

ORIGINAL ARTICLE

URINARY INCONTINENCE IN WOMEN: RISK FACTORS ACCORDING TO TYPE AND SEVERITY

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ABSTRACT


Objective: To verify factors associated with urinary incontinence in women by type and severity.
Methodology: A cross-sectional study conducted from November 2018 to April 2019 with 30 women in a teaching hospital of Pernambuco. The Gaudenz-Fragebogen instrument was used to identify incontinence types, and the Incontinence Severity Index to classify urinary loss severity. Fisher's exact test was used to analyze qualitative variables, and the t-Student test for rational variables.
Results: Stress-induced urinary incontinence was the most frequent type (66.7%), in its moderate form (43.3%), and was associated with low schooling ($p < 0.001$), Body Mass Index of 28.6 ($p = 0.043$), abdominal circumference of 103.4 ($p < 0.001$), diabetes ($p < 0.001$), number of deliveries above 4 ($p = 0.046$), gynecological surgery ($p = 0.023$), and lack of physical activity ($p = 0.001$).
Final Considerations: Identifying the type, severity, and main modifiable risk factors may support more effective and efficient preventive and curative interventions.


DESCRIPTORS: Stress-induced urinary incontinence; Urge urinary incontinence; Risk factors; Woman's health; Nursing care.


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INCONTINÊNCIA URINÁRIA EM MULHERES: FATORES DE RISCO SEGUNDO TIPO E GRAVIDADE

RESUMO

Objetivo: verificar fatores associados a incontinência urinária em mulheres por tipo e gravidade. *Metodologia:* estudo transversal, realizado de novembro de 2018 a abril de 2019, com 30 mulheres em um hospital escola de Pernambuco. Foi utilizado o instrumento Gaudenz-Fragebogen para identificar os tipos de incontinência e o Incontinence Severity Index para classificar a gravidade da perda urinária. Utilizou-se o teste Exato de Fisher para analisar variáveis qualitativas e t-Student para variáveis racionais.

Resultados: incontinência urinária de esforço foi o tipo mais frequente (66,7%), na forma moderada (43,3%) e esteve associada a baixa escolaridade ($p < 0,001$), índice de massa corporal de 28,6 ($p = 0,043$), circunferência abdominal de 103,4 ($p < 0,001$), diabetes ($p < 0,001$), número de partos superior a 4 ($p = 0,046$), cirurgia ginecológica ($p = 0,023$) e falta de atividade física ($p = 0,001$).

Considerações Finais: a identificação do tipo, da gravidade e dos principais fatores de risco modificáveis poderá subsidiar intervenções preventivas e curativas mais eficientes e efetivas.

DESCRITORES: Incontinência Urinária por Estresse; Incontinência Urinária de Urgência; Fatores de Risco; Saúde da Mulher; Cuidados de Enfermagem.

INCONTINENCIA URINARIA EN MUJERES: FACTORES DE RIESGO DE ACUERDO CON EL TIPO Y LA GRAVEDAD

RESUMEN:

Objetivo: verificar factores asociados con la incontinencia urinaria en mujeres, por tipo y por gravedad.

Metodología: estudio transversal realizado entre noviembre de 2018 y abril de 2019 con 30 mujeres en un hospital escuela de Pernambuco. Se utilizó el instrumento Gaudenz-Fragebogen para identificar los tipos de incontinencia y el Incontinence Severity Index para clasificar la gravedad de la pérdida de orina. Se utilizó la prueba exacta de Fisher para analizar las variables cualitativas, y el t-Student para las variables racionales.

Resultados: la incontinencia urinaria por esfuerzo fue el tipo más frecuente (66,7%), en su forma moderada (43,3%) y estuvo asociada a un bajo nivel de escolaridad ($p < 0,001$), a un Índice de Masa Corporal de 28,6 ($p = 0,043$), a una circunferencia abdominal de 103,4 ($p < 0,001$), diabetes ($p < 0,001$), cantidad de partos superior a 4 ($p = 0,046$), cirugía ginecológica ($p = 0,023$) y a la falta de actividad física ($p = 0,001$).

Consideraciones finales: identificar el tipo, la gravedad y los principales factores de riesgo modificables podrá ayudar a diseñar intervenciones preventivas y curativas más eficientes y efectivas.

DESCRIPTORES: Incontinencia Urinaria por Estrés; Incontinencia Urinaria de Urgencia; Factores de Riesgo; Salud de la Mujer; Cuidados de Enfermería.

