URINARY INCONTINENCE AMONG OLDER ADULTS LIVING IN THE RURAL AREA OF A MUNICIPALITY IN SOUTHERN BRAZIL

Incontinência urinária entre idosos residentes em área rural de município do sul do brasil

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ABSTRACT

OBJECTIVE: To measure the prevalence of and identify factors associated with the occurrence of urinary incontinence (UI) in older adults (aged 60 years or older) living in the rural area of the municipality of Rio Grande, southern Brazil. **METHOD:** In a single-visit approach, interviewers systematically visited 80% of the households in the rural area of this municipality between April and October 2017. A standardized questionnaire was administered to older adults for information on demographic characteristics, socioeconomic characteristics, lifestyle habits, and morbidity pattern. Prevalence ratio (PR) was used as the effect measure. The c^2 test was used to compare proportions. Poisson regression models with robust variance were used in the multivariate analysis. **RESULTS:** Of 1028 respondents (90.9% of the total), 15.9% (95%CI 13.6–18.1) reported having UI. Adjusted analysis showed that the risk of UI increases with age and is 3 times higher in women (PR = 3.72; 95%CI 2.66–5.21). Perception of health status as fair, poor, or very poor had a PR = 1.68 (95%CI 1.25–2.26) and having 2 or more comorbidities had a PR = 1.73 (95%CI 1.17–2.55). **CONCLUSION:** In this study, the prevalence of UI was 15.9%, being significantly more prevalent in women, in older adults aged 65 years or older, in those with 2 or more morbidities, and in those perceiving their health status as fair, poor, or very poor.

KEYWORDS: aged; rural areas; urinary incontinence.

RESUMO

OBJETIVO: Este estudo mediu a prevalência e identificou fatores associados à ocorrência de incontinência urinária (IU) entre idosos (60 anos ou mais) residentes na área rural de Rio Grande, Rio Grande do Sul. **MÉTODO**: Em abordagem única, entrevistadores visitaram de forma sistemática 80% dos domicílios da área rural desse município entre abril e outubro de 2017. Questionário padronizado foi aplicado aos idosos buscando informações sobre características demográficas, socioeconômicas, hábitos de vida e padrão de morbidade. Utilizou-se como medida de efeito a razão de prevalências (RP), o teste do c^2 para comparar proporções e a regressão do Poisson com ajuste da variância robusta na análise multivariável. **RESULTADOS**: Entre os 1.028 entrevistados (90,9% do total), 15,9% (IC95% 13,6–18,1) referiu IU. A análise ajustada mostrou que o risco de IU aumenta com a idade e é 3 vezes maior nas pessoas do sexo feminino, com RP = 3,72 (IC95% 2,66–5,21). Perceber seu estado de saúde como regular, ruim ou muito ruim mostrou RP = 1,68 (IC95% 1,25–2,26) e ter duas ou mais comorbidades tem RP = 1,73 (IC95% 1,17–2,55). **CONCLUSÃO**: Neste estudo, a prevalência de IU foi de 15,9%, sendo significativamente mais prevalente em mulheres, idosos acima de 65 anos, naqueles com duas ou mais morbidades e nos que percebem sua saúde como regular, ruim ou muito ruim.

PALAVRAS-CHAVE: idoso; zona rural; incontinência urinária.

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INTRODUCTION

Urinary incontinence (UI) is characterized by involuntary loss of urine.[1] It may be acute or chronic[2] and is classified into stress, urgency, or mixed UI. Stress UI results from urethral sphincter weakness and may be elicited by coughing, sneezing, laughing, or on physical exertion, while urgency UI is associated with an urge to void. Mixed UI results from the combination of these 2 types.[3]

UI is highly prevalent worldwide, with prevalence rates ranging from 9 to 55%.[4] Women are more commonly affected than men up to the age of 80 years, and both sexes are affected equally thereafter.[2] Among older adults, UI is directly related to decreased bladder elasticity, reduced strength of the bladder detrusor muscle, detrusor overactivity, estrogen deficiency, external urinary sphincter atrophy, and prostatic hyperplasia. This picture is further aggravated by impairment of neurological and cognitive function, reduction in more robust physical activity, postural instability, and medication use.[4,5]

UI poses physical problems, such as increased hospital admissions for fractures resulting from fast movements, skin infections, and urinary tract infections, as well as psychological problems, such as anger, embarrassment, and depression.[4,5] These problems can lead to financial difficulties, increased likelihood of institutionalization because of difficulty finding caregivers, and social isolation characterized by withdrawal from leisure activities, work, and interaction with friends and family.[4,5] The impact of UI on quality of life is so striking that half of seriously ill hospitalized patients consider it worse than death.[6]

Although UI is a highly prevalent life-limiting illness, few population-based studies have evaluated this outcome in older adults living in rural areas, where the population tends to be poorer and access to health services is limited. Therefore, the purpose of this study was to measure the prevalence of and identify factors associated with the occurrence of UI in older adults (aged 60 years or older) living in the rural area of the municipality of Rio Grande, southern Brazil.

