

# Prevalence of urinary incontinence among institutionalized elderly and its relationship to mental state, functional independence, and associated comorbidities

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## ABSTRACT

Urinary incontinence is defined as the involuntary loss of urine through the urethra, which may cause many social and hygienic problems and changes that compromise social life such as depression, shame, and isolation, with higher prevalence in women than in men. **Objectives:** To determine the prevalence of urinary incontinence in a sample of institutionalized elderly and analyze its relationship with sociodemographic characteristics, comorbidities, cognitive function, and functional independence. **Methods:** Cross-sectional, descriptive, and exploratory study. It included 27 seniors of both genders, living in a long-term care facility who met the inclusion criteria. Prevalence was determined by the percentage of elderly patients with urinary incontinence; sociodemographic characteristics and comorbidities were evaluated through a standard history record, reviewed with data from medical records; cognitive function was assessed using the Mini-Mental State Examination, and functional independence was assessed using the modified Barthel scale, while the comparison between groups was made through the Student *t* test and the associations, through the chi-square test. **Results:** Nine subjects (33.33%) had urinary incontinence. There was an association between gender and urinary incontinence, with higher prevalence for females ( $p = 0.029$ ). Urinary incontinence was associated with low educational level ( $p = 0.014$ ), time at the institution ( $p = 0.004$ ), functional classification ( $p = 0.003$ ), and cognitive impairment ( $p = 0.001$ ). **Conclusion:** Urinary incontinence is common in elderly residents in long term care facilities, with a higher prevalence in women and was associated with low education, longer time at the institution, greater dependence in performing activities, and greater cognitive impairment.

**Keywords:** Aged, Institutionalization, Cognition, Urinary Incontinence, Activities of Daily Living

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## INTRODUCTION

According to the International Continence Society (ICS), urinary incontinence (UI) is defined by the involuntary leakage of urine, capable of creating social and hygienic discomfort, which is almost always erroneously interpreted as a natural aspect of aging. It can be classified as follows: urge incontinence, which is preceded by a sudden and difficult to control urge to urinate; stress incontinence, which can be caused by a sneeze, cough, laughter, activities, or physical exercises; and mixed UI, which is the association of both incontinences.<sup>1</sup>

Among the elderly, the mixed type of incontinence is more prevalent, being, for the most part, associated with nycturia, which is defined as waking up during the night more than once or twice to urinate, interfering with the quality of the sleep, and increasing the risk of falls and bone fractures.<sup>2</sup> Incontinence can be transitory or permanent.<sup>3</sup>

Individuals who suffer from this disorder, especially the elderly, depending on how it is manifested, may present with impairments in socializing such as loss of self-esteem, embarrassment, social isolation, depression, and shame, bringing significant social and physical repercussions to their lives.<sup>4</sup>

In Brazil, the prevalence at younger ages is higher in women than in men due to anatomical causes.<sup>5</sup> Approximately 50% of the institutionalized elderly experience urine leakage due to pharmacological treatment, nutrition, comorbidities, reduction of mobility, and overworked caregivers, among other things.<sup>6</sup>

The main reasons for a family to decide to institutionalize an elderly member are behavioral disorders, precarious health conditions, need for rehabilitation, lack of physical space to house them, lack of financial resources, the abandonment of the family that is not able to keep the elderly under its care.<sup>7</sup> The institutionalization strongly influences the continence of new residents, increasing the prevalence of urinary incontinence after a few years of residence.<sup>6,8</sup>

Due to aging, there are alterations such as atrophy of muscles and tissues, functional decrease of the nervous and circulatory systems, and a reduction in vesical volume that can all contribute to the onset of urinary incontinence. These are factors that together contribute to the reduction in elasticity and contractility of the bladder and can cause irritation in this organ.<sup>5</sup>