INTRODUCTION

Urinary Incontinence (UI) is defined as a complaint on involuntary urine loss, and is a common health condition that affects approximately 10% to 40% of the world population and that may come to decrease the quality of life of the affected individuals⁽¹⁻³⁾.

This condition has a multi-factorial determination, which can be triggered by neuromuscular diseases, fragility of the support system, pregnancy, hormonal changes, cancer, diabetes, and heart failure, in addition to medications and surgeries, which are potentially capable of causing a decrease in pelvic muscle tone or generate nerve damage. However, the role of each of these conditions and the real cause of UI is still something that requires investigation⁽³⁾.

Despite affecting both genders, UI is more common in women and this can be explained at first sight, anatomically, by the short length of the urethra and by conditions associated with the pelvic floor musculature⁽⁴⁾. UI manifests itself in different age groups and, although it is not part of physiological aging, there is an increase in its occurrence with age^(4,5).

According to etiology and pathophysiology, UI can be classified into the following most common subtypes: Stress-induced Urinary Incontinence (SUI), defined as involuntary loss of urine by physical exertion, Urge Urinary Incontinence (UII), which corresponds to the one associated with a strong urge to urinate, and Mixed Urinary Incontinence (MUI), which combines characteristics of the first two^(1,6).

UI decreases women's quality of life, causing their life to be limited, as the daily use of absorbents, spending on medications, high voiding frequency, typical urine odor, and restrictions on certain physical activities, in addition to the elimination of urine during the sexual act, induce embarrassment and social isolation^(7,8).

Despite these limitations, UI remains a silent issue. The affected women tend to hide their symptoms and do not seek treatment. It is estimated that only 33.3% of them seek a physician, 35.4% receive guidance on the disease, 25% know the diagnosis, and only 12.5% undergo some type of treatment⁽⁷⁾. Moreover, health professionals also contribute to sub-diagnosis and sub-treatment⁽³⁾.

The initial assessment should take place using cost-effective and non-invasive instruments, which make it possible to identify the subtypes of the disease, recognize the population at risk, and understand their demographic and health characteristics⁽⁹⁾.

In view of the lack of studies on factors associated with the types and severity of UI in women, no updated information is available to mediate its onset and its evolution, which contributes to the silent progression of this condition. These arguments justify this research, which aims to verify factors associated with urinary incontinence in women, by type and severity.

METHOD

A descriptive, cross-sectional study with a quantitative approach, carried out from November 2018 to April 2019, in the urodynamic study sector of a university hospital in the city of Recife-PE.

The sample consisted of 30 women who corresponded to the population present for the urodynamic test during the period of data collection. The following inclusion criteria were adopted: age group from 18 years old onwards, without cognitive impairment. Those

unable to answer the questions asked, who would undergo tests other than the urodynamic study and who had performed previous conservative or surgical treatments for UI, due to possible bias regarding the severity submitted to the care wished to be evaluated.

Data collection was carried out by primary source, through an interview, using a questionnaire organized in four parts. The first refers to the person's data (age, skin color, schooling, income, self-referred weight and height, Body Mass Index, and waist circumference), and the second part is related to the clinical aspects (morbidity, use of diuretic, smoking, drinking, gynecological surgery, number of pregnancies, number of deliveries).

The Body Mass Index (BMI) was obtained by dividing the body weight in kilograms by the height in meters squared (kg/m^2). For classifying the values, the recommendation of the World Health Organization was adopted for evaluating adults and older adults: below normal ($\text{BMI} < 18.5$), normal ($18.5 > \text{BMI} \leq 24.0$), overweight ($\text{BMI} \geq 25$), and obesity ($\text{BMI} \geq 30$).

The measurement of the abdominal circumference was performed with the waist circumference (midpoint between the iliac crest and the last rib), with flexible and inelastic measuring tape, taking care not to compress the tissues at the end of expiration, and the reference value adopted was $< 88 \text{ cm}^{(10)}$.

The third part was the classification of the UI types, carried out through the Gaudenz-Fragebogen Instrument validated for Brazil⁽⁹⁾, consisting of 16 dichotomous items in the form of questions that allow for two final scores, the urge-score (U-S) for urge urinary incontinence (UUI) and the stress score (S-S) for stress-induced urinary incontinence (SUI). The final score between 13 and 26 points attests to the occurrence of one or another type of UI.

