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Sexual repercussions, anxiety and depressive symptoms, bowel function, and quality of life in women with stress urinary incontinence: a cross-sectional study

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ABSTRACT

Introduction: The International Continence Society (ICS) classifies urinary incontinence (UI) as any involuntary loss of urine, and it is classified into three subtypes. One of the main factors for the occurrence of SUI is pelvic floor dysfunction (PFD). **Objective:** To analyze whether there is a difference between women with stress urinary incontinence and continent women in relation to evacuation function, quality of life (QoL), sexual function, and the manifestation of symptoms of anxiety and depression. **Methods:** Cross-sectional observational study with a quantitative approach and descriptive and inferential analysis. The following instruments were applied: Female Sexual Function Index (FSFI), International Consultation Incontinence Questionnaire - Short Form (ICIQ-SF), a questionnaire based on the ROME III Criteria (CRIII), Beck Anxiety Inventory (BAI), and Beck Depression Inventory II (BDI-II). **Results:** The sample consisted of 70 participants, divided into two groups, incontinence group (IG=38) and the control group (CG=32). The results of the intergroup comparison analysis: the mean age in the IG was 42.9 ± 12.7 and in the CG 32.2 ± 13.7 years. QoL was impaired in women with SUI ($p < 0.001$). Variables with significant differences related to SUI were submitted to correlation analysis. The higher the age, the greater the relationship with menopause ($p < 0.001$), number of pregnancies ($p < 0.001$), in addition to the worse QoL ($p < 0.05$). **Conclusion:** The study showed that continent women had a better quality of life. It was noted that both groups had means below the index, suggesting sexual dysfunction. It was also observed that women with SUI had an association with constipation.

Keywords: urinary incontinence; sexuality; Quality of Life; Constipation; anxiety.

INTRODUCTION

The International Continence Society (ICS) classifies urinary incontinence (UI) as any involuntary loss of urine, which is classified into three subtypes^{1,2}.

Stress urinary incontinence (SUI) is defined as involuntary urine leakage secondary to increased intra-abdominal pressure, which results in increased intravesical pressure exceeding the maximum urethral closure pressure, due to physical exertion or activity, including sports, sneezing, or coughing. It is the most common subtype of UI and has the greatest impact on quality of life. Urge urinary incontinence (UUI) is characterized by urgency preceding urine loss, usually accompanied by urinary symptoms such as increased frequency and nocturia. Mixed urinary incontinence (MUI) is established as a manifestation of both types³.

It has been observed that there is a lower prevalence of UI in Asia, with prevalence rates ranging from 1.5% to 15.2%, compared to Europe and America, with rates ranging from 1.8% to 30.5% and 1.7% to 36.4%, respectively³. In developing countries, the prevalence of UI is approximately 25.7%, and 4.7% for SUI⁴. In Brazil, it is estimated that 37% of women up to middle age experience urine loss, and in elderly women this estimate can reach up to 72%, considering aggravating factors such as the lack of demand for treatment in a percentage of this population, due to social embarrassment⁵.

One of the main factors contributing to the occurrence of SUI is pelvic floor dysfunction (PFD). PFD is a global medical problem that encompasses several disorders. It refers to the combination of symptoms and anatomical changes related to pelvic floor muscle (PFM) dysfunction. Such dysfunctions manifest as increased, decreased, or uncoordinated activity of the pelvic floor muscles, which causes mild to severe disability in women's lives.⁶

PFDs can be classified based on 1) symptoms—related to the lower urinary tract, anorectal, genital, and sexual; 2) function—they can be classified as hypertonic or hypotonic based on increased, decreased, or altered PFM activity⁶.

Sexual health involves factors such as quality of life, sexual satisfaction, desire, arousal, and lubrication. Sexual dysfunction is a prevalent problem in women with SUI, affecting their relationship with their partner and reducing their quality of life. Therefore, questionnaires such as the Female Sexual Function Index (FSFI) can be used to assess the sexual function of women with SUI⁷.

Therefore, this study aimed to analyze whether there is a difference between women with stress urinary incontinence and continent women in relation to bowel function, quality of life, sexual function, and the manifestation of symptoms of anxiety and depression.

