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FACTORS ASSOCIATED THE WORSENING OF SYMPTOMS AND QUALITY OF LIFE IN WOMEN WITH URINARY[1]

FATORES ASSOCIADOS COM A PIORA DOS SINTOMAS E DA QUALIDADE DE VIDA EM MULHERES COM INCONTINÊNCIA URINÁRIA

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ABSTRACT

Introduction: Urinary incontinence (UI) greatly affects the quality of life of women. Consumption of citrus fruits and caffeine may worsen symptoms of incontinence. The objective was to determine risk factors associated with incontinence, assess quality and life, as well as verify whether caffeine and ascorbic acid worsen the symptoms of incontinent women. **Materials and methods**: A cross-sectional study was carried out at a basic health unit in Santa Maria/RS, with 43 women, 20 with symptoms of UI and 23 without UI. We investigated risk factors such as socioeconomic profile, type of delivery, nutritional status and eating habits, as well as quality of life. **Results**: Socioeconomic data were not statistically different in both groups. We observed a significant association of multiparity and vaginal delivery with UI. The quality of life of the incontinent participants was lower in comparison to the continent women. We analyzed the impact of incontinence symptoms and classified them as mild and severe. We observed that caffeine consumption was not statistically different in women with mild or severe incontinence. Women with severe symptoms consume more citrus fruits, but this did not influence the worsening of symptoms. Also, we observed that incontinent women have a lower water consumption than the continents. **Conclusion:** The ingestion of caffeinated and citrus foods is not associated with the severity of the disease. UI can influence quality of life, so we suggest that incontinent women maintain good eating and adequate water consumption habits in order to have a better quality of life.

Keywords: Multiparity, eating habits, chronic diseases, vitamin C, quality of life.

RESUMO

Introdução: *A incontinência urinária (IU) caracteriza-se pela perda de urina involuntária e afeta consideravelmente a qualidade de vida das mulheres. O consumo de frutas cítricas e de cafeína podem*

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piorar os sintomas de incontinência. O objetivo foi determinar fatores de risco associados a incontinência, avaliar a qualidade e vida, bem como verificar se a cafeína e a vitamina C pioram os sintomas de mulheres incontinentes. **Materiais e métodos:** *Estudo transversal realizado em unidade básica de saúde de Santa Maria/RS, com 43 mulheres, 20 com sintomas de IU e 23 sem IU. Investigamos fatores de risco como perfil socioeconômico, tipo de parto, estado nutricional e hábitos alimentares, bem como a qualidade de vida.* ***Resultados:*** *Os dados socioeconômicos não diferiram estatisticamente nos grupos. Observamos associação significativa da multiparidade e parto vaginal com a IU. A qualidade de vida das participantes incontinentes foi mais baixa comparando às mulheres continentes. Analisamos o impacto dos sintomas da incontinência e classificamos em leve e grave. Evidenciamos que o consumo de cafeína não diferiu estatisticamente nas mulheres com incontinência leve ou grave. Mulheres com sintomas graves consomem mais frutas cítricas, mas esse resultado não influenciou na piora dos sintomas. Ainda, observamos que as mulheres incontinentes têm um consumo hídrico menor que as continentes.* ***Conclusão:*** *A ingestão de alimentos cafeinados e cítricos não está associada a gravidade da doença. A IU pode influenciar na qualidade de vida, assim sugerimos as mulheres incontinentes manter bons hábitos alimentares, consumo hídrico adequado, a fim de ter uma melhor qualidade de vida.*

Palavras-chaves: *Multiparidade, hábitos alimentares, doenças crônicas, vitamina C.*

INTRODUCTION

According to the International Continence Society (ICS), urinary incontinence (UI) is a storage symptom and is defined as the complaint of any involuntary loss of urine (ABRAMS *et al*., 2002). Incontinence is a stigmatized condition in many populations, which creates a high risk of bias in epidemiological interviews. Perhaps because of the stigma, incontinence is also associated with low rates of demand for care (ABRAMS *et al*., 2013). UI causes changes in the various dimensions of the lives of women, either because of the physiological limitations imposed by the disease or because of psychological confrontation with social and family inhibition, affecting their quality of life (QOL) (FERNANDES *et al*., 2015).