METHOD

The present study is part of a consortium of the Graduate Program in Public Health of the Universidade Federal do Rio Grande (FURG), which involves master's and doctoral students and aims to evaluate the health of older adults living in the rural area of the municipality of Rio Grande.

This municipality has a population of approximately 210,000 inhabitants and is located in Rio Grande do Sul, the southernmost state of Brazil, within a distance of 330 km from Porto Alegre, the state capital. According to data from the Brazilian Institute of Geography and Statistics,[7] the estimated population for the rural area in 2010 was 8,400 inhabitants. Of these, approximately 1,100 were 60 years of age or older. Trade, agribusiness (basically livestock farming and rice production), port activities (grain exports), fishing, and pesticide industry are the basis of the economy of the municipality.

Eligible participants were all older adults aged 60 years or older who were living the in the rural area of the municipality between April and October 2017. Those who were hospitalized or institutionalized at the time of the interview were excluded. This was a cross-sectional study in which participants were interviewed only once at home.

Based on data from the Brazilian Institute of Geography and Statistics on the geographic boundaries of the census tracts in the rural area, each cluster of households was mapped and assigned a "sector number". Upon arrival in each sector, a household was randomly selected by the field supervisor as a starting point for the survey. Once four subsequent households were visited by the interviewers, the fifth household was skipped, then the next 4 households were visited by the interviewers, and so forth until the entire sector was covered. All household members aged 60 years or older were interviewed. This can be considered a systematic sample covering 80% of the households in the rural area of the municipality of Rio Grande. Of note, vacant households were not taken into account and two additional attempts to visit the household were made if the household members were not at home on the first attempt. Participants were considered lost to follow-up if they were not found at home after at least three visits by interviewers to the household.

Sample size was calculated *a posteriori* using EPI Info 6.4,[8] considering a prevalence of UI of 15.9%, a margin of error of 3.0 percentage points, 95% confidence level, and an increase of 9.1% to compensate for possible losses. Based on these parameters, a sample size of at least 622 older adults was required. To evaluate associated factors with a 95% confidence level and power of 80%, a sample size of at least 993 older adults was necessary. This amount already includes an increase of 15% to control for possible confounding factors and 10% for possible losses.

Two previously tested, standardized questionnaires were used for data collection. One contained questions about the characteristics of older adults, and the other about the characteristics of the household. The older adult questionnaire was answered either by the older adult or, if not possible, by the caregiver. The household questionnaire was answered by the head of the household, who was not always the older adult living there.

A team of interviewers participated in a training program, for a total of 32 hours, followed by a pilot study conducted in a census tract in the rural area of Rio Grande. The households visited during the pilot study were excluded from the sampling process. At the end of the pilot stage, six interviewers were selected for the present study. Data were collected using a tablet computer containing the electronic version of the questionnaires based on the Research Electronic Data Capture (REDCap) system.[9]

At the end of each working day, the questionnaires were transferred from the tablet computers to FURG server (redcap.furg.br). The data were reviewed weekly and any inconsistencies or incomplete responses were then corrected. If necessary, the respondents were contacted again for clarification. At the end of the fieldwork, the data were transferred to Stata14® for statistical analysis.[10]

Quality control of the collected data was performed by two supervisors of the consortium by telephone calls. At the end of the data collection process, 105 interviews (10.5% of the total) had to be partially repeated. The kappa agreement between the variables of interest ranged from 0.69 (for the question "Do you ever leak urine unintentionally?") to 0.88 (for the question "How old are you?").