METHODS

Study design

This was a cross-sectional observational study with a quantitative approach. Descriptive and inferential analyses were performed to interpret the data. This study was approved by the Research Ethics Committee (CEP) of the Institute of Health Sciences (ICS) of the Federal University of Pará (UFPA), whose CAAE: 77993223.5.0000.0018 and approval number 6,766,964. The participants were informed about the research, and those who agreed formalized their acceptance by signing a free and informed consent form.

Participants

Women were recruited voluntarily through online registration using a form posted on social media or through referral from the Women's and Children's Health Care Center (Casmuc)

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located in the metropolitan region of Belém, PA, on the UFPA-Guamá campus in the Amazon, participated in the sample composition.

Selection criteria

The following inclusion criteria were defined: being aged 18 years or older, with or without UI, and sexually active, excluding women with neurological conditions explaining UI (such as spinal cord injuries, sequelae of stroke, or tumors), pregnant women, and women who had not been sexually active for at least one month. Subsequently, all participants received a verbal and written explanation of the research objective and signed the Informed Consent Form (ICF), thus confirming their participation by signature.

Data collection

Data collection took place between November 2023 and May 2024 at Casmuc, a health service specializing in care for women and children, linked to the Faculty of Medicine (Famed) of the Institute of Medical Sciences (ICM) at UFPA. The study was divided into two stages: 1) participants were recruited, advertised on social media, through flyers, and through referrals from Casmuc. 2) It consisted of the evaluation of patients using validated and translated instruments.

Initially, patient recruitment took place in two ways. The first was through referrals from Casmuc services, ensuring greater diversity in the sample. The second was through online registration, where interested parties filled out a form with their contact details and waited for the team to get back to them to schedule an assessment, thus broadening the scope of the selection.

Next, the physiotherapeutic assessment was conducted by tenth-semester students, who were trained in the application of questionnaires under the supervision of the researcher in charge. A structured assessment form was used to obtain data on socioeconomic/demographic

profile, clinical history, lifestyle habits, gestational history, menstrual history, sexual health, and genitourinary symptoms.

Next, the Portuguese versions that had been translated and validated of the following instruments were applied: Female Sexual Function Index (FSFI), International Consultation Incontinence Questionnaire - Short Form (ICIQ-SF), a questionnaire based on the Rome III Criteria (CRIII), and the Beck Scales - Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI).

The FSFI questionnaire is a multidimensional measurement tool used to assess female sexual functioning (FSF) over the past four weeks⁸. The FSFI has been validated in several languages following methodological guidelines for cross-cultural adaptation⁹, and is considered the gold standard for assessing female sexual function¹⁰. It contains 19 questions covering six aspects of sexuality: (I) desire - 2 items, (II) arousal - 4 items, (III) lubrication - 4 items, (IV) orgasm - 3 items, (V) satisfaction - 3 items, and (VI) pain - 3 items⁸. A person who has not had sexual activity in the last 4 weeks scores zero. A higher score means better sexual function^{8,11}. To define sexual dysfunction in the FSFI, values equal to or less than 26.55 points were used¹⁰.

The ICIQ-SF is a self-administered questionnaire, translated and validated into Portuguese by Tamanini et al.¹² in accordance with the standards for questionnaire adaptation and validation. This instrument assesses the impact of UI on quality of life and characterizes urinary loss in the patients analyzed¹³. The total score ranges from 0 to 21 points and can be classified as mild impact (1-5), moderate impact (6- 12), severe impact (13-18), and very severe impact (19-21). Higher scores indicate a greater impairment in quality of life¹⁴.

The Beck Scales are four scalar measurement instruments: the depression inventory (BDI), anxiety inventory (BAI), hopelessness scale (BHS), and suicidal ideation scale (BSI)¹⁵. However, for this study, only the anxiety and depression inventories were used, both translated

and validated according to the principles established for cross-cultural adaptation of instruments. The BDI is a self-report scale with 21 items with scores ranging from 0 to 3, implying increasing degrees of severity of depressive symptoms. The score is obtained from the sum of the items, ranging from 0 to 63, with higher scores indicating more severe symptoms. Symptoms can be classified as minimal (0-11), mild (12-19), moderate (20-35), and severe (36-63). The BAI is a self-report scale of 21 items on a 4-point scale, which are descriptive statements of anxiety symptoms that the subject must self-assess. The score ranges from 0 to 63, with higher scores indicating more severe symptoms. Symptoms can be classified as minimal (0–10), mild (11–19), moderate (20–30), and severe (31–63)¹⁵.