The systematic review of Inamura *et al.* (2015) mentions that diet and lifestyle currently have a significant impact on UI being more evident than some factors already identified as parity, smoking, vaginal delivery, among others and in general, nutritional and metabolic mechanisms interfere in all the systems of the body, including the urinary tract.

It is known that fluid consumption has a significant impact on symptoms of the lower urinary tract and lately studies have questioned whether the amount ingested, caffeine-based beverages, as well as acidic foods, worsen symptoms of UI (ROBINSON; GIARENIS; CARDOZO, 2014). In one study it was proven that decreased fluid intake improved the symptoms of urgency, frequency and urge incontinence, and increased fluid worsened symptoms (SWITHINBANK; HASHIM; ABRAMS, 2005).

Some risk factors for incontinence are already well established in the literature, such as parity, type of delivery, overweight and obesity (HIGA; LOPES; REIS, 2008). However, there are still few

studies prioritizing the investigation of the diet and the consumption or restriction of liquids, so that, in a more concise way, limits and guidelines are established. Thus, this study aimed to determine risk factors associated with incontinence, assess quality and life, as well as verify whether caffeine and ascorbic acid worsen the symptoms of incontinent women.

MATERIALS AND METHODS

The study was approved by the Research Ethics Committee of the Franciscan University in March 21, 2017 (No. 1,975,570) and free and informed consent was obtained from all participants. A prospective cross-sectional study was carried out in two Basic Health Units (BHU) in the western region of Santa Maria, Rio Grande do Sul, Brazil, from April to November 2017.

Population of the study

Women between the ages of 40 and 65 years old with and without symptoms of urinary incontinence were invited to participate in the study. The age range of the participants selected is considered climacteric and according to the Ministry of Health is where a decline in ovarian hormonal function leads to significant changes in internal and external genitalia such as menopause, genital hypotrophy, and estrogen deficiency predisposing women to develop UI (BRASIL, 2008). Women outside the age group, who had neurological pathologies, previous pelvic surgery, who were nulligans, pregnant, or unable to stand for nutritional assessment and who refused to participate in all stages of the study were excluded.

Data collection

Self-reported questionnaires were used for data collection. In order to identify the groups and to determine the severity of the UI, the "International Consultation on Incontinence Questionnaire - Short Form" (ICIQ-SF) validated for Portuguese was used, which is composed of four questions that assess the frequency, severity and impact of UI, in addition to a set of eight self-diagnostic items related to the causes or situations of UI experienced by the participants, in which we can identify the type of UI, stress UI, urgency UI and mixed UI (TAMANINI *et al.*, 2004).

Women with and without symptoms of UI were identified with the ICIQ-SF and the impact of UI severity on the quality of life was graded by summing the three questions, obtaining a score. For the analysis of the results, a classification score was used, where: 1 to 6 was considered a light impact and 7 points or more a serious impact.

Anthropometric data, sociodemographic profile, water intake, as well as other risk factors of UI were analyzed by means of an evaluation form. In the anthropometric evaluation, weight and height

were measured to calculate the Body Mass Index (BMI), by dividing the weight (kg) by height (m^2), and the result expressed in kg/m^2. The result of this calculation was in accordance with the classification proposed by the World Health Organization (WHO) (1997) for adults, and according to Lipschitz (1994) for elderly individuals. The weight was determined using a Sulfitness® analog scale, with a capacity of 150 kg and a precision of 100g. Waist circumference (WC) was measured at midpoint, according to the WHO (2000) and classified according to National Institutes of Health (NIH) (2000).

A semiquantitative food frequency questionnaire was used to evaluate the consumption of foods and liquids that may be irritating to the bladder. Consumption of citrus fruits was divided into "no-consumption", "average consumption (1 to 4 times a week)", "high consumption (more than 5 times a week)" and consumption of chocolate, soda, coffee and *chimarrão* (drink typical of Rio Grande do Sul) was divided into "consumes" and "does not consume" only.

