

## Smoking in elderly patients admitted to long-term care facilities\*

Tabagismo em idosos internados em instituições de longa permanência

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### Abstract

**Objective:** To determine the prevalence of smoking among elderly patients admitted to long-term care facilities (LTCFs) and to determine whether the degree of nicotine dependence is associated with sociodemographic variables, affective ties, motivation for smoking cessation and depression. **Methods:** Cross-sectional, population-based study involving 573 individuals over the age of 60, admitted to 13 LTCFs in the Federal District of Brasília, Brazil. We analyzed the following variables: type of LTCF, gender, age, level of education, monthly income, marital status, retirement status, affective ties, probable depression, motivation for smoking cessation and degree of nicotine dependence. In order to collect these data, the following instruments were used: a sociodemographic questionnaire; the Flanagan Quality of Life Scale; the Mini-Mental State Examination; the Geriatric Depression Scale; the Richmond test; and the Fagerström Test for Nicotine Dependence. **Results:** The prevalence of smokers in the study sample (573 individuals) was 23.0%. Of the 132 smokers, there were 90 males (25.8%) and 42 females (18.7%). Of these, 116 smokers were included in the study, 70 of whom (60.3%) presented with probable depression. The degree of nicotine dependence was found to be significantly associated with level of education, monthly income, affective ties, motivation for smoking cessation and probable depression, although not with the type of LTCF, gender, age, retirement status or marital status. **Conclusions:** Among elderly patients admitted to LTCFs in the Federal District of Brasília, the prevalence of smoking is high and the motivation for smoking cessation is low.

**Keywords:** Smoking; Homes for the aged; Health services for the aged.

### Resumo

**Objetivo:** Determinar a prevalência de tabagismo entre idosos internados em instituições de longa permanência para idosos (ILPIs) e verificar a associação do grau de dependência nicotínica com variáveis sociodemográficas, vínculo afetivo, motivação para cessação e depressão. **Métodos:** Estudo transversal de base populacional, incluindo 573 idosos com idade  $\geq 60$  anos, internados em 13 ILPIs no Distrito Federal. Foram analisadas as seguintes variáveis: tipo de ILPI, gênero, idade, escolaridade, renda mensal, estado civil, condição previdenciária, vínculo afetivo, motivação para a cessação, depressão provável e o grau de dependência nicotínica. Para a obtenção dos dados, foram utilizados os seguintes instrumentos: questionário sociodemográfico, Escala de Qualidade de Vida de Flanagan, Miniexame do Estado Mental, Escala de Depressão Geriátrica, teste de Richmond e Teste de Fagerström para Dependência de Nicotina. **Resultados:** A prevalência geral de fumantes na amostra (573 indivíduos) foi de 23,0%. Dos 132 fumantes, havia 81 homens (24,9%) e 35 mulheres (20,1%). Foram incluídos no estudo 116 fumantes, dos quais 70 (60,3%) apresentavam depressão provável. Houve significativas associações entre o grau de dependência nicotínica e as seguintes variáveis: escolaridade, renda mensal, vínculo afetivo, motivação para a cessação e depressão provável. Não houve associações significativas entre a dependência de nicotina e as seguintes variáveis: tipo de ILPI, gênero, idade, condição previdenciária e estado civil. **Conclusões:** Nos idosos institucionalizados em ILPIs no Distrito Federal, constatamos uma elevada prevalência de tabagismo, havendo entre eles baixa motivação para a cessação tabágica.