The CRIII is a research and clinical care tool that provides a basis for understanding the pathophysiological aspects, diagnosis, and treatment of functional gastrointestinal disorders¹⁶. A questionnaire based on the CRIII was used for the study in order to standardize the responses of the research volunteers. Although the Rome IV criteria were published in 2016, the Rome III criteria were used; for this study, the Rome III criteria met the objectives¹⁷. The questionnaire consisted of a Likert scale from 0 to 4, where 0 was “never or rarely,” 1 was “sometimes,” 2 was “frequently,” 3 was “most of the time,” and 4 was “always.” It contained six items that considered: evacuation effort, stool appearance, sensation of evacuation, perception of anorectal obstruction, and maneuvers to facilitate defecation, as well as one item that investigates the number of weekly bowel movements and two items that investigate the use of medication for bowel movements and whether colorectal surgery was performed, with a “yes” or “no” response.

Variables

In this study, SUI was considered the independent variable, while sexual function and all its domains, QoL, and psychological symptoms were considered as dependent variables.

Sampling

In this study, a non-probabilistic convenience sampling method was used to select individuals.

Statistical analysis

The collected data were organized in a spreadsheet and subjected to descriptive and inferential statistics. In the descriptive analysis, categorical variables were presented by absolute frequency (n) and relative frequency (%). Quantitative variables were presented according to data normality in mean and standard deviation (parametric) and median and interquartile range (nonparametric). Data normality was assessed using the Shapiro-Wilk test. The following tests were used for intergroup comparison: a) unpaired t-test (parametric and quantitative); b) Mann-Whitney (non-parametric and quantitative); Chi-square (qualitative or categorical). In addition, the correlation between variables was performed using Pearson's (r) (parametric) and Spearman's (rs) (non-parametric) tests. Missing data were treated by excluding incomplete cases (listwise deletion), maintaining the consistency of the statistical analyses.

RESULTS

In this study, the sample consisted of 70 participants, divided into two groups: the incontinence group (IG=38) and the control group (CG=32), as shown in Figure 1.

Table 1 shows the results of the descriptive analysis from the intergroup comparison. The mean age in the IG was 42.9 ± 12.7 and in the CG 32.2 ± 13.7 years. Younger women were less likely to have SUI ($p=0.001$). Single women had fewer SUIs, and divorced women had the highest prevalence of SUIs ($p=0.004$). Women with incomplete higher education were less likely to have SUI ($p=0.008$). However, women with a complete high school education had

more SUIs ($p=0.008$). Women with SUI had a higher number of pregnancies ($p=0.009$). Postmenopausal women had a higher amount of SUI ($p=0.015$). SUI significantly impaired QoL ($p<0.001$). Women with SUI reported “always” having hard or fragmented stools in CRIII ($p=0.023$). Regarding urinary symptoms, the number of pad changes per day ($p=0.017$), stress incontinence ($p<0.001$), and pad use ($p=0.004$) were significantly higher in women with UI.

Next, the variables with significant differences related to SUI were submitted to correlation analysis, as shown in Table 2. The older the age, the greater the relationship with menopause ($p<0.001$), number of pregnancies ($p<0.001$), use of pads and changing pads, in addition to the greater impact of SUI on QoL ($p<0.05$). Divorced and widowed women were more related to higher education ($p<0.05$). Higher education was more associated with postmenopausal women ($p<0.05$) and a higher number of pregnancies ($p<0.05$). Postmenopausal women had a higher number of pregnancies ($p<0.001$). The use of panty liners was more associated with a higher number of changes and worse QoL ($p<0.001$).

DISCUSSION

In this study, several methodological strategies were adopted to minimize possible biases. Participants were carefully selected to ensure the inclusion of individuals who met the predefined criteria. Validated and translated instruments were used for data collection to ensure greater reliability of the information. In addition, the researchers responsible for administering the questionnaires received prior training to standardize the approach and minimize the risk of subjective interpretations.

