

Urinary dysfunction in women practicing physical activity in academies – a cross-sectional study

Disfunções urinárias em mulheres praticantes de atividade física em academias – um estudo transversal

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RESUMO | INTRODUÇÃO: Segundo a *International Continence Society* (ICS), a Incontinência Urinária de Esforço (IUE) é a mais comum causa de perda involuntária de urina que tem como fator de risco, a prática de atividade física e esportiva em mulheres. **OBJETIVO:** Verificar a prevalência de IUE em mulheres com prática regular de atividade física em academias. **METODOLOGIA:** Estudo transversal, realizado em duas academias particulares da cidade de Belém do Pará, em mulheres praticantes de atividade física regular, com idade entre 25 e 55 anos; foram excluídas mulheres com alteração cognitiva, portadoras de diabetes e com problemas neurológicos. Foram aplicados um questionário padrão e o *Protection, Amount, Frequency, Adjustment and Body image* (PRAFAB). As variáveis foram analisadas pelos testes Exato de Fisher e Mann-Whitney ($p < 0,05$). CAAE 61681416.4.0000.5173. **RESULTADOS:** A amostra foi composta por 56 mulheres, das quais 7 (12%) relataram perda recente de urina. As incontinentes eram praticantes de musculação (100%) e a maioria (71%) associava esta prática com exercícios aeróbicos. As ocorrências foram relatadas em média de 5 vezes por semana (85%) e durante os exercícios (57%). Não houve diferença estatística na comparação das variáveis entre continentes e incontinentes ($p > 0,05$). **CONCLUSÃO:** A prevalência de IU em mulheres praticantes de exercícios aeróbicos e musculação nas academias foi baixa (12%), com severidade de moderada a grave e sem associação com idade, modalidade, tempo de prática, turno e frequência de exercícios.

PALAVRAS-CHAVE: Incontinência urinária. Atividade física. Assoalho pélvico.

ABSTRACT | INTRODUCTION: According to the *International Continence Society* (ICS), the Urinary Incontinence of Effort (UIE) is the most common cause of involuntary loss of urine, which has as a risk factor the practice of physical and sports activity in women. **OBJECTIVE:** To verify the prevalence of UIE in women with regular practice of physical activity in academies. **METHODOLOGY:** A cross-sectional study, carried out in two private academies in the city of Belém do Pará, in women practicing regular physical activity, aged between 25 and 55 years; women with cognitive impairment, diabetes mellitus, and neurological problems were excluded. A standard questionnaire and the *Protection, Amount, Frequency, Adjustment and Body image* (PRAFAB) were applied. The variables were analyzed by Fisher's Exact and Mann-Whitney tests ($p < 0.05$). CAAE 61681416.4.0000.5173. **RESULTS:** The sample consisted of 56 women, of whom 7 (12%) reported recent loss of urine. The incontinent women were bodybuilders (100%) and the majority (71%) associated this practice with aerobic exercises. The occurrences were reported on average 5 times per week (85%) and during the exercises (57%). There was no statistical difference in the comparison of the variables between continents and incontinent women ($p > 0.05$). **CONCLUSION:** The prevalence of UI in women who performed aerobic exercises and bodybuilding in gymnasiums was low (12%), with moderate to severe severity and no association with age, modality, practical time, shift and exercise frequency.

KEYWORDS: Urinary incontinence. Physical activity. Pelvic floor.

Introduction

The International Continence Society (ICS) states that urinary incontinence (UI) is any involuntary loss of urine¹ consisting of a pathology that results in a number of effects on daily activities such as social interaction and perception of one's health, especially related to social and mental well-being, covering problems in sexual life, social embarrassment, low self-esteem, and depression, and possibly leading to the abandonment of sports practices due to urinary incontinence².

UI is a growing problem that affects 200 million people of all ages, the majority of them women. However, it is known that a quarter of women between 15 and 64 years of age have already had an episode of UI, and of those only one-quarter have sought a medical service regarding the loss of urine³.

UI can be characterized according to the event leading to urine loss, and thus classified into three types: stress urinary incontinence (SUI), which is considered urinary loss through exertion, exercise, coughing or sneezing; urgency urinary incontinence (UUI), leading to involuntary loss of urine accompanied by a sudden and uncontrollable urge to urinate, difficult to delay; and mixed UI which consists of signs and symptoms of the two types already mentioned⁴.