The fourth part consisted of the Incontinence Severity Index (ISI) instrument, validated for Brazil⁽¹¹⁾, for the purpose of assessing the severity of urinary incontinence. It is a brief instrument, composed of two questions regarding the frequency and amount of urinary loss, in which the total score is that of the first question multiplied by the score of the second question, classifying the severity of UI in: none (0), slight (1-2), moderate (3-4), severe (6-8), and very severe (12).

The collected data were entered and analyzed using the SPSS for Windows software, version 25.0, with descriptive statistics, using distribution of frequencies, means (\bar{x}) as a measure of central tendency, and standard deviation (SD) as a measure of dispersion, beyond the minimum (L_{\min}) and maximum (L_{\max}) limits of the distributions. To verify the existence of an association between the type of UI and associated factors, Fisher's exact test was used for qualitative variables and, for rational variables, the Student's t test for independent samples. Levene's test was considered to test the hypothesis of equality of variances. The significance level was considered through the p value < 0.05 .

The project was approved by the Ethics Committee of the Catholic University of Pernambuco, opinion number 3,234,052.

RESULTS

Table 1 shows the quantitative variables for characterizing the study population. As it is verified, the mean age of the patients was 56.2 years old (SD:14.4), and the mean weight, height, BMI and waist circumference were as follows: 70.8 kg (SD: 10.2), 161.3 cm (SD: 6.6), 27.3 (SD: 3.8), 102.9 cm (SD: 15.2). They had a mean number of 4.2 pregnancies (SD: 2.3) and a mean of 3.7 deliveries (SD: 2.1).

Table 1 - Quantitative variables for the characterization of the study participants. Recife, PE, Brazil, 2019

Variables	Mean	Standard Deviation	Minimum	Maximum
Age	56.2	14.4	25	80
Weight (kg)	70.8	10.2	52	95
Height (cm)	161.3	6.6	145	172
BMI	27.3	3.8	20	35
Abdominal circumference	102.9	15.2	80	131
Pregnancies	4.2	2.3	1	9
Deliveries	3.7	2.1	1	9

Regarding the qualitative variables that characterized the studied population, it was observed that the highest frequency was self-declared white skin color (n=18; 60%), schooling corresponding to elementary school (n=21; 70%), and earning a minimum wage (n=23; 76.7%).

In the classification of the type of UI, according to the Gaudenz-Fragebogen instrument (Table 2), it is observed that 20 (66.7%) had stress-induced urinary incontinence, while 10 (33.3%) had urge urinary incontinence. And 13 (43.3%) participants (\bar{x} =5.94; SD=3.3; L_{\min} =1; L_{\max} =12) had moderate severity of the urinary symptomatology.

Table 2 - Qualitative variables for the characterization of the study participants. Recife, PE, Brazil, 2019

Variables	N	%
Gaudenz-Fragebogen		
SUI	20	66.7
MUI	10	33.3
ISI		
Mild	3	10
Moderate	13	43.3
Severe	10	33.3
Very severe	4	13.3

Table 3 shows that there was a significant association between the type of UI of the participants and the following qualitative variables: schooling (p<0.001), diabetes mellitus (p<0.001), history of hysterectomy (p=0.050), and failure to perform physical activity (p<0.001).

Table 3 - Association between clinical variables and lifestyle, according to the type of urinary incontinence. Recife, PE, Brazil, 2019

Variables	Type of UI		p-value*
	SUI (%)	MUI (%)	
Schooling			
Elementary	14 (70)	07 (70)	<0.001
High School/Higher Education	06 (30)	03 (30)	
Income			
1 MW	17 (85)	06 (60)	0.181
> 1 SM	03 (15)	04 (40)	
Arterial hypertension			
Yes	17 (85)	07 (70)	0.372
No	03 (15)	03 (30)	
Diabetes Mellitus			
Yes	16 (80)	08 (80)	<0.001
No	04 (20)	02 (20)	
Menopause			
Yes	13 (65)	08 (80)	0.675
No	07 (35)	02 (20)	
Hysterectomy			
Yes	18 (90)	06 (60)	0.050
No	02 (10)	04 (40)	
Gynecological surgery			
Yes	16 (80)	07 (70)	0.023
No	04 (20)	03 (30)	
Smoking			
Yes	03 (30)	04 (20)	0.657
No	07 (70)	16 (80)	
Physical activity			
Yes	03 (15)	02 (20)	0.001
No	17 (85)	08 (80)	

*Fisher's exact test

The analysis of the clinical variables (quantitative) showed a difference between the groups of participants with SUI and MUI in relation to: BMI ($p=0.043$), waist circumference ($p<0.001$) and the severity ISI score ($p<0.001$), as verified in the results shown in Table 4.