With aging and functional dependence, there is a significant increase in the prevalence of urinary incontinence.<sup>9</sup> It is known that aging

induces functional and structural changes in the urinary system predisposing it to incontinence.<sup>7</sup> However, at any age, urinary incontinence does not depend only on the integrity of the lower urinary tract, but also on the mobility, manual dexterity, lucidity, on alterations of motivation, and on associated diseases (cardiac insufficiency and *diabetes mellitus*, among others). Having all these factors associated, the elderly are more vulnerable to incontinence.<sup>3</sup>

## OBJECTIVE

This study aimed to determine the prevalence of urinary incontinence in a sample of institutionalized elderly in the city of Araranguá, in the state of Santa Catarina, and to analyze its relation to their sociodemographic characteristics, associated comorbidities, cognition, and functional independence in activities of daily living.

The hypothesis raised by the investigator was that urinary incontinence is frequent in institutionalized elderly and that it is related to cognitive impairment and their degree of mobility. The authors of the present study presupposed that the association of impaired cognition and reduced mobility, in addition to other situations, contributed to the development of urinary incontinence.

## METHOD

The present study was cross-sectional, descriptive, and exploratory. The data collection was carried out in a long-stay care institution for the elderly in the city of Araranguá, SC, where 34 elderly subjects were residents.

The inclusion criteria were that the participants should be 60 years old or older, of either gender, and be residing in the long-stay care institution. The exclusion criteria were applied to those elderly who had left the institution, to those who had some type of dementia that impeded an appropriate level of interaction and communication, and to those who were hospitalized or died during the research.

All the participants were instructed on the procedures to which they would submit and signed a formal consent form to participate in the study, which was approved by the Committee on Ethics in Research by the Centro de Hematologia e Hemoterapia de Santa Catarina (HEMOSC), CAAE: 39822814.0.0000.0110.

The prevalence was determined by the percentage of elderly who presented with UI; the sociodemographic characteristics and comorbidities were evaluated through a standard anamnesis form, reviewed through the medical records data; their cognitive function was evaluated by the Mini-Mental State Exam (MMSE), and their functional independence by the modified Barthel scale.

A standard anamnesis form was created with the information obtained by questioning the elderly directly and checked through the data in the institution's medical records that contained personal information such as age, weight, height, marital status, profession, city of birth, date of admission, clinical diagnosis, and family participation.

The MMSE evaluates the following cognitive functions: orientation as to time and place; fixation memory; attention; calculation; recall; language; comprehension of verbal and written instructions; and visual constructive capacity - through the copying of a drawing of two interposed pentagons.<sup>10,11</sup> The information for this instrument was obtained through direct interview with the elderly.

The modified Barthel scale contains the same evaluative activities as the original version, where it has a response scale of five points for each item, improving the sensitivity in detecting changes.<sup>12,13</sup> The modified Barthel index is an instrument that evaluates the individual's level of independence, being composed of ten items of basic activities of daily living. The activities are: feeding, grooming, bathing, anal sphincter control, bladder sphincter control, dressing, transfer from bed to chair, stairs, walking, and handling wheelchair (alternative to walking).<sup>14</sup>

The Barthel score ranges from 0 to 100 (with intervals of 5 points). The minimum score of 0 (zero) corresponds to maximum dependence for all the evaluated activities of daily living (ADLs) and the maximum score of 100 (one hundred) corresponds to total independence for the same evaluated ADLs. The scoring of this scale provides an absolute number that quantifies and classifies the subject's level of functional dependence.<sup>15</sup> Each item is evaluated individually by the following score: 1 - total dependence; 2 - severe dependence; 3 - moderate dependence; 4 - slight dependence; 5 - total independence.<sup>13</sup> Through the Barthel index it is possible to correctly quantify the individual's level of functional dependence.

In the evaluation of the function "bladder sphincter control," continent is the person who does not present episodes of involuntary leakage of urine.<sup>16</sup> In the present study, incontinent was the person who presented with involuntary leakage of urine. The information for this instrument was obtained by directly questioning the elderly and checking it against the information given by the nurse responsible.

