1091 or more	385 (58.7)	169 (82.4)	
Number of teeth	0	242 (39.1)	13 (6.7)	<0.001
	1-19	312 (50.4)	123 (63.4)	
	20 or more	65 (10.5)	58 (29.9)	
Alteration of soft tissues	Absent	555 (90.1)	184 (94.8)	0.04
	Present	61 (9.9)	10 (5.2)	
Use of prosthesis	Uses some sort of prosthesis	519 (83.8)	157 (80.9)	<0.001
	No use	100 (16.2)	37 (19.1)	
Presence of root fragments	None	523 (84.4)	177 (91.2)	0.016
	One or More	97 (15.6)	17 (8.8)	
Depressive symptoms	With depressive symptoms	214 (32.6)	32 (15.6)	<0.001
	Without depressive symptoms	442 (67.4)	173 (84.4)	

Table 3. Prevalence Ratios (PR) crude and adjusted for lack of demand for dental care or oriented by problems

		Lack of Demand for Dental Care or Targeted by Issue			
		PR total (CI 95%)	p-Value	PR adjusted (CI 95%)	p-Value
Sex	Female	1		1	
	Male	1.06 (0.98-1.15)	0.122	1.16 (1.07-1.25)	<0.01
Educational Level	Until 6 years	1.39 (1.27-1.53)		1.22 (1.11-1.33)	
	7 years or more	1	<0.01	1	<0.01
Monthly Family Income (in reais)	Up to 1090	1.27 (1.19-1.36)		1.15 (1.07-1.23)	
	1091 or more	1		1	<0.01
Number of teeth	0	1.80 (1.52-2.13)	<0.01	1.69 (1.43-2.00)	<0.01
	1-19	1.36 (1.14-1.62)	<0.01	1.26 (1.06-1.49)	<0.01
	20 or more	1		1	
Alteration of soft tissues	Absent	1		1	
	Present	1.15 (1.04-1.27)	<0.01	1.06 (0.96-1.17)	0.36
Presence of root fragments	None	1		1	
	One or More	1.14 (1.04-1.24)	<0.04	1,24 (1.12-1.36)	<0.01
Depressive symptoms	With depressive symptoms	1.21 (1.13-1.30)	<0.01	1.14 (1.06-1.22)	<0.01
	Without depressive symptoms	1		1	

DISCUSSION

The results of this cross-sectional study confirm the hypothesis that elderly individuals who present depressive symptoms seek no dental care, or only seek care in the presence of oral problems. This association was positive, even after adjustment for other factors such as sociodemographic and oral health variables. This was also consistent with recent literature in which associations with the outcome were shown independently¹⁵. Depressive symptoms have a close relationship with other oral health outcomes, according to the literature¹⁰, but, to our knowledge, this is the first study of elderly individuals who seek dental care and is therefore of importance.

In the present study, men presented greater absence of seeking dental care than women. This can be explained by the fact that the cultural construction of masculinity involves a common idea that seeking healthcare services is a female trait, together with fear of discovering that something is not well, lack of healthcare units specifically for men, time limitations and embarrassment about being exposed¹⁶. It is possible that these explanations are also maintained for dental services. On the contrary, as shown in many other studies, women tend to seek healthcare services more often than men^{17,18}. This can be explained in terms of women's greater awareness of their health and potential risks thereto, such that they tend to seek services with greater regularity¹⁷.

Low educational and income levels also presented positive associations with the absence of seeking dental care. With regard to seeking general healthcare services, studies have demonstrated that the associated individual factors include female sex, advanced age, higher socioeconomic level and comorbidities^{17,18}. Considering that individuals with low income levels cannot afford private healthcare

services, the lack of availability or the irregularity of access to public dental services may possibly influence this outcome. However, where there is good access to public services, educational level is possibly more relevant¹⁹. The association with lower educational level can be explained by lower access to health information, such as information on prevention and maintenance, thus leading to absence of these important regular visits to a dentist and doing so only when there are problems such as toothache. These are the motives most often reported in the study by Rosendo, Freitas¹⁵.