The study aimed to analyze whether there is a difference between women with stress urinary incontinence and continent women in relation to bowel function, quality of life, sexual function, and the manifestation of symptoms of anxiety and depression. It is known that urinary

incontinence affects women more and is a disorder that can affect them at all stages of life. Although it is not a life-threatening condition, it still negatively affects women's quality of life¹⁸.

In this study, the IG group was mostly composed of married women who had already given birth and described themselves as being in menopause, with complete secondary and higher education. Meanwhile, the CG group was mostly composed of single women who had not given birth, postmenopausal women, and women with incomplete higher education.

This study showed that women with UI had a higher number of pregnancies compared to continent women. Pregnancy is an important risk factor for UI, especially during late pregnancy¹⁹. Physiological changes during pregnancy, such as increased abdominal pressure and progesterone levels, and pelvic floor injuries, can make women more susceptible to UI. Therefore, all women who have one or more children can be considered at risk for subsequent incontinence²⁰. A study by Vesentini et al.¹⁹ on UI in pregnant women showed that UI has harmful effects on the quality of life of pregnant women, worsening with increasing gestational age. In addition, compared to nulliparous women, women with a history of vaginal delivery were more likely to suffer from incontinence during pregnancy.

In this study, UI was associated with older women, having a greater impact on QoL, in accordance with the study by Steibliene et al.²¹ Women living with SUI had significantly lower QoL compared to controls. Psychological effects include anxiety, worry, despair, stress, mood swings, and low self-esteem. Physical consequences include a feeling of wetness, soiled clothing, unpleasant odor, and skin sensitivity. These symptoms significantly impact quality of life and daily activities. In addition, fear of incontinence negatively affects daily activities such as traveling, shopping, playing with children, practicing sports, and sexual activities due to the stress and shame associated with the condition²².

In the study by Ural et al.²³, a cross-sectional study involving 1,397 female university students aged between 18 and 28 years, the aim was to investigate the prevalence and potential risk factors for UI in university students without risk factors. QoL was assessed using the ICIQ-SF. The results showed an association between the severity of UI and a history of constipation.

In this study, the impact of SUI on QoL was worse in women who had SUI and, according to the CRIII, who “always” had the symptom of hard or fragmented stools when compared to continent women. Ramalingam et al.²⁴ explain that constipation causes an increase in intra-abdominal pressure, leading to an increase in intravesical pressure and, as a result, exceeding the occlusion pressure of the urethra. Chronic increased intra-abdominal pressure weakens the PFM, leading to SUI.

According to Jácome et al.²⁵ urinary incontinence and sexual dysfunction can occur at any stage of life and can cause discomfort, frustration, and fear of sexual activity, leading to decreased sexual desire and self-esteem. The results of a meta-analysis on women with urinary incontinence indicated that this condition had adverse impacts on women's intimacy and sexual satisfaction. In addition, it was observed that urinary incontinence resulted in changes in how they experience their sexuality and sexual function²⁶. According to Felipe et al.²⁷ lower FSFI scores were associated with the severity of incontinence, as well as symptoms that impact female sexuality, such as decreased libido, vaginal dryness, and pain during sexual intercourse. These symptoms contribute to psychological insecurity and hurt the quality of life of affected women²⁸. However, regarding FSFI scores, there was no significant impact on both the IG and CG in the present study. Nevertheless, both groups had an average below the cut-off score, which may indicate sexual dysfunction.

It is known that aging plays an important role in reducing sexual activity, from desire to various other aspects of sexuality²⁷. In this study, it was found that the domains of desire and

orgasm were impaired in the IG. These findings are consistent with the literature, indicating that decreased desire reduces the likelihood of interest in sexual relations and compromises pleasure during sexual intercourse with a partner. In the study by Felipe et al.²⁷, age was identified as an isolated predictive factor for sexual dysfunction. The association between premenopausal and menopausal states with decreased estrogen levels may be related to reduced sexual desire. In a study conducted by Rodrigues et al.²⁹, it was observed that menopausal women tend to avoid sexual activities as a strategy to reduce genitourinary discomfort, such as genito-pelvic pain/penetration disorder.