Nowadays, the practice of physical exercise in gyms is becoming an increasingly frequent habit among women⁵. It is known that the regular practice of aerobic physical exercises, muscle strengthening, and flexibility promote benefits in the prevention and treatment of several pathologies, such as heart disease, systemic arterial hypertension, obesity, and osteoporosis, among others. Exercise also influences emotional aspects, providing psychological well-being and reducing symptoms such as anxiety, stress, and depression⁶.

Although the benefits to women's quality of life are proven, the excessive practice of physical activities may be a risk factor for the development of UI^{7,8}. The most common type of incontinence in women aged 20-40 years is SUI, since high-impact exercises that require intense exertion increase intra-abdominal pressure and can overload the pelvic organs, thus

causing severe damage to the muscles of the pelvic floor³.

Regarding this subject, the lack of information about the importance of contraction of the perineal muscles during physical exercise is noteworthy, since the prevalence of UI in elite athletes can reach 80%⁹ and in women with a mean age of 15 to 64 years old who practice simpler activities can vary from 10 to 55%¹⁰. Thus, several urinary and sexual dysfunctions can arise from the inadequate or non contraction of this musculature.

Although studies have been performed that point to the risk of UI in physical activity practitioners, especially athletes, it is still not clear whether women who practice exercise in gyms are at risk of developing UI. Thus, the objective of this study was to verify the prevalence of UI in women practicing physical activity in gyms in Belém do Pará.

Methodology

This is a cross-sectional study conducted at the Trainer and Evolution gyms located in the city of Belém do Pará, during the months of March and April 2017. The target group was women practicing physical activity in the gyms, who met the following eligibility criteria: inclusion criteria, aged between 25 and 55 years of age and residents of Belém, and exclusion criteria, women with cognitive impairment, diabetes mellitus, or neurological problems.

The volunteers who composed the sample were selected for convenience; individually addressed during physical activity and invited to participate in the study. After acceptance, the participants were submitted to an evaluation composed of: anamnesis, in which personal data were collected, and questions related to the type, time, shift, and frequency of physical activity performed. Next, the participants answered questions about UI symptoms: whether there was a loss of urine and at what point such loss occurred, how it progressed, whether there were associated factors, and lastly whether this problem affected their sexual life.

If the response was positive for the presence of UI, the volunteer answered the questionnaire Protection,

Amount, Frequency, Adjustment, Body image (PRAFAB), a non-validated instrument, translated into Portuguese, with the objective of quantifying the severity of UI. The questionnaire contains 5 domains, protection, frequency, quantity, adaptations, and self-image. The score of each domain ranges from 1

to 4, with the total score varying from 5 to 20. The UI is classified as follows; scores of 4 to 6 represent mild UI, 7 to 10 moderate, and 11 to 20 severe¹¹.

The first domain “protection” corresponds to the pad test as described in Table 1.

Table 1. Severity of SUI, according to classification of the 1st PRAFAB question, for group G1 (n = 7) . Belém, Pará, November, 2017.

SEVERITY	SCORE	PAD TEST 48 HOURS	USE OF PROTECTORS
Mild	1	<20 g	Do not use
Moderate	2	20-100 g	Occasionally
Severe	3	100-200 g	Constant except when resting/sleeping
Very severe	4	>200 g	Day and night

Source: field research, 2017

For the sample calculation, we considered the population of the academy Trainer (A1) that has 270 women enrolled, of which 159 will be investigated, being divided into 53 per shift, and the academy Evolution (A2), with 200 women enrolled, of which 132 will be investigated, being divided into 44 per shift. To obtain this result, the online calculator was used to define the necessary sample, since this study uses simple random sampling for categorical variables. The confidence interval (CI) adopted was 95%, with a margin of error of 5%.

For better presentation of the results, the participants were divided into two groups G1 and G2, G1 being the group of women who stated that they had some

type of urinary dysfunction and G2 the women who denied any problem. The G test, Fisher's exact test, and the Mann-Whitney test were used to compare the two groups in relation to the type of physical activity reported by the interviewed women, according to the characteristics of the variables. A significance level of 5% was used and statistical analyzes were performed in the Bioestat 5.3 program.

Results

Fifty-six women participated in the study, of which only 12% reported the loss of urine (Figure 1).