**Descritores:** Tabagismo; Instituição de longa permanência para idosos; Serviços de saúde para idosos.

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## Introduction

Although the benefits of smoking cessation are more evident among young individuals, smoking cessation at any age reduces the risk of death<sup>(1)</sup> and improves the general health status.<sup>(2)</sup> For instance, the life expectancy of elderly individuals aged 65 years or older who smoke up to one pack of cigarettes per day increases, after smoking cessation, by two to three years.<sup>(3)</sup> Among the benefits of smoking cessation in elderly individuals are decreased risk of developing an illness, better control of the evolution of preexisting diseases, improved quality of life and increased life expectancy, all of which underscore the relevance of smoking cessation efforts targeting this population.<sup>(2)</sup>

It is estimated that there are 1.0-1.5 million elderly smokers in Brazil.<sup>(4)</sup> An epidemiological study focusing on smoking in the southern region of the country found that the prevalence of smoking among individuals aged  $\geq 60$  years was 10.6%, and that this prevalence decreased as the age bracket increased.<sup>(5)</sup> A study involving individuals aged  $\geq 60$  years in the greater metropolitan area of Belo Horizonte, Brazil, and in the city of Bambuí, Brazil, revealed that the prevalence of smoking among males and females in Belo Horizonte was 19.6% and 8.1%, respectively, compared with 31.4% and 10.3%, respectively, in Bambuí.<sup>(6)</sup>

A study involving individuals over 64 years of age in the United States showed that, in 1999, 10.5% of the males and 10.7% of the females were smokers.<sup>(7)</sup> The *Encuesta Nacional de Salud de España* (National Health Study of Spain), conducted in 1997, showed that the prevalence of smoking among individuals over 15 years of age was 33.1%, 12% of the smokers being in the 65-74 year age bracket and 8% being over 74 years of age.<sup>(8)</sup>

Smoking is motivated by a complex relationship between environmental stimuli, personal habits, psychosocial conditioning and the biological effects of nicotine.<sup>(4)</sup> In this context, the study of smoking in assisted-living facilities constitutes a distinct field of research, because being in a long-term care facility (LTCF) precipitates the pathological processes to which elderly individuals are subject, since institutionalization commonly contributes to isolation, physical inactivity and mental inactivity, all of which have a negative

impact on the health of elderly individuals.<sup>(4)</sup> The possible associations between smoking and institutionalization should be investigated in order to gain a better understanding of this issue. However, studies investigating smoking in this population are scarce.

The objective of the present study was to determine the prevalence of smoking among elderly individuals residing in LTCFs in the Federal District of Brasília, Brazil, and to determine whether the degree of nicotine dependence is associated with sociodemographic variables, affective ties, motivation to stop smoking and depression.

## Methods

This was a cross-sectional, population-based study conducted in June of 2008 and involving individuals over the age of 60 residing in one of 13 LTCFs in the Federal District of Brasília, Brazil. We determined the prevalence of smoking and analyzed the associations between the degree of nicotine dependence and the following variables: type of LTCF; gender; age bracket; level of education; retirement status (yes/no); monthly income; marital status; affective ties; probable depression; and motivation to stop smoking.

The study sample was selected in accordance with the following inclusion criteria: being  $\geq 60$  years of age and being a smoker. Elderly individuals who did not achieve the following scores on the Mini-Mental State Examination (MMSE) were excluded:  $\geq 15$  for illiterate individuals;  $\geq 22$  for those with 1 to 11 years of schooling; and  $\geq 27$  for those with over 11 years of schooling.<sup>(9,10)</sup> The MMSE is a brief cognitive test that comprises items regarding time-space orientation, short-term memory, attention, calculation, language and constructional apraxia and that allows the mental state of individuals to be concisely evaluated. The MMSE is used worldwide and has versions in various languages and for use in various countries, including a Portuguese-language version that has been validated for use in Brazil.<sup>(10)</sup>

A total of 573 elderly individuals residing in LTCFs were evaluated. Of those 573 individuals, 132 were smokers. All eligible participants (elderly smokers) gave written informed consent to participate in the study. Of the 132 elderly smokers, 16 were excluded: 14 because they did not achieve the minimum MMSE score required;

and 2 because, although they had given written informed consent, they subsequently refused to participate in the study. Therefore, the final sample consisted of 116 elderly smokers.

Elderly smokers were identified through information provided by the local nursing staff. This information was cross-referenced with the information collected in the interviewer in order to identify possible discrepancies. The data were then compared with the information provided by the elderly individuals themselves. The study population was approached through individual interviews, during which the participants were informed that their answers were confidential. A pilot test was run with the purpose of evaluating the need for possible adjustments to the instruments used.