A 3-level hierarchical model was constructed for analysis. The first level (distal) included demographic variables (age, sex, living with a partner) and socioeconomic variables (education and family income). The second level (intermediate) included the variable describing the number of household members. The third level (proximal) included variables related to lifestyle habits (smoking and physical activity), health (self-perceived health status and body mass index [BMI]), and presence of self-reported morbidities (diabetes mellitus, stroke, hypertension, cancer, and kidney disease). Physical activity was measured by asking five questions about walking or cycling to work, as a leisure activity, or as a means of transportation and three questions about handling or lifting heavy objects while working. Self-perceived health status was assessed by asking the following question: "In comparison with other people of the same age, how do you consider your health status?". BMI was calculated from self-reported weight and height. The presence of morbidities was assessed by asking whether any physician had already informed that the participant had the morbidity in question. The main outcome was involuntary loss of urine (UI) as reported by the older adults. Participants were considered to have UI if they answered "yes" to any of the following questions: "Do you ever leak urine unintentionally?"; "Does any urine leak unintentionally when you cough, laugh, sneeze, or make any effort?"; and "Do you have such a strong desire to pass urine that you leak before reaching the toilet?"; and also if they answered "1 month or more" to the question "For how long have you been leaking urine unintentionally?".

Descriptive analysis included the prevalence rates of both the main outcome and independent variables. The effect measure of choice was prevalence ratio (PR), obtained by Poisson regression models with robust variance.[11] For variables with more than two categories, heterogeneity tests were used for dichotomous and polytomous items, and the linear trend test for ordinal items.[12]

Adjusted analysis obeyed the hierarchy of the previously defined model and aimed to control the effect of confounding factors and mediators between independent variables and the main outcome.[12] By adjusting the variables, they were controlled for those at the same level and at previous levels. Only variables with a p-value less than 0.20 in the association with the main outcome remained in the adjusted model. The level of significance was set at 95% for two-tailed tests.[12]

The study was approved by FURG Research Ethics Committee (protocol number 51/2017, approval number 23116.009484/2016-26). All older adults participating in the study signed an informed consent form in duplicate, one copy was retained by the participant, while the other copy was filed at the consortium headquarters.

RESULTS

During the visits to the rural area, 1131 older adults were identified as eligible for the study. Of them, 1,028 were interviewed, with a 90.9% response rate. Reasons for non-participation were inability to find the older adult at home and refusal to be interviewed, even after three attempts to visit the household.

Table 1 shows that approximately half (44.6%) of the study population was between 65 and 74 years of age, 55.2% were men, and 92.7% self-reported as white. Approximately one-third of the study population (30.6%) had completed 5 years or more of schooling and 87% received up to 2.9 minimum wages. About 60% perceived their health status as good or very good and almost two-thirds (64.6%) reported having been diagnosed with stroke, diabetes mellitus, hypertension, cancer, or kidney disease. The prevalence of UI in this population was 15.9%, with a 95% confidence interval (95%CI) 13.6–18.1.

In the adjusted analyses, the following variables were associated with the main outcome: age ≥ 75 years (PR = 1.82; 95%CI 1.17–2.81); female sex (PR = 3.74; 95%CI 2.68–5.23); perception of health status as fair, poor, or very poor

Table 1 Characteristics of the population aged 60 years or older living in the rural area of the municipality of Rio Grande, RS, Brazil, in 2017 (n = 1,028).

Characteristics	Percentage % (n)
Age (years)	
60 to 64	26.0 (267)
65 to 74	44.6 (459)
75 or more	29.4 (302)
Mean ± standard deviation	70.9 ± 8.1
Sex	
Male	55.2 (567)
Female	44.8 (461)
Race	
White	92.7 (953)
Mixed	3.5 (36)
Black	3.8 (39)
Living with a partner	64.1 (659)
Monthly family income (minimum wages)	
Up to 1.9	40.7 (418)
2 to 2.9	46.6 (479)
3 or more	12.7 (131)
Mean ± standard deviation	2.3 ± 2.6
Median	2.0
Education (completed years of schooling)	
0 to 2-	41.6 (428)
3 to 4	27.8 (286)
5 or more	30.6 (314)
Mean ± standard deviation	3.6 ± 3.8
Number of household members	
1	22.0 (226)
2	49.7 (511)
3 or more	28.3 (291)
Mean ± standard deviation	2.2 ± 1.1
Employed	15.1 (155)
Current or former smoker	47.0 (483)
Consumed alcohol in the past week	16.7 (172)
Daily physical activity (minutes)	
None	33.1 (340)
30 to 60	48.1 (495)
90 or more	18.8 (193)
Self-perceived health status	
Good or very good	57.7 (593)
Fair, poor, or very poor	42.3 (435)
Body mass index[a]	
Underweight (< 18.5)	1.7 (17)
Normal weight (18.5 to 24.9)	34.7 (357)
Overweight (25.0 to 29.9)	42.1 (433)
Obese (> 29.9)	21.5 (221)
Mean ± standard deviation	27.0 ± 4.7
Self-reported diagnosed conditions[b]	
None	35.4 (364)
One	41.3 (425)
Two or more	23.3 (239)
Urinary incontinence	15.9 (163)

[a]Self-reported weight/height; [b]stroke, diabetes mellitus, hypertension, cancer, or kidney disease.