Figure 1. Prevalence of urine loss in the sample group (n = 56 G1 and G2). Belém, Pará, November 2017.

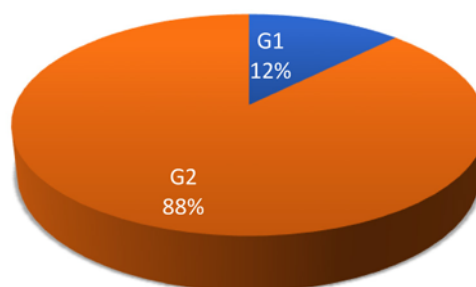


Table 2 present the variables age, number of activities that each participant performs in the gym, whether they perform physical activities outside the gym and at weekends, and the training time and number of times in the week that they practice physical activity.

Table 2. Distribution of the frequency of variables age and characteristics of the activities performed in the gym of groups G1 and G2. Belém, Pará, November, 2017.

Variables	G1 (n=7)	%	G2 (n=49)	%	p-value
Age					
Mean	45.9		36.3		0.0614*
Standard deviation	14.3		8.2		
No. of activities in the gym					0.3603**
1	2	28.6	20	40.8	
2	1	14.3	15	30.6	
> 3	4	57.1	14	28.6	
Activities outside the gym					0.6116***
Yes	2	28.6	9	18.4	
No	5	71.4	40	81.6	
Activities at the WE ¹					1.000***
Yes	6	85.7	41	83.7	
No	1	14.3	8	16.3	
Activity time					0.6378*
Mean	77.1		29.3		
Standard deviation	89.8		44.1		
No. of times/week					0.5771**
1 to 3 times	1	14.3	10	20.4	
5 times	6	85.7	35	71.4	
7 times	0	0.0	4	8.2	
Shift					0.8270**
Morning	2	28.6	18	36.7	
Afternoon	2	28.6	16	32.7	
Night	3	42.9	15	30.6	

¹Weekend

Table 3 describes the activities performed within the gyms, in which it is possible to observe that the majority of the participants practiced bodybuilding, an activity that is currently very popular with many women seeking a better quality of life and improved self-esteem.

Table 3. Activities carried out by groups G1 and G2. Belém, Pará, November 2017.

Activity	G1	%	G2	%
Bodybuilding	7	100.0	48	98.0
Aerobics	5	71.4	26	53.1
Rhythm	3	42.9	10	20.4
Jump	2	28.6	6	12.2
Kango Jump	0	0.0	1	2.0
Pilates	0	0.0	4	8.2

Table 4 describes the physiotherapy evaluation questionnaire on urinary function which was only given to women who reported the loss of urine. Of the 7 women who completed the questionnaire, the loss situations were as follows; 2 while exercising, 2 coughing, 1 sneezing, and 2 in situations not presented in the questionnaire. All the women were aware when they lost and with a frequency of once a day; 4 in the morning, 2 in the evening, and 1 in the afternoon.

Table 4. Characteristics of the loss of urine of the G1 group (n = 7) . Belém, Pará, November 2017.

Loss situation	Prevalence of loss	Quantity of loss	Feels the loss	Frequency of loss	Time of loss
Exercising	2	Drops	Yes	Once a day	Night
Other	2	Drops	Yes	Once a day	Morning
Coughing	1	Drops	Yes	Once a day	Morning
Sneezing	1	Drops	Yes	Once a day	Morning
Coughing	1	Drops	Yes	Once a day	Afternoon

Table 5 describes the scores obtained in the PRAFAB questionnaire, answered by the participants with urinary loss. In the protective domain, 5 women responded that they never wore protection (diaper/sanitary pad) against UI and two said they sometimes wore protectors, or needed to change their underwear due to the UI. In the domain quantity of loss, all responded that they lost a few drops of urine or less, and in the frequency domain, 6 stated that the loss occurred once a week or less and one reported between one and three times a week. All participants stated that the loss does not detract from their daily activities, and in the domain of body image, 4 answered that UI does not inconvenience them and 3 stated that UI is annoying and disruptive, but they do not feel too uncomfortable about it.

Table 5. Frequency of scores obtained through the PRAFAB (G1 = 7). Belém, Pará, November 2017.

