

# Demographic, health conditions, and lifestyle factors associated with urinary incontinence in elderly from Florianópolis, Santa Catarina, Brazil

## *Fatores demográficos, condições de saúde e hábitos de vida associados à incontinência urinária em idosos de Florianópolis, Santa Catarina*

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**ABSTRACT:** *Objective:* To determine the prevalence and factors associated with urinary incontinence in the elderly population of Florianópolis, in the State of Santa Catarina, Brazil. *Methods:* We used data from EpiFloripa Idoso 2009/2010 survey, a cross-sectional population-based study including 1,705 elderly of both the sexes. Poisson's regression (crude and adjusted analysis) was applied to verify the association between the urinary incontinence outcome and exploratory variables (sociodemographic, lifestyle, and health conditions). *Results:* Among the elderly, 29.4% reported urinary incontinence; 36.3% were women and 17.0% men. The factors associated with greater prevalence of urinary incontinence were being female, aged more than 70 years old, having 0 to 4 schooling years, being insufficiently active, having bronchitis or asthma, stroke or cerebral ischemia, presenting mild or moderate/severe dependence, and polypharmacy. *Conclusion:* The prevalence of urinary incontinence was high among the investigated elderly. Sociodemographic variables and those related to lifestyle and health conditions were associated with higher prevalence of urinary incontinence. Knowledge of the factors associated with urinary incontinence in aged individuals can guide actions to reduce and prevent this important issue, which affects the elderly.

**Keywords:** Urinary incontinence. Elderly. Risk factors. Demographic data. Health conditions. Life style.

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**Conflict of interests:** nothing to declare – **Financial support:** This article was originated at Project EPIFLORIPA 2009/2010 – Epidemiological Study of Health Conditions of Elderly in Florianópolis, Santa Catarina, financed by the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), process number 569834/2008-2.

**RESUMO:** *Objetivo:* Determinar a prevalência e os fatores associados à incontinência urinária na população idosa de Florianópolis, no Estado de Santa Catarina. *Métodos:* Foram utilizados dados do inquérito EpiFloripa Idoso 2009/2010, que foi um estudo transversal de base populacional, com 1.705 idosos, de ambos os sexos. Utilizou-se a regressão de Poisson bruta e ajustada para verificar a associação entre o desfecho incontinência urinária e as variáveis exploratórias (sociodemográficas, hábitos de vida e condições de saúde). *Resultados:* Dentre os idosos, 29,4% relataram perda urinária, sendo 36,3% no sexo feminino e 17,0% no masculino. Os fatores associados a maior prevalência de incontinência urinária foram: ser do sexo feminino, idade maior de 70 anos, ter zero a quatro anos de estudo, ser insuficientemente ativo, ter bronquite ou asma, ter derrame ou acidente vascular cerebral ou isquemia cerebral, ter dependência leve ou moderada/grave e polifarmácia. *Conclusão:* A prevalência de incontinência urinária foi elevada nos idosos investigados, sendo que as variáveis sociodemográficas, e aquelas relacionadas aos hábitos de vida e às condições de saúde foram independentemente associadas a maior prevalência de incontinência urinária. O conhecimento dos fatores associados à incontinência urinária em idosos pode orientar as ações direcionadas à redução e prevenção deste importante problema que acomete a população mais idosa.

**Palavras-chave:** Incontinência urinária. Idoso. Fatores de risco. Dados demográficos. Condições de saúde. Estilo de vida.

## INTRODUCTION

Urinary incontinence (UI) is defined by the International Continence Society as any involuntary loss of urine. It can be classified into stress, urge, mixed, overflow, and total. Stress UI, defined as the involuntary loss of urine during exercise, coughing, or sneezing, is the most frequent, whereas the urge UI is characterized by urinary loss accompanied by a strong urge to urinate. When these occur simultaneously, it is defined as mixed incontinence. The overflow happens when the urine volume exceeds the maximum bladder capacity and the total when the loss is continuous<sup>1</sup>.