Regarding oral conditions, edentulous elderly individuals or those who had one or more root fragments presented an association with the outcome. In the case of edentulous individuals compared with toothed individuals, several studies have indicated lower prevalence of the use of dental services¹⁹. The absence of seeking dental care is expected to be associated with a high rate of edentulism among those elderly who do not feel the need for dental treatment, as shown in the study by Rosendo, Freitas¹⁵. The presence of root fragments might have shown an association because it represented an unfavorable oral condition, and thus possibly demonstrated negligence towards oral health, which is related to the lack of seeking dental care.

In the present analysis, there was a statistically significant difference among elderly people with depressive symptoms and the seeking of oral healthcare. Unlike seeking general healthcare services, for which individuals with depressive symptoms tend to have greater use, the frequency of seeking dental services tends to decrease. This, together with the emergence of acquired unfavorable behaviors towards oral health such as decreased frequency of brushing, has been reported by Anttila et al.¹⁰. Considering that some emotional factors such as fear and anxiety lead to delay in

elderly individuals' seeking dental care¹⁵, it can be suggested that this also includes depressive symptoms because there is a great emotional involvement in these situations. A large proportion of the prevalence of chronic diseases among the elderly is represented by diseases within the field of mental health. The main problems are affective disorders, with emphasis on individuals with depressive symptoms²⁰.

Independent of depressive symptoms, being elderly leads to reduced seeking of dental consultations. This continues to decrease with increasing age, as presented in the study by Kiyak²⁰, such that a low rate of use of dental services is expected. Therefore, the presence of depressive symptoms would contribute to increasing the rate of absence of seeking oral healthcare.

It is important to remember that the results of this study are limited and that generalizations may be affected by design and sampling characteristics. The fact that this study was carried out exclusively in one territory may have generated an overly homogeneous sample. The two districts have peculiar characteristics, which may not be represented in data from the entire municipality of Porto Alegre. Moreover, the proportion of elderly women in the sample was higher than the proportion of all women in the municipality, which is a common limitation in other studies.

Cross-sectional evaluations are believed to be extremely valid for understanding how changes in the reality of primary health care and the Brazilian National Healthcare System (SUS) can influence individuals' perceptions. Moreover, since this was the first study with this focus, it is possible that studies on the relationship that exists between access to different types of services and other outcomes relating to oral health may aid in justifying policies and formulating actions within the scope of SUS.

This study shows that emotional, socioeconomic and clinical characteristics need to be taken into consideration in evaluations of seeking dental care. Concomitantly, investments in oral health are needed so as to ensure access and increase motivation to seek regular preventive dental care. This is especially relevant among the elderly, considering the high prevalence of depressive symptoms which would further decrease the search for care by this age group, as was observed in this study.