Regarding the Beck scales, throughout this study, there was no significant difference between the IG and CG for symptoms of anxiety and depression. However, the results of the meta-analysis by Cheng et al.²⁶ showed that both depression and anxiety are higher in people with UI than in those without UI. UI can lead to a variety of disorders, such as anxiety, depression, and social isolation. The experience of UI can result in feelings of anxiety and depression due to social embarrassment and limitations in daily activities²⁵.

In this study, it was observed from the mean ages that the IG group was composed of older women, and an association was found between age, menopause, and the presence of stress urinary incontinence. In the study by Russo et al.³⁰ it was found that menopause and aging are strongly associated with the onset or worsening of lower urinary tract dysfunction. Sex steroid hormones regulate the function of the lower urinary tract, where their receptors are widely distributed, especially in structures involved in urinary continence, such as the urethra, vagina, and pelvic floor muscles²⁹.

According to Alizadeh et al.¹⁸ estrogen and collagen deficiency result in decreased pelvic floor elasticity, atrophic changes, and urinary incontinence. Advanced age, usually coinciding with menopause, also has debilitating effects on pelvic organs and tissues¹⁸.

There were limitations regarding the sample size of the study, which can be explained by the inclusion criteria related in particular to sexual function analyses, given that to participate in the research, all participants had to be sexually active, and some incomplete questionnaires made available through online forms, such as the variables “obesity” and “type of childbirth, presented high proportions of missing data. In addition to the limitations mentioned, selection bias may have occurred due to recruitment on a voluntary basis, which may limit the representativeness of the sample.

Conclusion

Regarding sexual function, women with SUI and continent women had scores below the index, suggesting sexual dysfunction. There was no statistical difference between continent and incontinent women in responses related to symptoms of anxiety and depression. However, women with SUI showed an association with constipation. SUI is associated with multiparity and menopause. Continent women report a better quality of life.

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Figure 1: Flowchart of the number of individuals included in the study.