In the literature, the prevalence of urinary incontinence among the elderly varies from about 2.5 to 60%<sup>2-5</sup>. This difference is attributed to the divergence of the concept of incontinence, different population samples, and variations in the formulation of data collection instruments<sup>6</sup>. Erroneously, UI can be considered part of the natural aging process, since alterations in the urinary tract predispose its occurrence. This condition may cause embarrassment and make living with the incontinence permanent. In addition to affecting physical, social, psychological, occupational, domestic, and sexual aspects of the individual, UI leads to isolation and impaired quality of life<sup>7,8</sup>.

There are multiple risk factors for the development of UI, such as advanced age<sup>9</sup>, parity, vaginal delivery, low estrogen levels at menopause, being female, treatment of prostate cancer, and physical and mental disabilities<sup>10</sup>.

Some diseases such as cerebrovascular accident (CVA), Parkinson's disease, diabetes mellitus, and heart failure<sup>9</sup>, in addition to medications and surgery, which can potentially cause lower pelvic muscle tone or generate nerve damage, may exacerbate or lead to UI<sup>10</sup>.

There are several possible treatments, surgical or not. However, the costs are high. In the United States, approximately US\$ 19.5 billion were spent on UI, with US\$ 5.3 billion being performed by institutionalized residents<sup>11</sup> in 2000. In Brazil, female patients with UI spend an average of R\$ 2,208.00, since the beginning of symptoms up to referral to treatment. In the same study, R\$ 165,347.76 were spent by the health system for the diagnosis and treatment of 645 patients. These costs tend to increase with the aging population and the prevalence of female sex<sup>12</sup>.

The loss of UI is a public health issue, besides the aforementioned factors that affect the life of the elderly, generating individual and government costs. In addition, the family has daily expenses, especially with diapers or other devices<sup>12</sup>.

Considering the importance of the issue and how UI may affect the life and health of the elderly and generate public health spending, the study aimed to determine the prevalence of UI in a representative sample of the elderly population in Florianópolis, in the State of Santa Catarina, Brazil, and identify sociodemographic factors, lifestyle habits, and health conditions associated to this problem.

## METHODS

This work is part of the cross-sectional observational and population-based study named EpiFloripa Elderly, conducted with residents of the urban area of Florianópolis, aged older than 60 years, in 2009<sup>13</sup>.

Data were collected from September 2009 to June 2010 through individual interviews in households. Engineers, teachers, researchers, graduate, doctoral and undergraduate students, and interviewers participated. There was a training, test, and supervised interview before joining the team.

Sample selection occurred by clusters, in two stages. The units of the first stage were census tracts. The 420 urban sectors of Florianópolis, according to the Census of 2000, were arranged in ascending order of income (R\$ 192.80 – R\$ 13,209.50), and 80 of these sectors were systematically drawn (eight in each income decile).

The units of the second stage were households. An update step of their number in each sector (enrollment) was necessary, as the most recent census was conducted in 2000. Only the home addresses permanently occupied were registered.

The number of households per sector varied from 61 to 725. In order to reduce the coefficient of variation in the number of households per sector from 52.7 ( $n = 80$  sectors) to 35.2% ( $n = 83$  sectors), a grouping of very small sectors was held, considering the geographical location and the corresponding income decile, as well as the division of very large areas. It was estimated to visit 60 households at each one in order to find 20 elderly.

The estimated sample size was performed for prevalence studies, with the following parameters: population size of 44.460<sup>14</sup>, unknown prevalence (50%), sampling error of four percentage points, 95% confidence interval, design effect of two, 20% increase for eventual

losses and refusals, and 15% for association studies. This resulted in a minimum sample of 1,599 individuals. Calculations were performed using the Epi-Info 6.04 program (Centers for Disease Control and Prevention, USA). All elderly residents in the selected households were eligible for the study; thus, the sample was expanded to 1,911 subjects.

The elderly at long-term care facilities or hospitals that have been visited up to four times, including weekends and evenings, were not included. Those who were not found were considered losses and those who refused to answer, refusals.

The instrument for data collection was standardized and previously tested with 30 elderly, face to face. The data were directly included in portable digital devices (PDA) and subsequently exported to Stata 12.0 (Stata Corporation, College Station, USA).

Quality control was performed by applying a reduced questionnaire by telephone with 10% of the elderly, which were randomly selected. The reproducibility of the questions presented satisfactory agreement, with kappa values between 0.6 and 0.9.