Table 4 - Analysis of means of the age, clinical, and severity variables, according to the type of urinary incontinence. Recife, PE, Brazil, 2019

Variables	Type of UI		t-student	p-value*
	SUI Mean±SD	MUI Mean±SD		
Age	56.6 ± 15.76	55.8 ± 13.01	0.15	0.877
Weight	71.5 ± 11.74	69.9 ± 9.44	0.39	0.718
Height	164.3 ± 6.60	159.3 ± 5.85	2.03	0.059
BMI	28.6 ± 4.07	26.4 ± 3.53	2.11	0.043
Abdominal circumference	103.4 ± 14.46	101.1 ± 18.01	2.04	<0.001
Number of pregnancies	4.7 ± 2.40	3.4 ± 1.77	1.38	0.179
Number of deliveries	4.1 ± 2.26	3.1 ± 1.55	1.05	0.046
ISI score	7.5 ± 2.95	2.9 ± 0.99	4.81	<0.001

*Student's t test

DISCUSSION

Urinary incontinence is a common condition among women and, depending on its severity, can have a serious impact on health-related quality of life. Its treatment begins with early identification and due classification by type and severity. Similar to other diseases, epidemiology is important to reveal the risk factors that mitigate or mediate the onset and progression of urinary incontinence (UI).

In this study, conducted from a population of women who sought urodynamic service, a mean age of 56.2 years old was observed, a result that agrees with the findings of a study carried out in the Family Health Strategy, in the inland of São Paulo. In this regard, a systematic review emphasizes that age is an independent risk factor for UI⁽²⁾.

Although there is a general belief that UI is experienced almost exclusively by older adult women⁽²⁾, our results show the occurrence of this condition in middle aged women. In agreement with this, a study carried out with women attended at a gynecological clinic in the Piauí found a higher prevalence in those aged between 30 and 48 years old⁽⁷⁾, that is, even younger than those in this study. These results draw the attention to the need for the early assessment of this condition.

Skin color/Race has been considered among the non-modifiable risk factors, pointing out that the white Caucasian ethnicity would increase the susceptibility to UI while the black ethnicity would protect against it⁽¹²⁾. The results herein presented demonstrate a higher frequency of women self-declared as white-skinned, in agreement with the results of a study carried out in Rio Grande do Sul⁽¹³⁾ and of another conducted in the United States, which even estimated a higher risk for white women to develop stress-induced UI, and for black women to develop urge UI⁽¹⁴⁾. However, our results are inconsistent with those presented by a study carried out in the same region⁽⁷⁾, which showed a higher frequency of brown-skinned women.

There are few studies that consider schooling as a risk factor for UI. Our findings showed a higher frequency of women who had attended elementary school and this was significantly associated with the occurrence of stress-induced UI. Although we are not aware of any other studies that analyzed the association of this variable with the types of

UI, the frequency found here is in agreement with the results of other studies carried out in Saudi Arabia⁽¹⁵⁾ and in Brazil⁽⁷⁾.

A higher frequency of low income was also observed among the participating women and, although there was no association with the occurrence of UI, possibly due to the number of the population studied, this variable deserves to be better investigated in future studies, given its importance with regard to treatment and strategies to contain urinary loss.

According to the literature, there are two challenges involved in defining UI and its subtypes. One is the ability to distinguish between normal and lower urinary tract function. The second is to establish valid disease subtypes, which differ by etiology, pathophysiology, expression, and treatment options⁽¹⁶⁾.

On the other hand, UI subtypes raise etiological questions about common pathways of initiation, transition, and convergence to the final stage. Stress-induced UI is defined as urine loss associated with activities such as coughing, sneezing, standing up or laughing; Urge UI is defined as urine loss associated with a strong urge to urinate and, finally, Mixed UI has characteristics of both⁽¹⁶⁾.

The use of the Gaudenz-Fragebogen instrument allowed for the identification of a higher frequency for stress-induced urinary incontinence when compared to urge incontinence, and this finding corroborates the percentage found in a systematic review study, which estimated a rate of 12.5% to 79% of SUI⁽¹⁷⁾. About this, it has been postulated that, although the prevalence of UI increases with age, the prevalence patterns differ according to the subtype. As a result, the prevalence of stress-induced UI is peaking during the 50s and declines thereafter⁽¹⁸⁾.

