



PREVALENCE OF URINARY INCONTINENCE AND ASSOCIATION WITH OBESITY IN WOMEN ENROLLED IN A TEACHING ASSISTANCE UNIT IN MACEIÓ-AL

ORIGINAL ARTICLE

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ABSTRACT

The incidence of overweight and obesity as well as markers of Chronic Noncommunicable Diseases (NCDs) has grown in recent decades. Obesity, in addition to being associated with non-communicable chronic diseases such as diabetes and hypertension, can be considered a risk factor for the development of disorders in the supporting structures of the abdomino-pelvic viscera, which can lead to complications such as Urinary Incontinence (UI) and genital prolapses. The association between incontinence and obesity is still poorly studied. Due to the relevance of the theme, this study was proposed, which aimed to investigate the prevalence of urinary incontinence in women enrolled in a care unit in the city of Maceió and to verify the association with obesity. This is an observational, analytical, cross-sectional study, with women between 18 and 60 years old, enrolled in a Teaching Care Unit in the City of Maceió, from July to September 2017. Women with suspected or confirmed pregnancies were excluded, or who had a neurological disease that resulted in difficulty understanding, hearing or speaking, making it impossible to respond to the questionnaire 109 women participated in the research, with a mean age of 38.1 ± 12.3 , ranging between a minimum age of 18 and a maximum of 59 years. The prevalence of self-reported UI in this population was 17.43%, with no association with obesity being found. It was possible to conclude



that the prevalence of UI is within the percentage described in the literature and that even though no statistically significant association was found between UI and obesity, the number of incontinent, obese or overweight women is high. In addition, UI is increasingly present in young women, as well as obesity, as confirmed in this study.

Keywords: Urinary incontinence, obesity, women.

1. INTRODUCTION

The incidence of overweight and obesity as well as markers of Chronic Noncommunicable Diseases (NCDs) has grown in recent decades. Obesity is not a singular disease, it is a public health problem, since it is considered a risk factor for other morbidities such as diabetes and cardiovascular diseases, important causes of mortality in adults, which increase proportionally with weight gain (SARTORI; DE SOUZA; CARNEIRO, 2011; OLIVEIRA *et al.*, 2010; VIECELLI *et al.*, 2009).

Obesity, in addition to being associated with non-communicable chronic diseases such as diabetes and hypertension, can be considered a risk factor for the development of disorders in the supporting structures of the abdomino-pelvic viscera, which can lead to complications such as urinary incontinence and genital prolapses (DA COSTA; MACHADO; CORDÁS, 2010; FORTI *et al.*, 2011; PIRES, 2013).

Urinary incontinence (UI) is defined as a condition in which there is involuntary loss of urine. This condition is responsible for disorders that lead to hygienic problems, sexual dysfunctions, low professional performance, negatively impacting quality of life. According to the International Continence Society, UI can be classified into Stress Urinary Incontinence (SUI), Urge Urinary Incontinence (UUI) and Mixed Urinary Incontinence (MUI) (DE CARVALHO *et al.*, 2013).

Stress Urinary Incontinence (SUI) is considered the most common type of incontinence in young women, affecting 18% of women aged over 30 years. In obese women, it is the most prevalent type, being characterized by the involuntary loss of



urine, when the intra-vesical pressure exceeds the maximum urethral closing pressure in the absence of contraction of the detrusor muscle. In this type of incontinence, it is very common to experience urine loss in situations such as sneezing, coughing, laughing or even during the practice of physical activities (FROHME *et al.*, 2014).

The association between incontinence and obesity is still poorly studied. Some authors found that obesity is considered a relevant risk factor for the development of SUI, especially in women aged between 37 and 54 years. WING *et al.* (2010) report that weight loss in overweight or obese women has a positive effect on reducing the frequency of SUI episodes.

The mechanism that explains the relationship between UI and obesity is still not well established. It is speculated that excess weight increases intra-abdominal pressure, which is transferred to the bladder, increasing intravesical pressure and urethral mobility, leading to UI. In addition, obesity can affect the neuromuscular function of the genitourinary tract, contributing to urinary complaints (VIECELLI *et al.*, 2009).