In order to calculate the prevalence of smoking according to gender and age bracket, we used the total population of smokers ( $n = 132$ ). For the remaining statistical analyses, we used the final study sample of smokers ( $n = 116$ ).

The participants of the present study answered a questionnaire regarding sociodemographic characteristics, including gender, age, level of education, retirement status, monthly income and marital status. They also completed the MMSE,<sup>(9)</sup> the Portuguese-language version of which has been validated for use in the Brazilian population.<sup>(10)</sup> The Geriatric Depression Scale,<sup>(11)</sup> in its shortened, Portuguese-language version validated for use in Brazil,<sup>(12)</sup> was used in order to identify individuals with a profile suggestive of depression. The Fagerström Test for Nicotine Dependence,<sup>(13)</sup> also translated to Portuguese and adapted for use in Brazil,<sup>(14)</sup> was used in order to determine the degree of nicotine dependence. The Richmond test<sup>(15)</sup> was applied in order to evaluate the motivation to stop smoking. In order to evaluate the presence of affective ties, we used some of the questions from the Flanagan Quality of Life Scale,<sup>(16)</sup> which has also been validated for use in Brazil.<sup>(17)</sup>

The results were analyzed with descriptive statistics (means and standard deviations). The dependent variable was the degree of nicotine dependence. The independent variables were sociodemographic variables—gender, age bracket, level of education, retirement status, monthly income (in number of times the national minimum wage), marital status and type of LTCF—and variables related to health status and

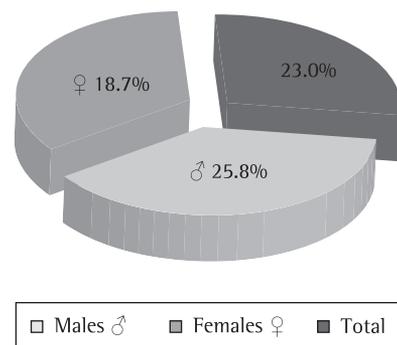
lifestyle—motivation to stop smoking, affective ties and probable depression.

The association between the degree of nicotine dependence and the other variables was determined in the bivariate analysis by the chi-square test, the level of significance being set at 5%. The variables that showed values of  $p < 0.20$  in the bivariate analysis were included in the multivariate analysis, and only the variables that showed values of  $p \leq 0.05$  remained in the final model. The statistical analysis was performed by the program *Statistical Package for the Social Sciences*, version 14.0 for Windows (SPSS Inc, Chicago, IL, USA).

The study design was approved by the Human Research Ethics Committee of the State Health Department of the Federal District of Brasília, Brazil. As previously mentioned, all participating subjects gave written informed consent.

## Results

The initial study population comprised 573 elderly individuals aged  $\geq 60$  years and residing in the 13 LTCFs under study. Of the total of elderly individuals, 349 were male, and 224 were female. Of those 573 individuals, 132 (90 males and 42 females) were smokers, and the mean age was  $70.0 \pm 7.1$  years. In accordance with the study criteria, we selected 116 elderly individuals for investigation. All of the subjects presented with normal cognitive status (mean MMSE score =  $22.3 \pm 3.8$  points), which was indispensable for obtaining reliable results in the tests and questionnaires applied. The overall prevalence of smoking was 23.0%, being



**Figure 1** – Prevalence of smoking, according to gender, among elderly individuals residing in a total of 13 long-term care facilities in the Federal District of Brasília, Brazil.

25.8% among males and 18.7% among females (Figure 1).

The prevalence of smoking in the 60-69 year age bracket was 52.3%. In the 70-79 year age bracket, the prevalence of smoking was 40.1%. Among elderly individuals aged 80 years or older, the prevalence of smoking was 7.6%. Although the prevalence of smoking decreased as age increased, this reduction was not statistically significant ( $p = 0.41$ ).

The subjects were not homogeneously distributed in terms of gender, the male gender predominating ( $n = 81$ ; 69.8%). Individuals aged 80 years or older accounted for only 8.6% of the study sample.