This article has UI as dependent variable, based on the question "Is it common for you to lose a bit of urine and accidentally get wet; either because there was not enough time to get to the bathroom, or because you were sleeping; or when you cough or sneeze, or push something?" Answers may be positive or negative.

The independent variables were sociodemographic, such as sex (male or female), age (60–69, 70–79 and 80 or older), schooling (no formal schooling, 1–4, 5–8, 9–11 or 12 or more years of schooling); health and life habits, such as self-rated health (very good/good, fair, and poor/very poor), smoking (never smoked, smoked and stopped, or currently smokes), nutritional status (underweight, normal weight, and overweight), physical activity for leisure or displacement (insufficiently active and physically active); and self-reported morbidities, such as diabetes mellitus, bronchitis or asthma, hypertension, cardiovascular diseases, stroke, CVA or cerebral ischemia, in addition to cognitive impairment (yes or no), depressive symptoms (yes or no), degree of dependence (absent, mild to moderate, and severe), and polypharmacy (yes or no).

Nutritional status was calculated using the body mass index (BMI). The measurements were taken during the interview, and the result of the body weight in kilograms divided by the square of the height was classified according to the Food and Nutrition Surveillance in 2011<sup>15</sup>. The cutoff points established for the elderly to be nutritionally diagnosed with low weight were  $BMI \leq 22 \text{ kg/m}^2$ , appropriate weight when  $> 22$  and  $< 27 \text{ kg/m}^2$ , and overweight when  $\geq 27 \text{ kg/m}^2$ .

Physical activity was measured using the International Physical Activity Questionnaire (IPAQ)<sup>16</sup>, and seniors who reported 150 minutes or more of exercise per week were classified as physically active. Those who practiced less than 150 minutes per week were considered insufficiently active in the domain of leisure and displacement.

Cognitive impairment was assessed by the Mini Mental State Examination (MMSE) of Folstein, using the level of schooling to define the cutoff points for likely cognitive impairment (yes or no)<sup>17</sup>. The 15-question reduced version of the Geriatric Depression Scale (GDS-15) was used to assess the presence of depressive symptoms, in which individuals with six or more points were considered depressive<sup>18</sup>.

For the evaluation of the degree of dependence, the Scale of Activities of Daily Living (ADL) of BOMFAQ/OARS<sup>19</sup> was used, which assesses the functional capacity through 15 questions about basic activities of daily living (ADL) and instrumental activities of daily living (IADL). The absence of disability was considered when the elderly reported no difficulties in any of the ADLs, mild when showing inability/difficulty to perform between one to three activities, and moderate/severe when having disability/difficulty in four or more activities.

Regarding polypharmacy, it was considered as the concomitant use of five or more medicines in the last 30 days<sup>20</sup>.

It was performed a descriptive statistic of the UI variables according to the nature of the exhibits. For the crude and adjusted analysis, Poisson's<sup>21</sup> regression was applied to estimate prevalence ratios (PR) and their respective confidence intervals (95%CI). In the adjusted analysis, a hierarchical model was used in which, at the first level, the demographic and socioeconomic variables were included; the living habits integrated the second level; and, finally, those related to health conditions, more proximal to the outcome. The entry of the variables in the adjusted model was made by these levels, including those with  $p < 0.20$ ; all those who presented  $p < 0.05$  were maintained. Data analysis was performed using Stata 12.0 (Stata Corporation, College Station, USA), considering the effect of the sampling design by clusters and incorporating the sampling weights.

The project was approved by the Ethics Committee of the Federal University of Santa Catarina, under protocol 352/2008, on December 23, 2008, and funded by the National Council of Technological and Scientific Development (CNPq), under file number 569834/2008-2.

## RESULTS

Of the eligible elderly ( $n = 1,911$ ), 1,705 were interviewed, and the response rate was 89%. The average age of those interviewed was 71 years (median: 69 years), ranging from 60 to 104 years, and more than half were women.

Many of the elderly had 1 to 4 years of schooling, and more than 60% reported never having smoked. Almost half were considered insufficiently active. Many reported difficulty/dependence on one or more ADLs, showed normal cognitive performance, and no depressive symptoms. Among self-reported morbidities, systemic arterial hypertension stands out. Still, most of the elderly were overweight/obese, did not use polypharmacy, and reported very good or good health perception. Table 1 includes the description of the sample.