Considering that the number of obese women with UI is still underestimated, and that knowing whether or not there is an association between these two conditions is useful to develop specific treatment strategies for this population, this study was proposed, which aimed to investigate the prevalence of incontinence urinary tract in women enrolled in a care unit in the city of Maceió and verify the association with obesity.

2. MATERIAL AND METHOD

This is an observational, analytical, cross-sectional study with women between 18 and 60 years of age, enrolled in a Teaching Care Unit in the City of Maceió, from July to September 2017. Pregnant women or women with suspected pregnancy were excluded, or who had a neurological disease that resulted in difficulty



understanding, hearing or speaking, making it impossible to answer the questionnaire.

The calculation of the sample size was done by consulting the *LEE – Laboratório de Epidemiologia e Estatística* website, considering a prevalence of urinary incontinence of 17%, absolute precision of 5 and significance level of 5%. The calculated sample size was 217, adding 20% for losses and refusals; the minimum sample size was 261 women.

To obtain the sample, the Teaching Care Unit was divided into 6 micro areas. The collection began in the 1st micro-area and only after the completion of the households in this region did the next micro-areas proceed.

Within each micro-area, the census sectors were identified, excluding commercial sectors.

The household selection process was initiated by conglomerates. A certain number of households were visited, systematically conducting interviews with the women, by the researcher herself and by previously trained volunteer graduates in the health area.

If no women aged between 18 and 60 were found in the target households, the researcher continued to the nearest household, continuously, until an eligible woman was identified. If a household was found that had an eligible woman, and she was not present at the time, another visit time was scheduled, at most twice, to consider it as a loss. Faced with the occurrence of more than one woman aged between 18 and 60 living in the household, all were interviewed.

After signing the Free and Informed Consent Term - TCLE[4] (appendix A), based on resolution 466/12, of the National Health Council, Ministry of Health (CNS/MS)[5], through a structured interview, individually, data were collected in each participant's home by only one researcher.



Independent variables, such as sociodemographic and economic aspects, self-reported illnesses, lifestyle and gynecological-obstetric history, were collected using a data collection form.

The independent variables of the study included: age, education, marital status, occupation, *per capita* income, parity, type of delivery, previous urogynecological surgery, presence of chronic disease and type of chronic disease, practice of regular physical activity and daily medication use.

The dependent variable “urinary incontinence” was obtained through the question:

"Have you had urinary leakage at any time in the last twelve months?", making it possible to obtain data on self-reported incontinence.

Waist circumference was also measured using a measuring tape, with the volunteer being asked to stand up and the measuring tape was placed on the umbilical line, the measurement being obtained in centimeters. This measurement shows the visceral fat content and according to the Brazilian Obesity Guidelines (2010), a measurement equal to or greater than 80 cm in women represents an increased risk and greater than or equal to 88 represents a substantially increased risk for the development of cardiovascular disease. Based on the study by Oliveira (2010), the present study considered abdominal obesity to be a circumference above 88 cm.

To check the height, a stadiometer was used on a flat surface without unevenness, asking the volunteer to remain in the standing position.

The Body Mass Index (BMI) was calculated from measurements of weight and height, through the following formula $BMI = \text{weight (kg)} / \text{height}^2 \text{ (cm)}$. And the following BMI cutoff points were adopted, underweight ($BMI < 18.5$); normal weight ($BMI 18.5-24.99$); overweight ($BMI 25-29.99$) and obesity ($BMI \geq 30.00$).



The results were recorded in the database and their respective analyses. Quantitative variables were displayed as mean and standard deviation, while qualitative variables were performed in the form of a frequency table.

Bivariate analyzes were performed to identify a possible association between UI and obesity by BMI and waist circumference measurement.

3. RESULTS

The results presented here refer to partial data analysis, as it was not possible to complete the collection in time due to problems in the micro area where the research was being carried out, totaling 41.7% of the sample calculation.

109 women participated in the research, with a mean age of 38.1 ± 12.3 , ranging between a minimum age of 18 and a maximum of 59 years.

The prevalence of self-reported UI in this population was 17.43% (n=19), with 21% (n=4) reporting having urinary leakage on exertion, 26.3% (n=5) reporting loss associated with urgency urinary incontinence and the majority 52.7% (n=10) indicated that the loss happens both with efforts and with urgency, being suggestive of mixed urinary incontinence.