Of the 116 elderly smokers residing in the LTCFs, 90 (77.6%) presented with either a moderate or high degree of nicotine dependence

(51.7% and 25.9%, respectively), and 57.7% presented with low motivation to stop smoking. The prevalence of probable depression in elderly smokers was 60.3%, and those 70 individuals were concentrated in the groups of moderate and high degree of nicotine dependence.

Regarding the sociodemographic variables, the degree of nicotine dependence did not correlate significantly with the type of LTCF, gender, age bracket, retirement status or marital status, although it did correlate significantly with monthly income and level of education (Table 1).

The association between the degree of nicotine dependence and variables related to health status and lifestyle was significant for affective ties, motivation to stop smoking and probable depression (Table 2).

**Table 1** - Associations between the degree of nicotine dependence and sociodemographic variables in the sample of institutionalized elderly smokers.

Variable	Degree of nicotine dependence			Total, n	p
	Low, n (%)	Moderate, n (%)	High, n (%)		
Type of institution					
Private	16 (13.8)	37 (31.9)	20 (17.2)	73	0.88
Public	10 (8.6)	23 (19.8)	10 (8.6)	43	
Gender					
Male	17 (14.7)	41 (35.3)	23 (19.8)	81	0.61
Female	9 (7.8)	19 (16.4)	7 (6)	35	
Age bracket, years					
60-69	17 (14.7)	30 (25.9)	12 (10.3)	59	0.41
70-79	8 (6.9)	24 (20.7)	15 (12.9)	47	
≥ 80	1 (0.9)	6 (5.2)	3 (2.6)	10	
Schooling					
None	1 (0.9)	10 (8.6)	14 (12.1)	25	0.001
1-3 years	3 (2.6)	22 (19)	13 (11.2)	38	
4-7 years	10 (8.6)	11 (9.5)	1 (0.9)	22	
8-11 years	6 (5.2)	12 (10.3)	2 (1.7)	20	
≥ 12 years	6 (5.2)	5 (4.3)	-	11	
Retirement status					
Retired	2 (1.7)	5 (4.3)	4 (3.4)	11	0.7
Not retired	24 (20.7)	55 (47.4)	26 (22.4)	105	
Monthly income, number of times the national minimum wage					
< 1 ×	46 (39.7)	13 (11.2)	23 (19.8)	80	0.003
1-2 ×	10 (8.6)	11 (9.5)	3 (2.6)	26	
3-4 ×	4 (3.4)	2 (1.7)	4 (3.4)	10	
Marital status					
Single	7 (6)	23 (19.8)	9 (7.8)	39	0.61
Married	-	2 (1.7)	1 (0.9)	3	
Widowed	10 (8.6)	13 (11.2)	11 (9.5)	34	
Separated	9 (7.8)	22 (19)	9 (7.8)	40	
Total	26 (22.4)	60 (51.7)	30 (25.9)	116	

**Table 2** – Association between the degree of nicotine dependence and variables related to health status and lifestyle in the sample of institutionalized elderly smokers.

Variable	Degree of nicotine dependence			Total, n	p
	Low, n (%)	Moderate, n (%)	High, n (%)		
Affective ties					
Yes	3 (2.6)	23 (19.8)	17 (14.7)	43	0.002
No	23 (19.8)	37 (31.9)	13 (11.2)	73	
Motivation					
Low	9 (7.8)	30 (25.9)	28 (24.1)	67	0.001
Moderate	8 (6.9)	25 (21.6)	2 (1.7)	35	
High	9 (7.8)	5 (4.3)	-	14	
Probable depression					
Yes	8 (6.9)	35 (30.2)	27 (23.3)	70	0.001
No	18 (15.5)	25 (21.6)	3 (2.6)	46	
Total	26 (22.4)	60 (51.7)	30 (25.9)	116	

In the multivariate model, the following variables remained statistically significant: level of education ( $p = 0.001$ ); monthly income ( $p = 0.05$ ); affective ties ( $p = 0.002$ ); motivation to stop smoking ( $p = 0.001$ ); and probable depression ( $p = 0.001$ ).