To identify the quality of life of the participants with and without UI, the Medical Outcomes Study 36 - Item Short - Form Health Survey (SF-36) validated for Portuguese was used. A multidimensional questionnaire, consisting of 8 domains: functional capacity, physical aspects, pain, general health, vitality, social aspects, emotional aspects and mental health, presenting a final score of 0 to 100, in which zero corresponds to the worst general state of health and 100 the best general state of health (CICONELLI, 1999).

The blood biochemical analyses of glucose, total cholesterol, HDL-cholesterol (HDL-c, LDL--cholesterol (LDL-c), triglycerides and urine pH were carried out by the school laboratory of clinical analyses (LEAC) of the Biomedicine course of the Franciscan University and the participants had been fasting for 12 hours. HDL-c, total cholesterol (TC), triglycerides (TG) and Glucose were determined by the Labtest Diagnostica® kit. LDL-c was determined by the Friedewald formula: C LDL= C Plasma - C HDL - TG/5. The pH of the urine was determined by urine tapes - Uriquest plus I - Labtest Diagnostica®.

The determination of serum ascorbic acid was performed according to Jaques-Silva *et al.* (2001). Plasma was precipitated with trichloroacetic acid (10%) in the ratio of 1.5/1 and centrifuged for 15 minutes at 3000 rpm. The supernatant was mixed with the dinitrophenylhydrazine (DNPH), then it was incubated for 3 hours at 37ºC. Then 100µl of H2SO4 (65%) was added to stop the reaction. The ascorbic acid content was calculated using the curve of (1.5-9) mol/l of ascorbic acid and expressed as µg of ascorbic acid/mL plasma.

Statistical analysis

Data analysis was performed using the software IBM SPSS Version 23. The statistical analyses regarding the characterization of the group of women with and without UI, of the SF-36 domains and metabolic profile, besides the consumption of liquids and foods in relation to the UI impact classification, involved: descriptive analyses; Shapiro-Wilk test for the verification of normality of

the continuous variables; t test for independent data and Mann-Whitney depending on the result of normality; chi-square and Fisher's exact test. Differences were considered significant when the results presented p-value <0.05.

RESULTS

After the sampling process were select 52 women and 9 women, were excluded from the study, because they didn't complete all the steps of the evaluation.Thus, 43 women were part of the study, 46.5% (n = 20) with symptoms of UI (with UI) and 53.5% (n=23) without symptoms of UI (without UI). Out of the sample with UI, 25% (n=5) had symptoms of stress urinary incontinence (SUI), 20% (n=4) had symptoms of urge urinary incontinence (UUI) and 55% (n=11) of mixed urinary incontinence (MUI).

The mean age of the participants was: with UI 54.6 ± 6.8 years and without UI 52 ± 8.2 years. Table 1 shows the characteristics of participants with and without UI, where we can observe that there are no significant differences between schooling, skin color, marital status, individual or family income between the groups. Regarding the type of delivery, it can be observed that vaginal delivery predominated in women with UI in relation to women without UI, which confirms the association of vaginal delivery with a higher risk of developing UI (p=0.029) when compared to cesarean delivery (p=0.494). In addition, there is also a relation with the number of children, being multiparity more associated with the presence of UI (p=0.006). Although BMI, WC, smoking, alcoholism and physical activity are risk factors for incontinence, in our study they did not present statistical differences between the group of women without UI and the group of women with UI.

Table 1 - Sociodemographic characteristics of women with and without urinary incontinence (UI).