As for the time of incontinence, 52.7% (n=10) reported that the complaints started less than 1 year ago and 47.3% (n=9) more than 1 year ago. Of these, 47.3% (n=9) reported having to use a daily hygienic protector, while 52.7% (n=10) did not use the protector. Only 1 (5.26%) participant had a diagnosis based on the urodynamic study and 2 (10.52%) of them stated that they had already undergone some treatment for this condition.

Table 1 shows the profile of the women participating in the research, regarding sociodemographic and economic data and lifestyle, according to the presence or absence of urinary incontinence.



Table 1 – Profile of research participants, regarding socio-demographic and economic data and lifestyle, according to the presence or absence of urinary incontinence

		No UI		With UI		TOTAL		p**
Characteristics		n=90	%	n=19	%	n=109	%	
Marital status								
	Single	33	30,3	7	6,4	40	36,7	0,14
	Married	50	45,8	11	10	61	55,9	
	Divorced	3	2,8	0	0	3	2,8	
	Widows	3	2,8	1	0,9	4	3,6	
Occupation								0,27
	From home	46	42,2	9	8,3	55	50,5	
	Employee	20	18,3	6	5,6	26	23,9	
	Student	7	6,4	1	0,9	8	7,3	
	Unemployed	17	15,6	3	2,7	20	18,3	
Level of education								0,33
	Not literate	9	8,3	1	0,9	10	9,2	
	Elementary School	40	36,7	11	10	51	46,7	
	High school	31	28,5	6	5,6	37	34,1	
	University education	10	9,1	1	0,9	11	10	
Per capita income								0,29
	Até 1 salário	67	61,5	13	11,9	80	73,4	
	De 1 a 3	17	15,5	5	4,6	22	20,1	
	Acima de 3 a 5	6	5,6	1	0,9	7	6,5	
	Acima de 5	0	0	0	0	0	0	
Mentioned diseases*								0,33
	Hypertension	23	21,1	6	5,5	29	26,6	
	Diabetes	4	3,6	2	1,8	6	5,5	
	Others	0	0	1	0,9	1	0,9	
	None	63	57,8	10	9,2	73	67	
Routine medication								0,34



	Yes	34	31,2	10	9,2	44	40,4	
	No	56	51,3	9	8,3	65	59,6	
Physical activity								0,25
	Yes	18	16,5	5	4,6	23	21,2	
	No	72	66	14	12,8	86	78,8	

Source: Survey data, 2017. *n*= number of participants. %=percent. *allows more than one alternative. *p*** less than or equal to 0.05.

As for marital status, it was found that most of the incontinent participants were married (11/10%) and then single (7/6.4%) with a smaller number being widows (1/0.9%). Among those without complaints of urinary loss, there was also a predominance of married women (50/45.8%) followed by single women (33/30.3%).

Regarding occupation, most of those with and without incontinence were housewives, followed by employed (20/18.3% - 6/5.6%), unemployed (17/15.6% - 3/2.7 %) and students (7/6.4% - 1/0.9%) for those without and with incontinence respectively.

With regard to the level of education, it was found that the highest number among incontinent (11/10%) and continent (40/36.7%) women were women who studied up to elementary school, followed by those who reported studying up to high school (6/5.6% - 31/28.5%).

With regard to *per capita* income, both among incontinent (13/11.9%) and non-incontinent women (67/61.5%) there was a predominance of up to 1 minimum wage, followed by 1 to 3 wages (5/4, 6% - 17/15.5%) and above 3 to 5 salaries (1/0.9% - 6/5.6%).

Regarding the mentioned diseases, most of the interviewees reported not having any disease in both groups. Among those who reported having diseases, high blood pressure followed by diabetes were the most cited among incontinent and continent



patients. In the incontinent group, most use routine medication (10/9.2%) and in those without incontinence, 56 (51.3%) % do not use daily medication.

As for physical activity, it was found that in both groups - with incontinence (14/12.8%) and without incontinence (72/66%), the majority reported not having the habit of exercising at least three times a week.

Table 2 presents the gynecological-obstetric data of the study participants.