Domain	Number of volunteers	Score
Protection	5	1
	2	2
Quantity of urine loss	7	1
Frequency of urine loss	6	1
	1	2
Adjustment	7	1
Body Image	4	1
	3	2
Total score	2	5
	4	6
	1	7

Discussion

The present study aimed to verify the prevalence of UI in women who practice physical activity in gyms in the city of Belém do Pará. It was observed that the prevalence of UI was low; however, physical activity is a risk factor to acquire some type of urinary dysfunction⁶ due to the compromise of the mechanisms of support, suspension, and restraint of the pelvic floor muscles (PFMs), which are exposed to intense and repeated overloads, thus promoting their weakening¹². Some exercises increase the intra-abdominal pressure, causing a load on the PFMs, favoring the appearance of involuntary loss of urine¹³.

In the present study, the majority of the volunteers in both groups practiced exercise 5 times a week, including weekends. In G1 most practiced more than 3 physical modalities (bodybuilding, aerobic exercises, jump and rhythms). These exercise modalities have a high impact on the PFMs, which may have contributed to the loss of urine. Gymnastics, athletics, bodybuilding, jumping, exercises that require repetitive maximal abdominal contractions, as well as sports with abrupt movement^{9,14} can also be mentioned as activities that lead to loss of urine, as these activities result in impact force on the pelvic floor three to four times greater than body weight¹⁵.

In addition, high-impact physical exercises can lead to an excessive increase in intra-abdominal pressure, which can overload the pelvic organs, pushing them down, causing damage to the muscles responsible for the support of these organs⁶. The prevalence of high-impact exercise can range from 28% to 80%¹⁶.

In the present study, the mean age was higher in the group reporting loss of urine (G1) than in G2. The probability of women with more advanced age presenting urinary dysfunctions is higher than that of younger women¹⁷, due to the natural aging of muscle fibers, reduction in ovarian function, increase in body mass, and pregnancy and multiple vaginal deliveries¹⁸, with a prevalence of 30% -40% in middle age and 30% -50% in older women¹⁹.

In the present study, the PRAFAB questionnaire was used to assess the severity of UI, which identified mild to moderate UI, according to the scores presented in

the protection domain. In addition, the total score averaged 5.85, which also indicates mild severity.

The severity of UI has already been evaluated in another study in women practicing sports²⁰, which evaluated 59 women, 35 amateur soccer players and 24 non-athletes, using the one-hour pad test and the International Consultation on Incontinence Questionnaire (ICIQ-SF). The authors observed that the group of athletes presented greater severity, with no statistically significant difference between the groups by the pad test, with the final result being a higher frequency of UI symptoms in nulliparous female soccer players, however, UI was also present in the control group.

In another study, the severity of UI²¹ was studied in a group of 47 physically active women using the ICIQ-SF questionnaire, which evaluates the frequency, severity, and impact of UI. Loss of urine was observed in 34 women. The mean of the questionnaire score was 10.5 (between 4 and 19 points), demonstrating moderate UI (6 to 12 points).

In the present study, it was also observed that the most prevalent UI was SUI, since, of the 7 participants, 2 reported loss when exercising, corroborating with the study by Barreto et al.²¹ who observed that the highest occurrences of urine loss occurred during the practice of physical activity with a prevalence of 72.3%, followed by coughing and sneezing with 35.2%. It can thus be concluded that physically active women are more likely to present SUI.

Among the limitations of the present study it is pointed out that a large sample was not possible and we did not use a more specific instrument to evaluate the level of physical activity or a questionnaire of image and body perception. Thus, it was not possible to identify if urine loss was due to the activity performed in the gym or to other risk factors for UI, such as age. In view of this, it is necessary to carry out further studies with broader approaches on this subject and with larger sample numbers to evidence the prevalence of UI.

However, physical activity is a risk factor for UI, so these results are important in reformulating the understanding of UI in women who practice physical activities, thus increasing interest in future research and prevention of this problem.

Conclusion

The prevalence of UI in the women exercising in the gyms in the present study was low. However, we hope to make physical education teachers and practitioners aware of the importance of exercising PFMs to prevent involuntary urine loss, especially in individuals with other associated risk factors.

Author contributions

Nazete dos Santos Araujo participated in the design, delineation interpretation of the results. Leidiany Bueno da Silva writing the scientific article. Wyrlla Oliveira Santos writing the scientific article. Cibele Nazaré da Camara Rodrigues statistical analysis of research data, interpretation of results. Érica Feio Carneiro Nunes review and referral of the scientific article

Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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