## Discussion

In the present study, the prevalence of smoking among institutionalized elderly individuals aged 60 years or older was 23% (25.8% among males and 18.7% among females). In the literature, we found only two studies investigating the prevalence of smoking among elderly individuals in assisted-living facilities. One of the studies, conducted in 2004, reported the prevalence of smoking to be 14%,<sup>(18)</sup> compared with 11% reported in the other study, conducted in 2008.<sup>(19)</sup> The latter investigated only individuals aged 65 years or older. The difference between the results of those studies is probably due to the differences in the distribution of the genders in the populations studied. In general, the prevalence of smoking is lower in study samples in which the female gender predominates. In the two studies cited above, females accounted for 64% and for 75% of the sample, respectively.<sup>(18,19)</sup> The association between the predominance of the female gender and a lower prevalence of smoking is in accordance with the sociocultural profile of the generation in question, according to which males smoke more than do females, regardless of age.

Other studies investigating the prevalence of smoking in the elderly population have involved individuals in the general population (i.e., noninstitutionalized elderly individuals). Although the prevalence of smoking varied among those studies, the lowest value reported was 14%.<sup>(6,20-23)</sup>

A cross-sectional, population-based study investigating elderly individuals in the city of Pelotas, Brazil, reported the prevalence of smoking to be 14%.<sup>(21)</sup> Another study showed that approximately 3.5 million elderly individuals aged 65 years or older in the United States smoke, the overall prevalence of smoking among elderly individuals being 26% (40% among males and 12% among females).<sup>(20)</sup>

In the present study, when stratifying the prevalence of smoking by gender, the values we obtained (25.8% among males and 18.7% among females) were similar to those reported in the literature. For example, high rates were observed among elderly males in the greater metropolitan area of Belo Horizonte, Brazil (19.6%), as well as in the city of Bambuí, Brazil (31.4%).<sup>(6)</sup> However, in that study, the prevalence of smoking among females was 8.1% in Belo Horizonte and 10.3% in the city of Bambuí, values that are approximately 2.5 times lower than that found in the present study. This is probably attributable to the influence of institutionalization on the prevalence of smoking. Therefore, it is likely that there is a general trend toward a higher prevalence of smoking among elderly individuals who are institutionalized. We suspect that factors such as the absence of affective ties,

together with depression, less social and medical pressure to stop smoking, fewer opportunities, low self-efficacy and lack of productive activity can reinforce the smoking habit.

Another relevant aspect of the prevalence of smoking in elderly individuals is that it decreases as the age bracket increases. In the present study, the prevalence of smoking was 50.9% among individuals in the 60–69 year age bracket, 40.5% among those in the 70–79 year age bracket and only 8.6% among those aged 80 years or older. This corroborates, in part, the findings of studies investigating noninstitutionalized elderly individuals.<sup>(5,6)</sup>

In the present study, there was no significant association between gender and nicotine dependence. However, the disparity between the proportion of males and the proportion of females under study might explain this fact. Moderate dependence predominated among males and females, and males predominated in the group of individuals with high dependence.

Moderate nicotine dependence predominated regardless of the age bracket analyzed. Among elderly individuals in the 70–79 year age bracket and among those aged 80 years or older, high dependence was more common than was low dependence. This finding suggests that tobacco dependence tends to increase with age. This might be explained by the longer duration of exposure to nicotine.