	Symptoms				p-Value
	With UI (SD) (n= 20)	**%**	**Without IU (SD) (n=23)**	**%**	
Age	54,6 (6,8)	-	52 (8,2)	-	-
BMI	31,9 (6,9)	-	30,4 (6)	-	p= 0,445 [c]
WC	95,3 (13,3)	-	96,4 (15,9)	-	p=0,806 [c]
Weight	76,8 (16,5)	-	76,9 (16,5)	-	p= 0,992 [c]
Skin color					
White	10	50%	16	69,6%	p=0,191 [a]
Not white	10	50%	7	30,4%	
Schooling					
Illiterate	1	5%	0	0	p=0,465 [b]
Literate	19	95%	23	100%	
Marital Status					
Single	7	35%	3	13%	
Married	10	50%	13	56,5%	p=0,183 [a]
Widow/Separated	3	15%	7	30,5%	

Individual income (minimum salaries)	0,98	-	1,46	-	p=0,152 [c]
Family income (minimum salaries)	2,47	-	2,76	-	p=0,849 [c]
Smoking					
Yes	4	20%	3	13%	p=0,687 [b]
No	16	80%	20	87%	
Alcoholism					
Yes	4	20%	5	21,7%	p=1 [b]
No	16	80%	18	78,3%	
Physical activity					
Yes	7	35%	9	39,1%	p=0,780 [a]
No	13	65%	14	60,9%	
Vaginal delivery					
Yes	16	80%	11	47,8%	p=0,029 [a] *
No	4	20%	12	52,2%	
Cesarean delivery					
Yes	11	55%	15	65,2%	p=0,494 [a]
No	9	45%	8	34,8%	
No of children	3,2 (1,2)	-	2 (1,2)	-	p=0,006 [c] *

[a] Chi-square of Pearson [b] Fisher exact test [c] Mann-Whitney SD= Standard Deviation BMI= Body Mass Index *UI= Urinary Incontinence * = Significance of p <0,05 WC= Waist Circumference*

In Table 2 regarding quality of life, according to the SF-36 questionnaire, it can be observed that UI compromises the mental health of these women (p = 0.036) when compared to women without UI. Although in the other domains we did not find significance, the total scores were lower in women with UI than in those without UI. According to the general score (sum of all domains), women with UI had a mean of (50.8 ± 21) and women without UI (61.7 ± 22.1), this difference was already expected due to the negative influence of incontinence symptoms in women, but it was not significant (p = 0.11).

Table 2 - Domains of the questionaire Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36).

	Mean	**SD**	**p-Value**
Functional Capacity			
With UI	59,5	26,1	p=0,380 [b]
Without UI	69,1	26,3	
Limitation for physical aspects			
With UI	35,0	42,4	p=0,412 [b]
Without UI	47,8	42,5	
Pain			
With UI	44,5	27,0	p=0,202 [a]
Without UI	55,6	28,7	
General State of Health			
With UI	46,7	20,4	p=0,143 [a]
Without UI	55,8	19,7	
Vitality			
With UI	55,5	25,8	p=0,252 [a]
Without UI	64,5	25,2	
Social Aspects			

With UI	67,6	29,0	p=0,380 [b]
Without UI	75,3	26,8	
Limitation by Emotional Aspects			
With UI	43,3	42,0	p=0,412 [b]
Without UI	56,5	45,4	
Mental Health			
With UI	54,8	22,8	p=0,036 [a*]
Without UI	68,6	19,2	

α t *Test independent samples b Mann-Whitney * = Significance of p <0,05 SD= Standard Deviation*

We observed the metabolic profile of the participants with and without UI where HDL-c, LDL-c, TC, TG and glycemia were analyzed. The mean of the metabolic profile of women with and without UI is within the reference parameters, with the exception of total cholesterol and glycemia that are slightly above the desirable values in women with UI (FALUDI *et al.*, 2017). When comparing the results between groups, we did not find significant differences, as shown in table 3. Regarding water intake, women without UI consume significantly more water (p=0.049), on average 1260 ± 650.6 ml/day compared to women with UI who consume on average 892 ± 531.7 ml/day.

Table 3 - Metabolic profile of the participants.