(PR = 1.68; 95%CI 1.25–2.26); and having two or more morbidities (PR = 1.73; 95%CI 1.17–2.55) (Table 2).

DISCUSSION

The prevalence of UI among older adults living in the rural area of the municipality of Rio Grande was 15.9%. After adjustment, the following variables remained associated with the occurrence of UI: age 75 years or older, female sex, perception of health status as fair, poor, or very poor, and presence of two or more morbidities.

This prevalence shows that one in every six older adults had UI in the rural area of Rio Grande. Similar studies have reported rates ranging from 9.8 to 42%.[13,14] This difference may be attributed to some differences between the studies. While some studies included only women,[15-18] others investigated an older population.[17] There was also a lack of standardization of the diagnostic criteria to measure the outcome of interest. None of the studies used an objective method to measure the occurrence of UI; in addition, different questions were used to characterize the outcome. Only three studies were conducted in a rural population,[17-19] none of them is Brazilian.

These rates, however, may be underestimated. Because of the embarrassment associated with UI, many people do not admit having the problem. In addition, UI is often considered part of the aging process. As a result, individuals become accustomed to the dysfunction, changing their lifestyle habits without seeking medical care.[20]

The main variable associated with UI in the present study was sex. For every man with UI, there were almost four women with UI. This difference can be explained physiologically, based on hormonal differences and issues related to reproductive life.[21] Most studies on the topic, evaluating men and women, have indicated this difference. An exception was a study conducted in Japan, which showed a higher prevalence in men and attributed this difference to greater difficulty of women reporting the problem.[13] The difference between sexes may be attributable to some aspects of reproductive life, which could not be confirmed in the present study because of the small number of women in the sample. Despite this difference, the present study showed that one in every 13 men had UI. Although this rate is lower than that observed in women, attention should be paid to this population.

The probability of UI occurrence is almost twice as high in older adults aged 75 years or older as in those aged 60 to 64 years. This shows that age is a major determinant of this illness. A similar magnitude difference has been identified in previous studies.[13-15,21] This results from anatomical and

physiological changes that occur in the urinary tract, which are inherent in the aging process.[5,13] In addition, other situations faced by older people, such as difficulty walking, falls, cognitive decline, and effects of medications used to treat other diseases, may help explain the association between UI and increasing age.[5,14]

Self-perception of health status as fair, poor, or very poor was also associated with the probability of occurrence of UI. There is a lack of consensus in the literature about this finding, where two studies reported similar results,[13,21] while one study found no association. In the latter, the authors suggest that no association was found because UI was regarded by

Table 2 Crude analysis and analysis adjusted for factors associated with urinary incontinence in persons aged 60 years or older living in the rural area of the municipality of Rio Grande, RS, Brazil, 2017 (n = 1,028).