The present study revealed a significant association between the level of education and the degree of nicotine dependence. Among the elderly individuals evaluated, nicotine dependence decreased in inverse proportion to the number of years of schooling. A similar finding was reported in another study.<sup>(5)</sup> However, this finding is in disagreement with those of yet another study, in which smoking was found to be significantly associated with a lower level of education among younger individuals but not among older individuals.<sup>(22)</sup> In that study, the lack of an association between the level of education and smoking among the elderly individuals evaluated was attributed to a possible survival bias, since premature death is expected to occur more frequently among smokers in the lower socioeconomic strata.<sup>(22)</sup>

We found no statistical association between the degree of nicotine dependence and retirement status, although we did find an

inverse association between monthly income and the degree of nicotine dependence. Therefore, for the population under study, it is unlikely that retirement status is a determinant of the degree of nicotine dependence. However, when we stratified the monthly income of elderly individuals (in number of times the national minimum wage), we found a significant association. A study conducted in Brazil in 2004 showed that individuals with little schooling were 5 times more likely to become smokers, and that the consumption of cigarettes was greater in the lower socioeconomic classes.<sup>(24)</sup>

In the present study, marital status, per se, was not found to be associated with the degree of nicotine dependence. However, there was a significant association between affective ties and the degree of nicotine dependence. Therefore, elderly individuals who maintain any type of affective ties are apparently less dependent on nicotine.

In the present study, the association between the degree of nicotine dependence and the level of motivation to stop smoking was statistically significant. It has been reported that these factors are interconnected, and individual motivation is one of the most relevant factors for definitive smoking cessation, being interrelated with a range of hereditary, psychological, physiological and environmental variables.<sup>(23)</sup>

In the present study, low motivation to stop smoking was found in the group of individuals with high nicotine dependence, and highly motivated elderly individuals were concentrated in the group of individuals with low dependence. This result is in disagreement with those presented by another author, who demonstrated that smokers with low or moderate dependence can present with low motivation to stop smoking, since some of them believe they can quit whenever they want to. The same author stated that smokers with a high degree of dependence can also present with low motivation due to their lack of confidence in their ability to succeed; they believe they are incapable of quitting and are afraid of suffering from withdrawal syndrome, since their previous attempts have been unsuccessful.<sup>(25)</sup>

We found a significant correlation between the degree of nicotine dependence and probable depression. Among the elderly individuals whose Geriatric Depression Scale scores were indicative

of depression, moderate and high nicotine dependence predominated. This is in agreement with the findings of other studies.<sup>(21,26,27)</sup> One of those studies showed that there is a well-established association between nicotine dependence and the various forms of anxiety and depressive disorders.<sup>(27)</sup> However, there is controversy regarding the role that smoking plays in the onset of depression.<sup>(28)</sup> In our study, the predominance of depressive symptoms in the group of elderly individuals with a high degree of nicotine dependence might encourage other researchers to conduct further neurobiological and epidemiological studies focusing exclusively on the relationship between smoking and depression.

Regarding the degree of nicotine dependence, 77.6% of the elderly individuals residing in the LTCFs presented with either a moderate or high degree of dependence (51.7% and 25.9%, respectively), constituting a clientele that is difficult to target in smoking cessation interventions. In order to do so, appropriate preliminary strategic planning is required in order to increase the probability of success. Of the elderly individuals evaluated, 57.7% presented with low motivation to stop smoking. This finding corroborates our data regarding the degree of nicotine dependence, demonstrating that there are two major obstacles to the success of smoking treatment in institutionalized elderly individuals.

We found that the degree of nicotine dependence was not significantly associated with gender, age bracket, retirement status, marital status or LTCF type. However, the degree of nicotine dependence was significantly associated with the remaining variables, both in the bivariate analysis and in the multivariate model. We believe that institutionalization can contribute to the perpetuation of smoking, due to abandonment by the family, possible abuse and limited access to qualified health professionals from the fields of geriatrics and gerontology, as well as to the loneliness that members of this population often experience in LTCFs.

We consider this study to be a wakeup call regarding the issue of smoking among elderly individuals residing in LTCFs, since we have shown that smoking constitutes a public health problem among institutionalized elderly individuals in the Federal District of Brasília,

Brazil. We emphasize the need to conduct similar studies in other localities in the country. We have identified a gap to be filled in the scientific literature regarding the possible peculiarities of this population. Smoking has a multifaceted and multifactorial nature and, due to the various influences of the environment into which they are inserted, elderly individuals who are institutionalized might respond differently to the determinants of nicotine dependence than do those who are not institutionalized.

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