Metabolic profile (mg/dL)	With UI (n= 20)	Without UI (n=22)	p	Reference Values
HDL-c	45,5 ± 15,1	42,8 ± 10,4	p=0,513 [α]	> 40
LDL-c	119,1 ± 43,8	113,7 ± 30,5	p=0,642 [α]	< 130
Total Colesterol	192,1 ± 48,2	180,4 ± 31,6	p=0,659 [b]	< 190
Triglycerides	136,40 ± 69,7	118 ± 63,3	p=0,378 [b]	< 150
Glycemia	103,9 ± 53,2	84 ± 13,4	p=0,650 [b]	< 100

α t *Test independent samples b Teste de Mann-Whitney HDL-c= High density lipoprotein LDL-c= Low density lipoprotein SD= Standard Deviation*

Regarding the severity of the symptoms of women with UI, the impact of incontinence was analyzed. 40% had a mild impact (n = 8) and 60% had a severe impact (n = 12). Then it was verified whether caffeine and citrus fruits, rich in ascorbic acid could influence the worsening of symptoms in women with UI. In relation to beverages such as coffee, soda and chimarrão which is considered a typical drink, as well as chocolate, we did not find any significance when comparing with the impact of urinary incontinence, as shown in Table 4.

Table 4 - Consumption of liquids and bladder irritant foods.

	Classification of Impact of UI				p-Value
	Mild Impact (n=8)	%	Severe Impact (n= 12)	%	
Chocolate					
Consumes	6	75%	10	83,3%	p=1[a]
Does not consume	2	25%	2	16,7%	
Coffee					

Consumes	8	100%	11	91,6%	p=1 [a]
Does not consume	0	0%	1	8,4%	
Chimarrão					
Consumes	8	100%	10	83,3%	p=0,495 [a]
Does not consume	0	0%	2	16,7%	
Coca-Cola					
Consumes	5	62,5%	11	91,6%	p=0,255 [a]
Does not consume	3	37,5%	1	8,4%	
Guaraná Antártica					
Consumes	3	37,5%	10	83,3%	p=0,062 [a]
Does not consume	5	62,5%	2	16,7%	

a Fisher exact test

We analyzed the frequency of citrus fruit consumption in women with incontinence and found that women with severe impact consume more citrus fruits compared to women with mild impact, as shown in table 5. However, this result does not seem to be responsible for the symptoms of severity of UI, because when we analyzed the urine pH it was possible to observe that women with a mild impact had a mean pH of 5.1 ± 0.5 and women with a severe impact (5.3 ± 0.5) and there was no significant difference when comparing these two classifications (p=0.571). In addition, when analyzing the serum level of ascorbic acid, we also did not find a significant difference in relation to the 2 impact classifications (p=0.990): mild (5.5 ± 2 mg/dL) and severe (5.5 ± 2.5 mg/dL).

Table 5 - Consumption of citrus fruits of incontinent women.

Fruit	Classification of impact of UI (n=20)									
	Mild (n=8)					Severe (n=12)				
	Does not consume n (%)	1-2x n (%)	3-4x n (%)	5-6x n (%)	Daily n (%)	Does not consume n (%)	1-2x n (%)	3-4x n (%)	5-6x n (%)	Daily n (%)
Pineapple	7(35%)	1(5%)	-	-	-	11(55%)	1(5%)	-	-	-
Banana	1(5%)	1(5%)	-	1(5%)	5(25%)	2(10%)	3(15%)	3(15%)	1(5%)	3(15%)
Tangerine	6(30%)	1(5%)	-	-	1(5%)	9(45%)	-	2(10%)	1(5%)	-
Guava	8(40%)	-	-	-	-	11(55%)	-	1(5%)	-	-
Orange	4(20%)	2(10%)	1(5%)	-	1(5%)	4(20%)	3(15%)	2(10%)	1(5%)	2(10%)
Lemon	5(25%)	-	-	-	3(15%)	7(35%)	1(5%)	1(5%)	1(5%)	2(10%)
Apple	2(10%)	1(5%)	3(15%)	-	2(10%)	5(25%)	2(10%)	2(10%)	1(5%)	2(10%)
Papaya	5(25%)	1(5%)	1(5%)	-	1(5%)	9(45%)	1(5%)	1(5%)	-	1(5%)
Mango	6(30%)	2(10%)	-	-	-	7(35%)	2(10%)	2(10%)	1(5%)	-
Maracuya	8(40%)	-	-	-	-	11(55%)	1(5%)	-	-	-
Watermelon	8(40%)	-	-	-	-	10(50%)	2(10%)	-	-	-
Melon	7(35%)	1(5%)	-	-	-	10(50%)	2(10%)	-	-	-
Strawberry	7(35%)	1(5%)	-	-	-	11(55%)	1(5%)	-	-	-
Pear	8(40%)	-	-	-	-	9(45%)	3(15%)	-	-	-
Grape	7(35%)	1(5%)	-	-	-	10(50%)	2(10%)	-	-	-