Among those interviewed, 1,700 answered the question of UI, totaling 99.7% of respondents. The prevalence of UI was found to be 29.4% ( $n = 499$  elderly, 95%CI 27.2 – 31.5), 36.3% among women and 17.0% men; 45.1% in the elderly were aged older than 80 years and 40.3% among those with no schooling (Table 1).

It was also observed that the elderly who did not smoke, were insufficiently active, and with moderate/severe dependency level or cognitive disabilities showed a higher prevalence of UI (Table 1).

Table 1. Descriptive, bivariate, crude, and adjusted analysis according to urinary incontinence in elderly, Florianópolis, Santa Catarina, Brazil (2009/2010).

Variable	n (%)	UI Prevalence (95%CI)	Crude PR (95%CI)	p-value	Adjusted PR* (95%CI)
Sex (n = 1,705)					
Male	616 (36.1)	17.0 (14.0 – 19.9)	1.00	< 0.001	1.00
Female	1.089 (63.9)	36.3 (33.5 – 39.2)	2.21 (1.72 – 2.83)		2.05 (1.59 – 2.66)
Age (n = 1,705)					
60 – 69 years	854 (50.1)	21.7 (18.9 – 24.5)	1.00	< 0.001	1.00
70 – 79 years	612 (35.9)	33.9 (30.2 – 37.7)	1.67 (1.32 – 2.11)		1.53 (1.23 – 1.91)
80 years or more	239 (14.0)	45.1 (38.8 – 51.5)	1.92 (1.51 – 2.46)		1.70 (1.29 – 2.22)
Schooling (n = 1,694)					
12 years or more	394 (23.3)	19.8 (15.8 – 23.7)	1.00	< 0.001	1.00
9 – 11 years	234 (13.8)	25.6 (20.0 – 31.3)	1.07 (0.67 – 1.71)		0.89 (0.56 – 1.42)
5 – 8 years	321 (18.9)	30.6 (25.5 – 35.7)	1.50 (1.10 – 2.05)		1.22 (0.89 – 1.68)
1 – 4 years	584 (34.5)	33.3 (29.5 – 37.1)	1.68 (1.28 – 2.19)		1.38 (1.03 – 1.84)
0 years	161 (9.5)	40.3 (32.8 – 48.0)	2.36 (1.63 – 3.43)		1.73 (1.14 – 2.64)
Smoking (n = 1,703)					
Never smoked	1.039 (61.0)	32.2 (29.4 – 35.1)	1.54 (1.03 – 2.30)	0.070	1.10 (0.71 – 1.17)
Smoked and stopped	523 (30.7)	25.3 (21.5 – 29.0)	1.24 (0.87 – 1.77)		1.20 (0.77 – 1.84)
Still smokes	141 (8.3)	22.7 (15.7 – 29.7)	1.00		1.00
Physical activity† (n = 1,705)					
Physically active	868 (50.9)	22.3 (19.5 – 25.0)	1.00	< 0.001	1.00
Insufficiently active	837 (49.1)	36.7 (33.5 – 40.0)	1.66 (1.39 – 1.98)		1.25 (1.04 – 1.49)
Dependence (n = 1,705)					
Absent	458 (26.9)	15.7 (12.4 – 19.1)	1.00	< 0.001	1.00
Mild	709 (41.6)	24.3 (21.1 – 27.4)	1.69 (1.20 – 2.38)		1.43 (1.03 – 1.99)
Moderate/severe	538 (31.6)	47.8 (43.6 – 52.1)	3.23 (2.43 – 4.31)		1.93 (1.39 – 2.68)
Cognitive deficiency (n = 1,692)					
No	880 (52.0)	24.9 (22.0 – 27.8)	1.00	< 0.001	1.00
Yes	812 (48.0)	33.8 (30.6 – 37.1)	1.39 (1.16 – 1.66)		1.07 (0.88 – 1.30)
Depressive symptoms (GDS) (n = 1,635)					
No	1.410 (86.2)	26.1 (23.8 – 28.4)	1.00	< 0.001	1.00
Yes	225 (13.8)	45.1 (38.5 – 51.7)	1.71 (1.33 – 2.20)		1.03 (0.83 – 1.28)

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Table 1. Continuation.