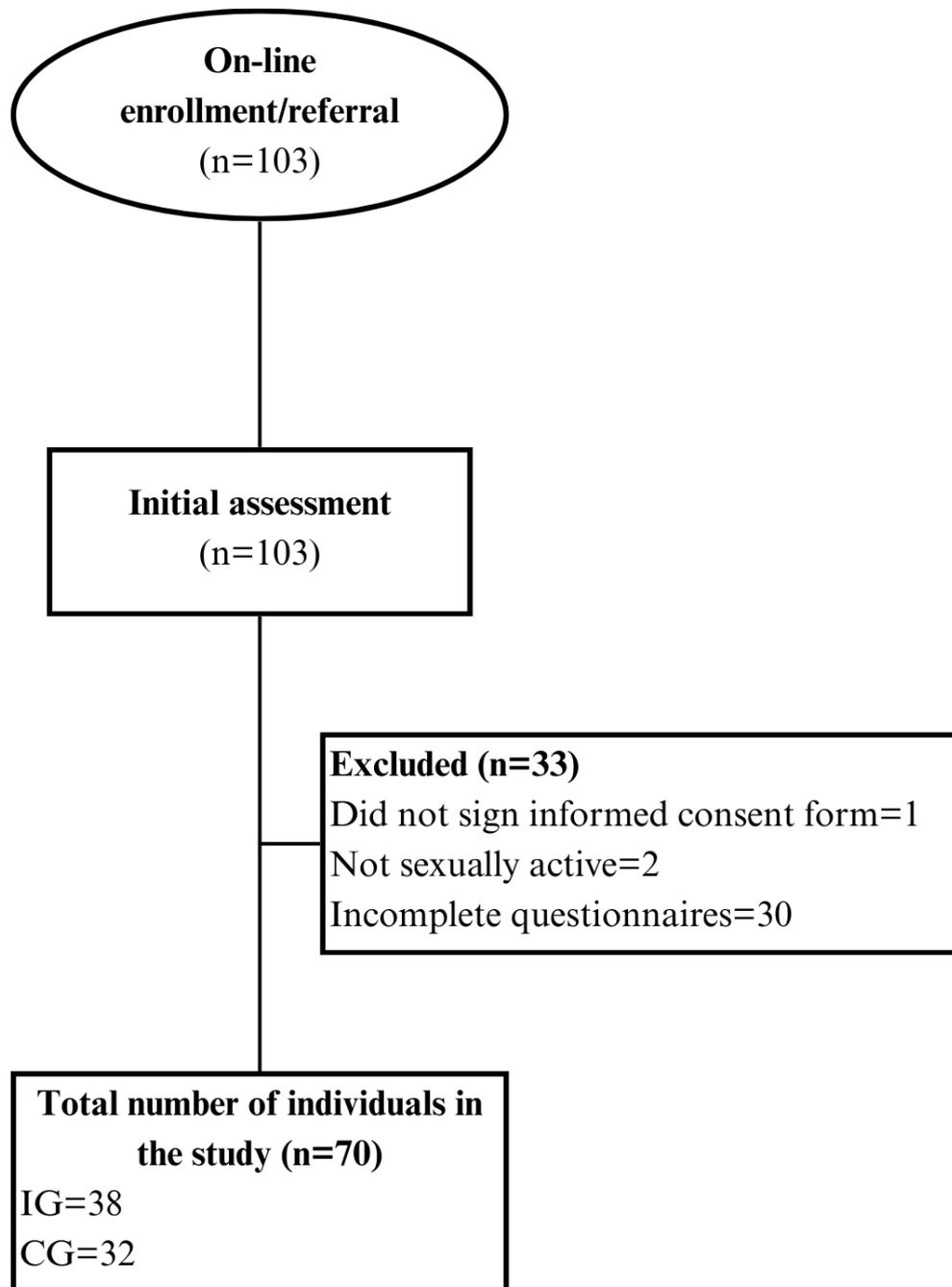


Table 1: Characteristics associated with urinary incontinence. Belém (PA), Brazil, 2023-2024

Feature	IG (n=38)	CG (n=32)	t or U or χ^2	p-value*
Age	42.92 (\pm 12.6)	32.16 (\pm 13.7)	-3.413	0.001*
Marital status			15.254	0.004*
Married	11 (73.3)	4 (26.7)		
Single	13 (34.2) ^a	25 (65.8) ^b		
Common-law marriage	7 (70.0)	3 (30.0)		
Divorced	6 (100.0) ^a	0 (0.0) ^b		
Widow	1 (100.0)	0 (0.0)		
Education			13.804	0.008*
Incomplete High School	1 (25.0)	3 (75.0)		
Complete High School	14 (77.8) ^a	4 (22.2) ^b		
Technical Education	0 (0.0)	2 (100.0)		
Incomplete Higher Education	9 (34.6) ^a	17 (65.4) ^b		
Complete Higher Education	14 (70.0)	6 (30.0)		
Number of pregnancies	2.05 (\pm 1.50)	1.00 (\pm 1.77)	-2.682	0.009*
Smoking			1.205	0.272
Yes	0 (0.0)	1 (100.0)		
No	38 (55.1)	31 (44.9)		
Alcohol consumption			0,921	0,337
Yes	17 (48.6)	18 (51.4)		
No	21 (60.0)	14 (40.0)		
Physical activity			2.221	0.329
Does not practice	12 (66.7)	6 (33.3)		
Irregular	12 (57.1)	9 (42.9)		
Regular	14 (45.2)	17 (54.8)		
Amount of water per day			0.763	0.683
Less than 1L	8 (50.0)	8 (50.0)		
1 to 2L	24 (58.5)	17 (41.5)		
More than 2L	6 (46.2)	7 (53.8)		
Menopause	19 (73.1) ^a	7 (26.9) ^b	5.886	0.015*
<i>Score ICIQ-SF</i>	9.13 (\pm 5.24)	1.91 (\pm 2.98)	-6.906	<0.001*
<i>CRIII</i>				
Number of Weekly Evacuations	6.00 (4)	4.00 (9)	579.000	0.729
Evacuation effort			0.505	0.973
Never or rarely	15 (57.7)	11 (42.3)		
Sometimes	15 (50.0)	15 (50.0)		
Often	3 (60.0)	2 (40.0)		
Most of the time	2 (50.0)	2 (50.0)		
Always	3 (60.0)	2 (40.0)		
Hard or fragmented stools			11.289	0.023*
Never or rarely	11 (40.7)	16 (59.3)		
Sometimes	17 (65.4)	9 (34.6)		
Often	1 (46.7)	5 (83.3)		
Most of the time	4 (66.7)	2 (33.3)		
Always	5 (100.0) ^a	0 (0.0) ^b		