DISCUSSION

This study aimed to establish the risk factors associated with incontinence, assess QOL, as well as verify whether caffeine and ascorbic acid worsen the symptoms of incontinent women. Risk factors mentioned in the literature, such as smoking, schooling, skin color, BMI and weight, had no association with incontinence in the present study. The significant differences between the participants with and without UI appeared for multiparity and vaginal delivery, which corroborates with the study by Oriá *et al.* (2018) in which they evidenced that nocturia and incontinence are the most prevalent storage symptoms in older women, women with higher BMI, higher number of pregnancies and vaginal deliveries.

Incontinence usually contributes to the appearance of psychological, social, sexual, as well as physical and economic changes, negatively influencing QoL. In our study, from the analysis of the SF-36 questionnaire, mean scores differed in all domains among women with and without UI; however, the mental health domain was the only one that was significant. This domain takes into account questions about how long the person has been feeling nervous, depressed, calm, discouraged or happy and the low score achieved may be related to some negative situations caused by incontinence such as: fear of losing urine publicly, being smelling of urine, problems related to sleep due to nocturia and even repercussions on their sexuality.

In the study by Leroy and Lopes (2012), puerperal women with and without UI were evaluated, and multiparity was significant in incontinent women. They also investigated QOL interference in these women, and found a low score in both groups in almost all domains, which corroborates our study, in which both groups presented low scores. Still, Padilha *et al.* (2018) found that vaginal delivery and multiparity are strong predictors of UI and that incontinence causes negative aspects in the QOL of these women. We also observed that all domains had low scores in incontinent women, this highlights the importance for health professionals to act more closely with the symptoms of incontinence and to show that episodes of urine loss should not be underestimated, encouraging these women to seek treatment in order to improve their health and well-being.

Although BMI was not significant in the association with UI, the mean of both groups was high, being considered obesity by WHO (1997). Studies indicate that obesity is a major risk factor for developing incontinence because overweight is believed to increase abdominal pressure during daily activities and may increase bladder pressure and cause increased mobility of the urethra and bladder neck (ARDILA, 2015). Even though obesity was considered a risk factor for SUI, we observed that in both groups the participants were obese according to the BMI.

Overweight and obesity are often associated with the imbalance of total cholesterol, HDL-c, LDL-c, triglycerides, among others. We analyzed the metabolic profile of the participants by means of the serum analysis of total cholesterol, HDL-c, LDL-c, triglycerides and glycemia, and although

they were not significant, incontinent women presented total cholesterol and glucose levels above the reference values of The Brazilian Guidelines on Dyslipidemias and Prevention of Atherosclerosis and associated with sedentarism, BMI and WC also high, there is a great risk of them developing metabolic syndrome or cardiovascular disease.

These results are in agreement with the study by Boudokhane *et al.* (2013) who claim that some cardiovascular risk factors such as obesity, dyslipidemia, hyperinsulinemia and diabetes are associated with a high risk of developing lower-tract symptoms such as UI and overactive bladder. In their study with participants of both genders, they analyzed fasting and postprandial glycemia, glycosylated hemoglobin, HDL-c, LDL-c, triglycerides, total cholesterol and concluded that overactive bladder was significantly correlated with age, WC, BMI and postprandial glycemia.