Table 2: Gynecological-obstetric data of the participants according to the presence or absence of urinary incontinence

		With UI (n=19)		Without UI (n=90)		Total (n=109)		p**
Characteristics		N	%	N	%	Nº	%	
Parity								0,02
	Nulliparous	2	1,9	18	16,6	20	18,5	
	Primiparous	5	4,7	20	18,5	25	23,2	
	Multiparous	12	11,1	51	46,9	63	58	
Type of delivery								0,44
	Vaginal	10	9,3	31	28,4	41	37,7	
	None	2	1,8	18	16,5	20	18,3	
	Cesarean section	3	2,7	26	23,8	29	26,6	
	Both	4	3,6	15	13,7	19	17,4	
Previous Surgeries*								0,36
	Abdominal and Pelvic	1	0,9	3	2,8	4	3,7	
	Pelvic	6	5,5	9	8,3	15	13,8	
	Abdominal	2	1,8	7	6,4	9	8,2	
	Perineum	0	0	1	0,9	1	0,9	
	None	10	9,2	70	64,2	80	73,3	

Source: Survey data, 2017. N= number of participants. %=percent.

*allows more than one alternative. p** less than or equal to 0.05



Gynecological and obstetrical data revealed that in terms of parity, incontinent women there was a predominance of multiparous women (12/11.1%) followed by primiparous women (5/4.7%). On the continents there was also a predominance of multiparous women (51/46.9%) followed by primiparous women (20/18.5%) and nulliparous women (18/16.6%).

Of the 17 incontinent women who gave birth, 10 (9.3%) gave birth vaginally, 3 (2.7%) had cesarean sections and 4 (3.6%) had both deliveries. Regarding the 71 continents that gave birth, 31 (28.4%) were vaginal, 18 (16.5%) cesarean sections and 15 (13.7%) had both types of delivery.

As for performing urogynecological surgeries, most incontinent women (10/9.2%) and continent women (70/64.2%) reported not having performed any surgery. Among those who underwent surgery, there was a greater predominance of pelvic surgeries for both groups – incontinent (6/5.5%) and continent (9/8.2%).

Regarding anthropometric data, the mean waist circumference found was 92.06 ± 15.08 cm, with 5 (4.6%) of the incontinent women having a waist circumference less than or equal to 88 cm and 14 (12.8%) greater than 88cm. Among the continents, 39 (35.8%) had a waist circumference less than or equal to 88cm and 51 (46.8%) greater than 88cm. The average weight was 68.82 ± 15.94 kg and the average height was 1.55 ± 0.06 m.

As for BMI, the obese (12/11%) stands out among the incontinent, followed by the eutrophic (6/5.5%), overweight (1/0.9%) and none with low weight. Among continents, most were eutrophic (31/28.5%), followed by overweight (29/26.7%), obese and underweight (2/1.9%).

Table 3 describes the anthropometric characteristics of the studied population, according to the presence or absence of urinary incontinence.

Table 3 - Anthropometric characteristics of the studied population, according to the presence or absence of urinary incontinence

		With UI (n=19)		Without UI (n=90)		Total (n=90)		p*
Characteristics		N	%	N	%	Nº	%	
BMI								0,27
	Low weight	0	0	2	1,9	2	1,9	
	Eutrophy	6	5,5	31	28,5	37	34	
	Overweight	1	0,9	29	26,7	30	27,6	
	Obesity	12	11	27	24,8	39	35,8	
Abdominal circumference								0,21
	≤88 cm	5	4,6	39	35,8	44	40,4	
	>88 cm	14	12,8	51	46,8	65	59,6	

Source: Survey data, 2017. N= number of participants. %=percent.

p* less than or equal to 0.05

Statistical analysis showed a statistically significant correlation between the variables urinary incontinence and parity.

In bivariate analyses, considering the association of UI with BMI and/or waist circumference, it was found that there was no association between the studied variables.

4. DISCUSSION

Data on the prevalence of UI found in the literature are quite variable and reveal a wide spectrum of prevalence rates, which, according to Dedicção *et al.* (2008), is due to the fact that there are variations in the definitions of UI and in the characteristics of the studies and target population.

It is a fact that, in Brazil, there are few studies on the prevalence of UI and its risk factors. The wide range of studies carried out on this subject do not focus on the



relationship between increased body fat and the incidence of urinary leakage, in addition to the possibility of the occurrence of an evolution to urinary incontinence.