Table 1: Characteristics associated with urinary incontinence. Belém (PA), Brazil, 2023-2024 (continuation)

Feeling of incomplete evacuation			7.201	0.126
Never or rarely	16 (61.5)	10 (38.5)		
Sometimes	12 (48.0)	13 (52.0)		
Often	1 (16.7)	5 (83.3)		
Most of the time	6 (85.7)	1 (14.3)		
Always	3 (50.0)	3 (50.0)		
Feeling of anorectal obstruction or blockage			1.868	0.760
Never or rarely	25 (52.1)	23 (47.9)		
Sometimes	8 (57.1)	6 (42.9)		
Often	2 (50.0)	2 (50.0)		
Most of the time	2 (100.0)	0 (0.0)		
Always	1 (50.0)	1 (50.0)		
Manual maneuvers to facilitate evacuation			1.328	0.857
Never or rarely	26 (57.8)	19 (42.2)		
Sometimes	7 (53.8)	6 (46.2)		
Often	2 (50.0)	2 (50.0)		
Most of the time	1 (50.0)	1 (50.0)		
Always	2 (33.3)	4 (66.7)		
Laxative medication			0.554	0.456
Never or rarely	37 (55.2)			
Sometimes	1 (33.3)			
Colorectal surgery			2.639	0.104
Never or rarely	35 (52.2)			
Sometimes	3 (100.0)			
Number of pad changes per day	0 (1)	0 (0)	485.000	0.017*
Post-void dribbling	23 (59.0)	16 (41.0)	0.780	0.377
Stress urinary leakage	38 (100.0) ^a	0 (0.0) ^b	70.000	<0.001*
Pad use	11 (91.7) ^a	1 (8.3) ^b	8.155	0.004*
FSFI domains				
Desire	3.00 (2)	2.00 (2)	519.500	0.285
Arousal	4.00 (3)	3.00 (4)	476.500	0.112
Lubrication	4.00 (5)	4.00 (5)	517.500	0.271
Orgasm	3.00 (5)	3.00 (5)	547.500	0.467
Satisfaction	5.00 (3)	3.00 (4)	537.000	0.391
Pain	4.00 (6)	3.00 (5)	535.500	0.367
Total	24.00 (21)	18.00 (19)	493.500	0.177
BAI	7.00 (19)	17.00 (27)	601.500	0.939
BDI	12.00 (16)	17.00 (16)	576.500	0.710

^{a, b} represent the difference between groups.

Table 2: Correlation coefficients of characteristics associated with the presence of urinary incontinence. Belém (PA), Brazil, 2023-2024.

	Age	Marital status	Education	CRIII - Hardened stool	Menopause	Number of pregnancies	US - Pad use	US - Number of trades
Marital status (<i>r</i>)	-0.016							
Education (<i>r</i>)	0.185	-0.388*						
CRIII - Hardened stool (<i>r</i>)	0.011	0.147	-0.018					
Menopause (<i>r</i>)	0.786**	0.017	0.400*	0.123				
Number of pregnancies (<i>r</i>)	0.610**	-0.009	0.363*	0.242	0.425**			
US - Stress urinary leakage (<i>r</i>)	-	-	-	-	-			
US - Pad use (<i>r</i>)	0.374*	-0.038	0.098	-0.014	0.174	0.158		
US - Number of trades (<i>rs</i>)	0.358*	0.054	0.146	-0.130	0.184	0.184	0.864**	
Score ICIQ-SF (<i>r</i>)	0.373*	0.043	0.088	0.054	0.249	0.259	0.466**	0.237

US - Urinary symptoms. * $p < 0.05$; ** $p < 0.001$; r = Pearson correlation; rs = Spearman correlation.