It is now known that in order to avoid chronic diseases, people should maintain healthy lifestyle, being disciplined regarding food and physical activity. An aspect of great importance is the water intake. In our study, we observed that women with incontinence consume much less water compared to women without incontinence, however, both groups consume little water daily. This low water intake may possibly be associated with the fear that incontinent women have of drinking too much water thus increasing the frequency of urination. According to Dietary reference intakes (DRI) (2004) water intake is recommended to avoid deleterious effects of dehydration, which include metabolic and functional abnormalities, so the recommended intake is 2.2 L and 3 L, respectively, for adult women and men.

Restriction of fluids was evident in a study in which 24 adult participants were instructed to increase or decrease their fluid intake. The authors observed a significant reduction in the frequency, urgency and nocturia of those who reduced fluid intake by 25%, while those who increased the amount of fluid by 25% and 50%, showed a worse daytime urinary frequency (HASHIM; ABRAMS, 2008). Another study investigated the total amount of fluid ingested by women and concluded that women without UI should not be concerned about restricting their fluid intake for fear of developing UI (TOWNSEND *et al.*, 2011). Therefore, knowing the benefits of water consumption, we recommend that incontinent women increase water intake and decrease the consumption of carbonated, sugary and alcoholic drinks, in order to reduce the probability of developing obesity and not for fear of worsening the symptoms of incontinence.

Other widely consumed liquids are those containing caffeine, being considered the most ingested worldwide and also the most questioned in the association with UI. Caffeine is considered a stimulant and because it has a diuretic effect, it is strongly associated with incontinence, as it can also influence the increase in pressure in the bladder and promote the excitability of the detrusor muscle. In our analyses, the consumption of coffee, chimarrão and soda as well as chocolate was not significant in association with urinary incontinence, as in the study by Townsend, Resnick, Grodstein (2012) there was no association between increased and decreased caffeine intake with the long-term worsening of UI. In contrast, Jura *et al.* (2011) investigated the frequency and amount of consumption

of tea, coffee, soda and chocolate and the results showed a significant tendency to increase the risk of UUI with the intake of high doses of caffeine (450 mg/day), since caffeine has a diuretic factor and can cause detrusor overactivity, increasing the likelihood of involuntary urinary incontinence.

Therefore, only when abundantly consumed, that is, above 450 mg/day, the consumption of liquids and caffeinated foods can represent a predisposition to increased urinary loss. In our study we investigated whether or not the participants consumed caffeinated foods and beverages. We observed that most incontinent women consumed these foods but found no relation to worsening in symptoms.

Some studies question whether ascorbic acid exacerbates the symptoms of incontinence. In the present study we identified that women with severe symptoms of UI consume more citrus fruits compared to women with mild symptoms, however, blood levels of ascorbic acid and urine pH did not differ statistically, parameters that could be increased in participants who consumed more citrus fruits. Thus, it can be concluded that the consumption of foods with more ascorbic acid does not contribute to worsening of symptoms of women with UI. On the contrary, ascorbic acid is an important antioxidant in fruits and vegetables that contributes to the reduction of reactive oxygen species (ROS), helping to reduce cell oxidative stress (VANNUCCHI; ROCA, 2012) Ascorbic acid levels were due only to food because none of the participants used supplementation.

The results of the studies agree, the only way to Townsend *et al.* (2013) who compared two cohorts and investigated the association of UI with citric fruit intake, with tomato and orange juice being the most consumed, however, no results confirming this association were observed. Similarly, citric fruit intake was not related to the risk of symptom progression among women who had already been diagnosed with incontinence. However, in the study by Maserejian *et al*. (2011) ascorbic acid intake was investigated and women who consumed high doses of ascorbic acid (> 250 mg/day) through diet and/or supplements reported a greater likelihood of storage symptoms, particularly frequency and urgency. This may have been due to high doses of ascorbic acid, which are excreted in the urine, leaving the pH more acidic and thus increasing urination, which did not occur in our study. The main limitation of this study was the low participants number, as some completed the assessment stage and who did not collect blood and urine tests.