The findings of the present research were similar to the study by Oliveira (2010), who also found a prevalence of UI of 17%, with the majority presenting symptoms suggestive of UUI, while in this work there was a greater predominance of MUI. Both studies differ from what is supposed in the literature, which highlights that the most frequent type of UI in obese women would be SUI, which is justified by Silva *et al.* (2011) because in obese women there is an excessive accumulation of body fat that increases blood pressure intra-abdominal muscle overloading the pelvic floor muscles, contributing to an inadequate anatomical support, which would lead to a greater predisposition to urinary loss.

It is important to emphasize that the UI reported by the participant was evaluated and only 1 of them had a diagnostic test for this condition. The diagnosis of UI involves the clinical history, the physical examination and the urodynamic study, which according to Feldner Jr (2006), aims to identify the specific causes of the patients' symptoms, being considered the best diagnostic method for evaluating the function of the urinary tract; however, some authors believe that it is not routinely necessary and prefer to manage their patients based on clinical symptoms.

Another data to be highlighted is that only 2 among the incontinent women reported having undergone some type of treatment for this condition. A study conducted by Da Silva and Lopes (2009) pointed out that most incontinent women do not seek treatment because they consider urine loss to be normal, not considering it something important and the doctor saying that it would not be necessary. The authors concluded that lack of knowledge about the types of treatment may contribute to not seeking professional help.

Most of the interviewees did not mention any disease, but among the incontinent, many reported having systemic arterial hypertension followed by diabetes, common



in overweight and obese women and whose characteristic is not to practice regular physical activity like the population studied. Although this is not statistically significant data for this study, it is known that some medications routinely used by hypertensive patients increase urinary frequency and urgency, acting on the lower urinary tract, with the possibility of altering bladder function, worsening or contributing to the increase in the frequency of urinary loss (HIGA; LOPES and REIS, 2008). Tamanini (2009) also highlights that one of the diseases most associated with UI is diabetes.

The parity variable was the only one that showed a statistically significant association with UI. According to Higa; Lopes and Reis (2006), parity is recognized as the agent that is most concerned about being associated with the development of UI. Incontinence is often present during pregnancy and, when prevalent, there is an increase in parity, favoring UI. In the present study, there was a greater predominance of multiparous women among those who were incontinent and who had vaginal delivery.

According to Barbosa *et al.* (2005), vaginal delivery in primiparous women decreases pelvic floor muscle strength and increases the relative risk of decreased pelvic floor muscle strength 4 to 6 months after delivery.

Regarding anthropometric data, it should be noted that the population studied, regardless of UI, has high measures of abdominal circumference and BMI, which is a worrying fact, since overweight and obesity have increased significantly in recent times in developed countries and also in development, becoming a serious public health problem due to the fact that there are several consequences of obesity.

According to Castro *et al.* (2012), obese women have a greater chance of triggering UI, mainly related to exertion. For Fitz *et al.* (2012) the existing integration between obesity and pelvic floor dysfunctions is related to the body mass index and intra-abdominal pressure, due to the fact that obesity and overweight reach the pelvic



floor due to the chronic increase in intra-abdominal pressure. Obesity generates an accumulation of fat inside the abdomen and induces an increase in intra-abdominal pressure, which is transmitted to the bladder, and intra-vesical pressure, which fatigues and weakens the muscles of the pelvic floor, thus facilitating the loss of urine in situations such as , coughing, sneezing or running.

It is worth considering that even though no statistically significant association was found between UI and obesity, we identified in this research a considerable number of obese or overweight women with a waist circumference above 88 cm, requiring an intervention to modify these health indicators.

5. CONCLUSION

The analysis of the partial results of this research concludes that the prevalence of UI is within the percentage described in the literature and that even though no statistically significant association was found between UI and obesity, the number of incontinent, obese or overweight women is high.

In addition, UI is increasingly present in young women, as well as obesity, as confirmed in this study. Thus, prophylaxis of urinary loss is important in order to avoid its onset and its consequences that negatively interfere with quality of life.

Other studies can be carried out to follow up overweight or obese incontinent women, to assess whether weight loss has a significant impact on reducing urinary complaints.

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APPENDIX - FOOTNOTE

4. Termo de Consentimento Livre e Esclarecido (TCLE).

5. Conselho Nacional de Saúde, do Ministério da Saúde (CNS/MS).



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