Variable	n (%)	UI Prevalence (95%CI)	Crude PR (95%CI)	p-value	Adjusted PR* (95%CI)
<b>Diabetes (n = 1,705)</b>					
No	1.329 (77.9)	26.9 (24.6 – 29.3)	1.00	0.001	1.00
Yes	376 (22.1)	37.9 (32.9 – 42.8)	1.41 (1.16 – 1.73)		1.10 (0.89 – 1.37)
<b>Bronchitis or asthma (n = 1,705)</b>					
No	1.437 (84.3)	27.2 (24.9 – 29.5)	1.00	< 0.001	1.00
Yes	268 (15.7)	40.7 (34.8 – 46.6)	1.67 (1.32 – 2.11)		1.38 (1.09 – 1.75)
<b>Hipertension (n = 1,705)</b>					
No	698 (40.9)	23.8 (20.6 – 26.9)	1.00	< 0.001	1.00
Yes	1.007 (59.1)	33.2 (30.3 – 36.2)	1.46 (1.22 – 1.75)		0.95 (0.76 – 1.17)
<b>Cardiovascular diseases (n = 1,705)</b>					
No	1.227 (72.0)	27.1 (24.6 – 29.6)	1.00	< 0.001	1.00
Yes	478 (28.0)	35.1 (30.8 – 39.4)	1.36 (1.15 – 1.61)		0.93 (0.75 – 1.17)
<b>Stroke, CVA, or cerebral ischemia (n = 1,704)</b>					
No	1.553 (91.1)	27.6 (25.4 – 29.8)	1.00	< 0.001	1.00
Yes	151 (8.9)	47.6 (39.5 – 55.8)	1.94 (1.52 – 2.50)		1.46 (1.13 – 1.90)
<b>Nutritional state (n = 164)</b>					
Low weight	141 (8.6)	23.4 (16.3 – 30.5)	1.00	0.017	1.00
Adequate weight	637 (38.7)	24.9 (21.6 – 28.3)	1.02 (0.76 – 1.36)		1.25 (0.90 – 1.73)
Overweight	868 (52.7)	31.8 (28.7 – 34.9)	1.30 (0.97 – 1.72)		1.34 (0.95 – 1.89)
<b>Polypharmacy (n = 1,705)</b>					
No	932 (54.7)	20.0 (17.4 – 22.6)	1.00	< 0.001	1.00
Yes	773 (45.3)	40.6 (37.2 – 44.1)	1.92 (1.63 – 2.26)		1.29 (1.04 – 1.60)
<b>Self-rated health (n = 1,681)</b>					
Very good/good	860 (51.2)	22.5 (19.7 – 25.3)	1.00	< 0.001	1.00
Regular	646 (38.4)	32.2 (28.6 – 35.8)	1.51 (1.24 – 1.84)		1.00 (0.80 – 1.24)
Poor/very poor	175 (10.4)	48.3 (40.8 – 55.8)	2.24 (1.77 – 2.84)		1.05 (0.78 – 1.42)

\*Level 2 adjusted for sex, age, and schooling; level 3 adjusted for variables in model 1 and physical activity; †Leisure and displacement; CVA: stroke; UI: urinary incontinence; PR: prevalence ratio.

The prevalence of UI was also higher in the subjects identified with depressive symptoms and in those who reported diabetes, bronchitis or asthma, hypertension, cardiovascular diseases, and stroke, CVA, or cerebral ischemia. The UI was also more prevalent in elderly who were overweight and used polypharmacy or in those who rated their health as poor/very poor (Table 1).

In the crude analysis, it was noted that the UI was significantly associated with being female, aging 80 years or more, no schooling, being insufficiently active, having moderate/severe dependency, presenting cognitive impairment, showing depressive symptoms, having diabetes, bronchitis or asthma, hypertension, cardiovascular diseases, stroke, CVA, or cerebral ischemia, overweight, using polypharmacy, and having a poor/very poor self-rated health (Table 1).