Two groups of study were characterized: Group 1 (G1), composed of continent elderly and Group 2 (G2), composed of incontinent elderly, that is, with urinary incontinence.

The data were analyzed in the SPSS (version 21) statistical program. The statistical analysis involved descriptive (average, standard deviation, and percentage analysis) and inferential procedures. The comparison between groups was made through the Student *t* test (*F*) of independent samples, and the Levene test was used to test the equality of variances hypothesis. The variables included the parametric criteria of normality, and homogeneity of variances was analyzed through the Shapiro-Wilk normality test. The chi-square test ( $X^2$ ) of independence was used to verify the existence of a statistically significant association between two categorical variables. For all the analyses, the level of significance considered was 5%, under a confidence interval of 95%.

## RESULTS

The present study approached a total of 34 elderly who resided in a long-stay care institution. Of those, seven elderly were excluded: two who left the institution, one who died, one was younger than 60 years, and three had some type of dementia, which impeded appropriate interaction.

The sample was composed of 27 elderly of both genders (14 men and 13 women) with an average age of  $74.7 \pm 7.98$  years. As for the prevalence of urinary incontinence, nine elderly (33.33%) presented with it (Figure 1).

The sociodemographic characteristics of the groups are described in Table 1.

The cross-sectional analyses showed a similarity between the groups regarding the sample size ( $X^2 = 3.00$ ;  $p = 0.083$ ), age ( $F = 2.143$ ;  $p = 0.315$ ), weight ( $F = 0.496$ ;  $p = 0.460$ ), and height ( $F = 0.113$ ;  $p = 0.280$ ). The difference between groups in relation to time at

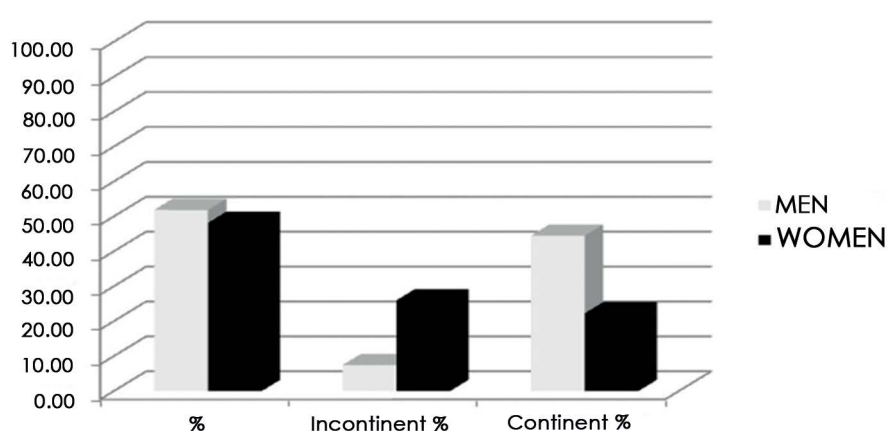


Figure 1. Prevalence of urinary incontinence according to gender

the long-stay care institution ( $F = 10.35$ ;  $p = 0.004$ ). An association was found between the occurrence of urinary incontinence with the distribution of gender ( $X^2 = 4.747$ ;  $p = 0.029$ ) and schooling ( $X^2 = 6.075$ ;  $p = 0.014$ ), but no association was found for marital status ( $X^2 = 1.40$ ;  $p = 0.706$ ) and family participation ( $X^2 = 0.154$ ;  $p = 0.926$ ).

The variables related to the comorbidities observed in the elderly did not present any association with the occurrence of urinary incontinence, such as diabetes ( $X^2 = 0.964$ ;  $p = 0.326$ ), hypertension ( $X^2 = 0.00$ ;  $p = 1.000$ ), dyslipidemia ( $X^2 = 1.854$ ;  $p = 0.173$ ), and stroke ( $X^2 = 1.421$ ;  $p = 0.233$ ) (Table 2).