Level	Characteristic	Prevalence of urinary incontinence % (n = 163)	Analysis (95%CI)	
			Crude	Adjusted
I	Age		p = 0.006	p = 0.025[a]
	60 to 64 years	10.1 (27)	1.00	1.00
	65 to 74 years	16.3 (75)	1.61 (1.07–2.44)	1.60 (1.07–2.40)
	75 years or more	20.2 (61)	2.00 (1.31–3.05)	1.82 (1.17–2.81)
	Sex		p < 0.001	p < 0.001
	Male	7.4 (42)	1.00	1.00
	Female	26.2 (121)	3.78 (2.70–5.29)	3.72 (2.66–5.21)
	Living with a partner		p = 0.181	p = 0.988
	No	17.9 (66)	1.00	1.00
	Yes	14.7 (97)	0.82 (0.62–1.09)	0.99 (0.73–1.36)
	Monthly family income (minimum wages)		p = 0.262	p = 0.394[a]
	Up to 1.9	13.6 (57)	1.00	1.00
	2 to 2.9	17.1 (82)	1.25 (0.92–1.71)	1.11 (0.80–1.54)
	3 or more	18.3 (24)	1.34 (0.87–2.07)	1.33 (0.88–2.00)
	Education (completed years of schooling)		p = 0.035	p = 0.130[a]
	Up to 2	18.9 (81)	1.00	1.00
	3 to 4	15.7 (45)	0.83 (0.60–1.16)	0.83 (0.60–1.14)
	5 or more	11.8 (37)	0.62 (0.43–0.89)	0.70 (0.49–1.00)
II	Number of household members		p = 0.382	p = 0.498[a]
	1	12.8 (29)	1.00	1.00
	2	16.6 (85)	1.29 (0.88–1.92)	1.25 (0.85–1.83)
	3 or more	16.8 (49)	1.31 (0.86–2.01)	1.22 (0.80–1.85)
III	Smoking		p < 0.001	p = 0.489
	Never smoked	21.1 (115)	1.00	1.00
	Current or former smoker	9.9 (48)	0.47 (0.34–0.64)	0.89 (0.64–1.24)
	Physical activity (minutes)		p < 0.001	p = 0.238[a]
	None	23.2 (79)	1.00	1.00
	30 to 60	13.7 (68)	0.59 (0.44–0.79)	0.82 (0.61–1.09)
	90 or more	8.3 (16)	0.36 (0.21–0.59)	0.70 (0.42–1.17)
	Self-perceived health status		p < 0.001	p = 0.001[a]
	Good or very good	10.5 (62)	1.00	1.00
	Fair, poor, or very poor	23.2 (101)	2.22 (1.66–2.97)	1.68 (1.25–2.26)
	Body mass index		p = 0.003	p = 0.280[a]
	Underweight or normal weight	12.0 (45)	1.00	1.00
	Overweight	15.7 (68)	1.30 (0.92–1.85)	1.11 (0.79–1.55)
	Obese	22.6 (50)	1.88 (1.30–2.71)	1.35 (0.92–1.98)
III	Self-reported morbidities[b]		p < 0.001	p = 0.015[a]
	None	9.6 (35)	1.00	1.00
	One	15.3 (65)	1.59 (1.08–2.34)	1.27 (0.87–1.84)
	Two or more	26.4 (63)	2.74 (1.87–4.01)	1.73 (1.17–2.55)

95%CI: 95% confidence interval; [a]linear trend test; [b]stroke, diabetes mellitus, hypertension, cancer, or kidney disease.

many as a condition inherent in the aging process rather than a disease that contributes to poor health status.[22] This variable may be related to UI as the cause of poor health status perception or it may be related to UI by being present in those who have more comorbidities, with these being the cause of poor health status perception. The present study, however, is unable to make such a differentiation.

The present study found an association between UI and the presence of at least two other comorbidities, such as stroke, diabetes mellitus, hypertension, cancer, and kidney disease. Most studies have found individual associations with each of these conditions. Byles et al.[17] used an statistical model including several comorbidities that are common to older adults and found an association of these conditions with UI. All studies analyzing UI and stroke found significant associations.[13-15,18,21] Four studies found an association with diabetes mellitus,[14-16,18] while only one study found an association with hypertension.[15]

A limitation of this study is the outcome measure, as the gold standard for the diagnosis of UI is urodynamic study. The use of questionnaires may have resulted in underestimation of the prevalence because of the embarrassment associated with reporting UI or having difficulty understanding some questions. However, since this is a population-based study with a representative sample, the prevalence found is the minimum rate expected in older adults living in the rural area of the municipality of Rio Grande. This highlights the importance of the data produced here for both health professionals and managers, allowing them to plan expenditures and interventions targeting a condition that has so far been neglected in actions taken within primary care settings.

CONCLUSION

The prevalence of UI found in this study population was 15.9%. The variables that were significantly associated with UI were being female, age 65 years or older (with increased risk for those aged 75 years or older), having at least 2 other morbidities, and perceiving health status as fair, poor, or very poor.

The recommendation that can be drawn from this study is that, although demographic variables such as sex and age cannot be modified, action should take place on three levels:

- at the patient level, by explaining that UI is not an inherent condition of aging and, once UI is identified, medical attention should be sought to treat it rather than neglecting it, as often happens;
- at the health professional level, by showing that this condition must be taken into account when caring for older adults, aiming at early diagnosis, giving reasonable prescription of medications for other diseases that might affect urinary continence, and promoting proper management of UI whether by drug therapy or educational measures;
- at the manager level, by informing managers of the need for programs to reduce the stigma associated with UI, promoting the socialization of older adults in order to improve the self-esteem and well-being of health care users with regard to this illness.

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