In the adjusted analysis, the variables that remained associated with the outcome were gender, age, schooling, physical activity, functional capacity, having bronchitis or asthma, stroke, CVA, or cerebral ischemia, and polypharmacy. Being female increased twice the prevalence of UI. Seniors aging 70–79 years and 80 or older had a 53 and 70% higher prevalence of UI, respectively. Individuals who reported bronchitis or asthma and those who reported stroke or cerebral ischemia had a 36 and 48% higher prevalence of UI, respectively. Similarly, it was 43% higher in elderly with mild dependence and nearly twice as high in those with a level of moderate/severe dependency. Moreover, the participants who used polypharmacy had 29% higher prevalence of outcome (Table 1).

## DISCUSSION

In the present study, it was observed that the prevalence of UI (29.4%) was associated with female sex, older age, low schooling, being insufficiently active, presenting mild to severe disability, having bronchitis or asthma, stroke, CVA, or brain ischemia, and use of polypharmacy.

The prevalence of UI is congruent to the literature<sup>2,4</sup>. According to a survey conducted with 479 elderly in the city of Porto Alegre, Rio Grande do Sul<sup>5</sup>, 24% have urinary loss. However, in a study conducted in the city of Uberaba, Minas Gerais, among 2,142 of the elderly investigated, 11% reported having UI<sup>2</sup>. The difference between the observed prevalence rates may be attributed to different approaches used regarding how to diagnose UI (self-reference or clinical examination) and the size of the sample<sup>6</sup>.

The prevalence of UI among sexes in the study conducted in Porto Alegre was higher in women (56.4%) than men (28.8%)<sup>5</sup>. In Uberaba, among those who reported having UI, 69.5% were women and 30.5% were men<sup>2</sup>. Therefore, in both investigations, women appear to be the most affected, which corroborates the results of the present investigation.

The literature shows that the highest prevalence of UI in women is because of the difference in urethral length between female and male, the anatomy of the pelvic floor, the effects of pregnancy and delivery in continence mechanisms, and hormonal alterations, characterized



by exhaustion of ovarian follicles and progressive hypoestrogenism<sup>4,22</sup>. Viegas et al.<sup>5</sup> state that the proportion of incontinent women is higher in virtually all studies and explain the possibility of ethnic and methodological differences by the lower prevalence reported in some studies.

The most affected age group among the elderly population to in the study by Araújo et al.<sup>23</sup> was 60-69 years. In the study by Bolina et al.<sup>2</sup>, the highest prevalence of UI was between 70 and 80 years. In the present study, those aging 70 years or older had a higher prevalence of UI, more than 50%. Although the elderly are the most affected by UI, there is disagreement between the studies regarding the specific age group.

According to Araújo et al.<sup>23</sup>, UI increases with age. The association between aging and UI can be partially explained by ultrastructural changes in detrusor muscle, such as the development of fibrosis and hypersensitivity to norepinephrine, which cause involuntary contractions of the muscle<sup>24</sup>.

In this study, less schooling (0 and 1 to 4 years) was associated with higher prevalence of UI, which is similar to the literature<sup>4,23</sup>. Bolina et al.<sup>2</sup> demonstrated that the absence of schooling was associated with 83% higher chance of having UI. The lower access to information may enhance the understanding that UI is a natural consequence of aging, besides showing an inequality, in which there is difficulty of access to preventive and therapeutic measures of UI<sup>7,25</sup>.

Regarding physical activity, a study conducted in Florianópolis with 39 women aged 60 years or more identified the tendency of elderly with no regular practice to present urge UI<sup>26</sup>. Other studies<sup>3,27</sup> found an association between physical exercise and lower UI rates. In the present investigation, insufficient physical activities were associated with 25% higher prevalence of UI, which meets the aforementioned investigations.

Physical activity acts positively in the mechanism of continence, because exercises have a strong influence in maintaining body weight and preventing obesity, as adiposity may cause chronic increase of intra-abdominal pressure and weaken the pelvic support structures<sup>28</sup>. In addition, strength training may increase the volume of the pelvic floor muscles, making them able to contract at certain moments during the expansion in intra-abdominal pressure. Another note is that more active seniors have better physical conditions to address to the bathroom, before the occurrence of urinary loss<sup>3</sup>.