The cross-sectional analyses showed a difference between the groups in cognitive function ( $F = 2.468$ ;  $p = 0.001$ ) and functional independence ( $F = 9.45$ ;  $p = 0.000$ ). There was a positive association between the occurrence of urinary incontinence and the classification in relation to functional independence ( $X^2 = 16.2$ ;  $p = 0.003$ ) (Table 3).

## DISCUSSION

In a study by Piccoli et al.<sup>17</sup> in the long-stay care institution Sociedade Beneficente Jacinto Godoy de Erechim, in the state of Rio Grande do Sul, it was confirmed that 85% of the participants suffered from UI. Bussato & Mendes<sup>18</sup> verified that the prevalence of UI was 57.3%. In the present study, the prevalence of UI was 33.33% for the institutionalized elderly evaluated. At least half of the institutionalized elderly are afflicted by UI, which contributes to physical and psychosocial problems.<sup>19</sup>

Females present a higher occurrence of UI than males and are affected in all the age brackets.<sup>18</sup> The present study demonstrated that the incontinent group had a greater percentage of UI for females (77.77%) than for males (22.22%). In a study made with 150 institutionalized elderly, the UI was more prevalent for females (62.6%) than for males (45.7%).<sup>18</sup>

The greater risk of UI related to the female gender is due to anatomical differences such as the female urethral length being longer than the male, the anatomy of the pelvic floor, reduced pressure of the urethral closure associated with bladder neck hypermobility, the weakening of pelvic floor muscles due to how pregnancy and giving birth effects the continence mechanism, and to hormonal changes due to menopause.<sup>20,21</sup> The elderly population as a whole is 55% composed of females, which is explained by feminization being attributed to biological factors and to the difference in exposure to mortality risk factors.<sup>15,20</sup>

The data obtained in the present study showed that a low schooling level is associated with UI. In a multicentric inquiry carried out in the city of São Paulo, a low level of schooling was also obtained in elderly with UI.<sup>22</sup> Another cross-sectional, observational study done with subjects at home found a greater prevalence of UI in the elderly with a low level of schooling. These results corroborate the present study.<sup>21</sup>

According to Bolina et al.<sup>23</sup> schooling may be an essential resource to determine a successful old age. Effective health strategies or actions can be provided by the health team through available and/or playful technologies to facilitate the understanding of the elderly in order to orient and prepare them, influencing their facing of UI.

**Table 1.** Sociodemographic characteristics of the sample

VARIABLES	G1	G2	P
Sample size (n = 27)	18	9	0.083
Age (years)	74.16 ± 8.52	75.77 ± 7.13	0.315
Weight (kilos)	71.41 ± 13.87	72.25 ± 5.75	0.460
Height (centimeters)	1.60 ± 0.11	1.55 ± 0.1	0.280
Gender:			0.029
Male	12 (66.66%)	2 (22.22%)	
Female	6 (33.33%)	7 (77.77%)	
Schooling:			0.014
Educated	13 (72.22%)	2 (22.22%)	
Not educated	5 (27.78%)	7 (77.78%)	
Marital status:			0.706
Single	5 (27.78%)	4 (44.44%)	
Married	1 (5.56%)	0 (0%)	
Separated	4 (22.22%)	1 (11.11%)	
Widowed	8 (44.45%)	4 (44.44%)	
Family participation:			0.926
Present	11 (61.1%)	6 (66.7%)	
Infrequent/Irregular	3 (16.7%)	1 (11.1%)	
Absent	4 (22.2%)	2 (22.2%)	
Time at the institution (months)	63.50 ± 66.55	131.58 ± 188.78	0.004