CONCLUSION

It was possible to observe that some risk factors such as parity and vaginal delivery directly predispose the development of urinary incontinence. In our study we did not find results associating BMI and weight with UI, however, it is already well understood in the literature that these measures, when higher than recommended, also predispose the appearance of symptoms of incontinence as well as chronic diseases. Regarding the consumption of caffeinated beverages and citrus fruits, we did not identify an association with worsening of symptoms, which makes them of great importance

to propose a dietary recommendation of incontinent people. Therefore, we suggest that people with incontinence opt for a balanced diet, with a higher consumption of fruits and vegetables, prioritizing foods in natura and avoiding ultraprocessed food, high in sugar and low quality fat, and that they try to exercise daily, have good habits in order to avoid chronic diseases and have a better quality of life.

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APÊNDICE - Ficha de Avalição

Nome:_____

Idade:_____ Data de Nascimento:_____

Telefone:_____

1- Cor da Pele que você se considera: 1 ▢ Branco 2 ▢ Não Branco 3 ▢ Negro 4 ▢ Pardo

2- Grau de escolaridade: 1 ▢ Analfabeto 2 ▢ Ensino Fundamental 3 ▢ Ensino Médio
4 ▢ Graduação 5 ▢ Pós-graduação

3- Renda mensal individual:_____ (em salários mínimos)

4- Renda mensal familiar:_____(em salários mínimos)

5- Estado civil: 1 ▢ Solteiro 2 ▢ Casado 3 ▢ Viúvo 4 ▢ Separado

6- Filhos? 0 Não possui filhos 1 ▢ 2 ▢ 3 ▢ 4 ▢ 5 ▢ 5 filhos ou mais ▢

7- Idade que menstruou pela primeira vez:_____

8- Tipo de parto: 1 ▢ Vaginal/ Quantos?_____ 2 ▢ Cesárea/Quantas?_____

9- Postura do parto vaginal: 1 ▢ Cócoras 2 ▢ Deitada 3 ▢ Sentada

10- Cirurgias prévias:_____Quanto tempo:_____

11- Idade que iniciou a menopausa?____ _____

12- Tem doenças respiratórias: 1 ▢ DPOC 2 ▢ Asma 3 ▢ Outras _____

13- Pratica atividade física: 1 ▢ SIM 2 ▢ NÃO

Qual atividade: 1 ▢ Caminhada 2 ▢ Musculação 3 ▢ Outras:_____

Quantas vezes por semana: 1 ▢ 1-2 2 ▢ 3-4 3 ▢ Todos os dias

14- Constipação intestinal: 1 ▢ SIM 2 ▢ NÃO

15- Patologias: 1 ▢ Diabetes 2 ▢ Hipertensão 3 ▢ Hipotireoidismo 4 ▢ Hipertireoidismo
5 ▢ Outras:_____
Qual medicação e posologia:_____

16- Ingestão hídrica (litros/ dia):_____

17- Tabagismo: 1 ▢ SIM 2 ▢ NÃO Quantos cigarros por dia? _____
Com que idade começou a fumar? _____
3 ▢ Ex-fumante. Quanto tempo de abandono? _____

18- Você costuma ingerir bebidas alcoólicas? 1 ▢ SIM 2 ▢ NÃO, Com que frequência? ▢ 1 a 2 dias/ semana ▢ 3 a 4 dias/semana ▢ 5 a 6 dias/semana ▢ Todos os dias (inclusive sábado e domingo) ▢ Menos de 1 dia/semana ▢ Menos de 1 dia/mês 2 ▢ Ex-etilista. Quanto tempo de abandono? _____

19- Tem diagnóstico médico de incontinência urinária: 1 ▢ SIM 2 ▢ NÃO

20- Faz uso de absorvente: 1 SIM 2 NÃO Quantos por dia_____

21- Faz suplementação de vitamina C: 1 ▢ SIM 2 ▢ NÃO Qual medicação:_____
Quantas vezes ao dia?_____ Quanto tempo?_____

Peso:_____
Altura:_____
IMC: _____
Classificação:_____
Circunferência da Cintura:_____