Stress-induced urinary incontinence, that is, the involuntary loss of urine in sufficient quantity or frequency to constitute a social and/or health problem, is a heterogeneous condition, which changes in severity, ranging from small amounts to continuous urine outflow. It can result from urethral hypermobility and downward displacement of the bladder neck when there is a weakening of the supporting musculature⁽¹⁹⁾.

As for the severity of urinary loss, according to the results of the application of the ISI instrument to the population studied, there was a higher frequency for moderate severity followed by severe, and the comparison of women with stress-induced urinary incontinence with those who had urge urinary incontinence showed a significant association of the severe status for women with SUI.

We are not aware of any Brazilian studies evaluating the association related to the severity of urinary loss by UI subtype. However, an international study highlights that the majority of women in the early stages, that is, mild to moderate, do not seek care and, when they finally do, they show advanced symptoms⁽²⁰⁾; at this point, there is a loss of opportunity to develop and implement mitigating interventions to delay or reverse the progression of the disease.

Diabetes Mellitus was present in the highest frequency of the study participants and a statistically significant association was observed with the occurrence of stress-induced UI. Diabetic neuropathy weakens the pelvic floor muscles, resulting in the inability to effectively control urine release, which would explain this finding⁽²¹⁾.

On the other hand, it should be noted that dyslipidemia and obesity are generally associated with chronic diseases such as Diabetes Mellitus, which would also explain the presence of this disease in the study participants. In fact, the BMI measure showed an overweight state for the mean of the studied population, and was significantly associated with the occurrence of stress-induced UI, in the same way as abdominal circumference. The association between BMI and intra-abdominal and intravesical pressure suggests that obesity can stress the pelvic floor secondary to a chronic state of increased pressure⁽²²⁾.

Among the modifiable factors, limited data are available to suggest which of them could reduce the development of UI, but regular physical exercise, in addition to diet, has been identified as a protective factor for the condition⁽²³⁾. Specifically about SUI, physical activity is a modifiable risk factor, with the potential for positive and negative effects. In this study, the lack of physical activity was significantly associated with SUI occurrence.

In a study conducted in Santa Catarina with older adult women with urinary incontinence, a lower level of habitual physical activity was associated with more frequent urinary loss⁽²⁴⁾. In middle-aged women, a slight increase in the chance of SUI was observed only after the substantial increase in physical activity⁽²⁵⁾.

The gynecological and obstetric history has been classically associated with the occurrence of UI in women and has been explored for different aspects. The results herein found demonstrated that a number of deliveries greater than four, and a history of gynecological surgery, specifically hysterectomy, are associated with the effort subtype. With regard to the number of deliveries and its association with SUI, it is probably due to the injury of the pelvic floor by the compression of fetal parts against maternal tissues, determining the section and stretching of muscles and nerves, as well as a structural breakdown of connective tissue and fasciae, altering the entire pelvic statics, subsequently causing urinary loss⁽²⁶⁾.

In turn, as the reproductive and urinary systems in women are closely related anatomically and embryologically, the potential risk of damage to the urinary tract is always a concern during gynecological surgery, with abdominal hysterectomy and reconstructive vaginal surgery being the main procedures associated to urinary incontinence⁽²⁷⁾. This would explain the association found in this study between gynecological surgery, hysterectomy, and SUI.

The study limitation is the fact that the Gaudenz-Fragebogen instrument does not identify the mixed urinary incontinence type. Further studies are recommended with larger samples from other levels of cares.

FINAL CONSIDERATIONS

According to the recommendations of the V International Conference on Incontinence, women with uncomplicated UI, who represent the large majority, should be treated in principle by general practitioners or family doctors, nurses, and physiotherapists. Thus, understanding the effect of the risk factors on the pelvic floor allows us to implement preventive strategies and properly advise on the prevention of UI.

The results of this study allowed us to identify a higher frequency of stress-induced urinary incontinence among women who sought the urodynamic study service, with severe urinary loss. The identified risk factors guide that the interventions regarding the prevention of UI and the strengthening of the pelvic muscles should be aimed at women who are in menopause, overweight, with a history of multiparity, and who underwent hysterectomy or other gynecological surgery.

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