G1 - continent subjects; G2 - incontinent subjects

**Table 2.** Association between urinary incontinence and associated comorbidities

VARIABLES	G1	G2	P
Diabetes			0.326
Yes	3 (16.66%)	3 (33.33%)	
No	15 (83.33%)	6 (66.66%)	
Hypertension			1.000
Yes	10 (55.55%)	5 (18.52%)	
No	8 (44.44%)	4 (44.44%)	
Dyslipidemia			0.173
Yes	7 (38.88%)	6 (66.66%)	
No	11 (61.11%)	3 (33.33%)	
Stroke			0.233
Yes	4 (22.22%)	4 (44.44%)	
No	14 (77.77%)	5 (55.55%)	

G1 - continent subjects; G2 - incontinent subjects

**Table 3.** Mental state and functional independence of the elderly included in this sample

VARIABLES	G1	G2	P
MMSE (points)	17.44 ± 7.18	8.66 ± 3.84	0.001
Barthel index (points)	83.05 ± 20.02	33 ± 19.03	0.000
Classification:			0.003
Total dependence	0 (0%)	3 (33.33%)	
Severe dependence	1 (5.56%)	4 (44.44%)	
Moderate dependence	4 (22.22%)	0 (0%)	
Slight dependence	8 (44.44%)	2 (22.22%)	
Totally independent	5 (27.78%)	0 (0%)	

G1 - Continent subjects; G2 - incontinent subjects; MMSE: Mini-mental State Exam

There was no association between UI and family participation and marital status. The predominance of widowhood among the elderly with UI demonstrates the need to seek family support in the care for the elderly through a family caregiver. It is essential to stimulate a social support network, such as group meetings and leisure or even occupational activities to sustain and encourage the elderly with this problem.<sup>24</sup>

In this age bracket, associated comorbidities such as *diabetes mellitus*, systemic hypertension, dyslipidemia, and stroke are frequent. However, there was no association between UI with the associated comorbidities in the group evaluated. The prevalence of diseases or chronic conditions among the Brazilian elderly is high: 69% report having at least one disease or chronic condition.<sup>21</sup>

The incontinent group presented a greater cognitive deficit and greater dependence to perform the basic activities of daily living. Cognition directly and indirectly influences the depressive symptoms that are prevalent in institutionalized people. The institutionalized elderly have a reduced level of physical activity due either to advanced age or to functional disability. This entire clinical presentation may lead to dementias.<sup>24</sup> Urinary incontinence carries a significant percentage of association with dementia, making it one of the most frequent causes of commitment and raising the rates of committed elderly.<sup>25</sup> The longer the time at the institution, the greater the debility of the elderly,<sup>26,27</sup> as shown in this sample in which the incontinent group had been committed for a longer time than the continent group and presented greater debility.

The current sample showed an association between UI and functional classification. There are many studies that show a significant relationship between UI and functionality, manifesting as cognitive, emotional, and social alterations, as well as diminution of activities of daily living.<sup>28-30</sup> For disabled elderly, their incontinence may be due to their inability to reach the bathroom and not to real urological problems, especially in view of the small number of caregivers, overloaded with work, and without the time to take the elderly to the bathroom.<sup>20</sup>

To maintain continence, various elements are needed. The continent individual must identify the need to urinate, look for the appropriate place to do it, while being able to retain the urine for a period of time sufficient to reach that place safely, and then, upon arrival, be capable of urinating. Many institutions have beds, chairs, or toilet bowls that are difficult to reach, which exacerbates the problem.<sup>20</sup>

The present study had some limitations such as the outlining of the cross-sectional study and a small sample composition (elderly in a long-stay care institution in the city of Araranguá, Santa Catarina), being poorly representative, which limited its external validity. This work is the first step towards knowing the health condition of this elderly group in that city, which makes it possible to develop and implement actions that benefit and promote health in this population, reducing the occurrence of UI. Future studies should be made with a larger number of subjects to offer different forms of analyzing the data.

## CONCLUSION

Urinary incontinence is frequent among the elderly residing in long-stay care institutions, with more prevalence among females and which correlates with low education, longer time at the institution, more dependence to perform daily activities, and greater cognitive deficit.

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