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REFERENCES

1. Veras R. Population aging today: demands, challenges and innovations. *Rev Saude Publica*. 2009 Jun;43(3):548-54. <http://dx.doi.org/10.1590/S0034-89102009000300020>. PMID:19377752.
2. Ramos LR, Veras RP, Kalache A. Populational aging: a Brazilian reality. *Rev Saude Publica*. 1987 Jun;21(3):211-24. PMID:3445103.
3. Carvalho JA, Rodríguez-Wong LL. A transição da estrutura etária da população brasileira na primeira metade do século XXI. *Cad Saude Publica*. 2008 Mar;24(3):597-605. <http://dx.doi.org/10.1590/S0102-311X2008000300013>. PMID:18327447.
4. Malta DC, Cezario AC, Moura L, Morais OL No, Silva JB Jr. A construção da vigilância e prevenção das doenças crônicas não transmissíveis no contexto do Sistema Único de Saúde. *Epidemiol Serv Saude*. 2006 Set;15(3):47-65. <http://dx.doi.org/10.5123/S1679-49742006000300006>.
5. Mendes EV. As redes de atenção à saúde. *Ciênc Saude Coletiva*. 2010 Ago;15(5):2297-305. <http://dx.doi.org/10.1590/S1413-81232010000500005>. PMID:20802863.
6. World Health Organization. Age-friendly primary health care centres toolkit. Geneva; 2008.
7. Anttila SS, Knuuttila ML, Sakki TK. Relationship of depressive symptoms to edentulousness, dental health, and dental health behavior. *Acta Odontol Scand*. 2001 Dec;59(6):406-12. <http://dx.doi.org/10.1080/000163501317153275>. PMID:11831492.
8. Almeida OP, Forlenza OV, Lima NK, Bigliani V, Arcuri SM, Gentile M, et al. Psychiatric morbidity among the elderly in a primary care setting report from a survey in São Paulo, Brazil. *Int J Geriatr Psychiatry*. 1997 Jul;12(7):728-36. [http://dx.doi.org/10.1002/\(SICI\)1099-1166\(199707\)12:7<728::AID-GPS624>3.0.CO;2-C](http://dx.doi.org/10.1002/(SICI)1099-1166(199707)12:7<728::AID-GPS624>3.0.CO;2-C). PMID:9251935.
9. Snowdon J. How high is the prevalence of depression in old age? *Rev Bras Psiquiatr*. 2002;24(suppl 1):42-7. <http://dx.doi.org/10.1590/S1516-44462002000500009>.
10. Anttila S, Knuuttila M, Ylostalo P, Joukamaa M. Symptoms of depression and anxiety in relation to dental health behavior and self-perceived dental treatment need. *Eur J Oral Sci*. 2006 Apr;114(2):109-14. <http://dx.doi.org/10.1111/j.1600-0722.2006.00334.x>. PMID:16630301.
11. Almeida OP, Almeida SA. Confiabilidade da versão brasileira da Escala de Depressão em Geriatria (GDS) versão reduzida. *Arq Neuropsiquiatr*. 1999 Jun;57(2B):421-6. <http://dx.doi.org/10.1590/S0004-282X1999000300013>. PMID:10450349.
12. Bertolucci PHF, Brucki SMD, Campacci SR, Juliano Y. O mini-exame do estado mental em uma população geral: impacto da escolaridade. *Arq Neuropsiquiatr*. 1994 Mar;52(1):1-7. <http://dx.doi.org/10.1590/S0004-282X1994000100001>. PMID:8002795.
13. Barros FC, Victora CG. Epidemiology of child health: a handbook for community diagnosis. 3rd ed. New York: UNICEF – Hucitec; 1998.
14. Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, Adey M, et al. Development and validation of a geriatric depression screening scale: a preliminary report. *J Psychiatr Res*. 1982-1983;17(1):37-49. [http://dx.doi.org/10.1016/0022-3956\(82\)90033-4](http://dx.doi.org/10.1016/0022-3956(82)90033-4). PMID:7183759.
15. Rosendo RA, Freitas CHSM. Diabetes Melito: dificuldades de acesso e adesão de pacientes ao Programa de Saúde da Família. *Rev Bras Ciênc Saude*. 2012;16(1):13-20.

16. Gomes R, Nascimento EF, Araújo FC. Por que os homens buscam menos os serviços de saúde do que as mulheres? As explicações de homens com baixa escolaridade e homens com ensino superior. *Cad Saude Publica*. 2007 Mar;23(3):565-74. <http://dx.doi.org/10.1590/S0102-311X2007000300015>. PMID:17334571.
17. Castro RD, Oliveira AGRC, Araújo IM. Estudo da acessibilidade organizacional aos serviços de saúde bucal de um município de pequeno porte do nordeste brasileiro. *Rev Bras Ciênc Saúde*. 2011;14(4):65-76.
18. Mendoza-Sassi R, Beria JU, Barros AJD. Outpatient health service utilization and associated factors: a population-based study. *Rev Saude Publica*. 2003 Jun;37(3):372-8. <http://dx.doi.org/10.1590/S0034-89102003000300017>. PMID:12792690.
19. Martins AMEBL, Barreto SM, Pordeus IA. Características associadas ao uso de serviços odontológicos entre idosos dentados e edentados no Sudeste do Brasil: Projeto SB Brasil. *Cad Saude Publica*. 2008 Jan;24(1):81-92. <http://dx.doi.org/10.1590/S0102-311X2008000100008>. PMID:18209836.
20. Kiyak HA. Explaining patterns of dental service utilization among the elderly. *J Dent Educ*. 1986 Nov;50(11):679-87. PMID:3464633.

CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

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