However, the practice of physical activity is also a risk factor for the development of UI in women, especially during efforts, due to increased ground reaction force and, hence, abdominal pressure, influencing the floor pelvic muscles<sup>29,30</sup>.

Despite these differences, regarding the elderly, Bø<sup>30</sup> justifies the recreational nature of most gymnastics for elderly (85.7%). Therefore, the physical activity seems to be a protective factor for the development of the disease.

Against the level of dependency of the elderly and in line with the results reported by the multicenter study KNOW (Health, Wellness and Aging)<sup>4</sup>, conducted with 2,143 elderly in São Paulo, functional capacity was also identified as a factor associated with UI. The higher the dependence of the elderly, the greater the prevalence of incontinence, which may deteriorate with aging.

Regarding addressed comorbidities, the diagnosis of bronchitis/asthma indicated, in the adjusted model, 38% more likely prevalence to have UI compared to noncarriers of the disease. According to the literature, respiratory problems may be related to the risk of UI as a result of events such as chronic cough or sneezing, which increase intra-abdominal pressure and may cause damage to the pelvic floor<sup>31</sup>.

In a population-based study conducted with 5,506 residents of Boston (United States), between 30 and 79 years, it was found that men and women with asthma have twice the chance of having urinary loss<sup>32</sup>. However, in the study of Minassian Stewart and Wood<sup>33</sup>, with 2,875 women aged more than 20 years, asthma was not associated with UI in the adjusted analysis.

Another associated disease was stroke, CVA, or cerebral ischemia, which is in line with the results presented and it was stated in the KNOW study<sup>4</sup>. This association may be explained by brain damage caused by the disease, and although studies<sup>34,35</sup> relate the urinary symptoms to the affected area (frontal or temporal lobe), it is emphasized that the affected extension is more important than the venue itself, and the occipital lobe would be the only one not associated to UI<sup>36</sup>.

It is estimated that most seniors use at least one medication, and about a third of them use five or more simultaneously<sup>37</sup>. Many of these may cause increase in urination frequency. In the present study, polypharmacy increased by 27% the prevalence of the outcome. Some of the medications that may lead to the development of UI are sedatives and long-term hypnotics (functional incontinence), opiates (relaxation of the bladder), antidepressants, anesthetics, sympathomimetics and parasympatholytics, loop diuretics (increased urination frequency), alpha-adrenergic blocking agents (a decreased sphincter tone contributes to stress UI), calcium channel blockers (relaxation of the bladder leads to retention), and angiotensin-converting enzyme inhibitors (cough precipitates stress UI), among others<sup>9,37-39</sup>.

The health professional plays a key role in the early recognition of these factors associated with UI. A well-established relationship with the elderly can facilitate the process and, therefore, promote the identification of the type of incontinence and immediate treatment. Similarly, family members and caregivers should be alert to signs of urinary loss, optimize elderly mobility to the bathroom, and help in this process that affects their quality of life<sup>40</sup>.

The main limitations of this study were self-reported UI identification method and no clinical diagnosis; UI approach only through a question; and the type of study, cross section, which prevents the order of causality between the variables and may have reduced the prevalence of UI. In contrast, the percentage of response and the fact that the sample is derived from a population-based study in Florianópolis increase the relevance of the work.

Such findings have important implications for public policies aimed at preventing and reducing UI in the elderly population, seeking prior treatment and mitigating the consequences. In addition, it is necessary to use strategies for self-care, promote regular physical activity, be aware of the pharmacological effects of prescription medications, and promote activities that enhance the functional capacity of the elderly.

## CONCLUSION

The results demonstrated that the sociodemographic characteristics and those related to lifestyle and health conditions were significantly associated with UI in the elderly at Florianópolis. It also showed that female participants, with lower schooling, insufficiently active, with certain chronic diseases, using polypharmacy, and having some degree of functional dependence had a higher prevalence of UI.

Knowledge of the associated factors is fundamental to a better understanding of this comorbidity, mainly because UI is underreported, there is a lack of knowledge about the existence of treatment, and it is seen as part of the natural aging process.

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Received on: 04/22/2014

Final version presented on: 10/14/2014

Accepted on: 11/07/2014