

# Urinary incontinence among physical education students

INCONTINÊNCIA URINÁRIA ENTRE ESTUDANTES DE EDUCAÇÃO FÍSICA

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## ABSTRACT

Urinary incontinence (UI) is seen as a problem that affects older multiparous women. Little attention has been given to identifying UI in groups of younger or nulliparous women. This study verified the prevalence of UI and the characteristics of urinary loss among young nulliparous female physical education students. Data collection was performed using a questionnaire. Of all 95 students, 61.1% answered the questionnaire. The average age was 21.4 years and 20.7% stated having presented involuntary urine loss. In 75% of cases, urinary loss occurred during sports activities. The students who had experienced urinary loss rated the problem with a 2.3 average score (ranging from 0 to 6), with 0 being no problem and 10 being a serious problem. It is concluded that urinary loss during exercise, though relatively frequent, is not considered a relevant issue for the physical education students.

## KEY WORDS

Students.  
Urinary incontinence.  
Exercise.  
Women's health.

## RESUMO

A incontinência urinária (IU) é vista como um problema que afeta mulheres mais velhas e múltiplas. Pouca atenção tem sido dada para identificá-la em grupos mais jovens ou nulíparas. Este estudo verificou a prevalência da IU e as características da perda urinária entre mulheres jovens e nulíparas, estudantes de Educação Física. Os dados foram coletados através de um questionário. Dentre 95 estudantes, 61,1% responderam ao questionário. A idade média foi 21,4 anos e 20,7% afirmaram já ter apresentado perda involuntária de urina. Em 75% dos casos a perda de urina ocorreu durante as atividades esportivas. As estudantes que tiveram perda urinária quantificaram, em média, o problema com a nota 2,3 (variando de 0 a 6), sendo 0 nenhum problema e 10, problema grave. Conclui-se que a perda urinária durante o exercício, embora seja relativamente freqüente, não é considerada um problema relevante para as estudantes de Educação Física.

## DESCRIPTORIOS

Estudantes.  
Incontinência urinária.  
Exercício.  
Saúde da mulher.

## RESUMEN

La incontinencia urinaria (IU) es vista como un problema que afecta mujeres con edad avanzada y múltiplas y se ha dado poca atención para identificarla en grupos más jóvenes o en nulíparas. Este estudio verificó la prevalencia de la IU y las características de la pérdida urinaria entre mujeres jóvenes y nulíparas, estudiantes de Educación Física. Los datos fueron recolectados a través de un cuestionario. Entre 95 estudiantes, 61,1% respondieron el cuestionario. La edad promedio fue 21,4 años y 20,7% afirmaron haber presentado pérdida involuntaria de orina. En 75% de los casos la pérdida de orina ocurrió durante las actividades deportivas. Las estudiantes que tuvieron pérdida urinaria cuantificaron, en promedio, el problema con la nota 2,3 (variando de 0 a 6), siendo 0 ningún problema y 10, problema grave. Se concluye que la pérdida urinaria durante el ejercicio, a pesar de ser relativamente frecuente, no es considerado un problema relevante para las estudiantes de Educación Física.

## DESCRIPTORES

Estudiantes.  
Incontinencia urinaria.  
Ejercicio.  
Salud de las mujeres.

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## INTRODUCTION

According to the *International Continence Society*, urinary incontinence is the *complaint of any involuntary loss of urine*<sup>(1)</sup>. Since 1998, urinary incontinence has no longer been considered a mere symptom; rather, it is considered a disease by the International Classification of Diseases (ICD/WHO).

It is estimated that 20 million people worldwide have some type of urinary incontinence, and that one out of every four women between the ages of 30 and 59 years have experienced a urinary incontinence episode<sup>(2)</sup>. Depending on the definition used and the population studied, the incontinence prevalence rates can range from 10% to 55% in women between the ages of 15 and 64 years. Only a fourth of these women seek medical care for their urine problem<sup>(3-4)</sup>. In the United States, there are 13 million adults with incontinence, of which 11 million (85%) are women. The country spends up to 16 billion dollars per year on the problem of urinary incontinence<sup>(5)</sup>. Among young women (20-40 years old) the most common type of incontinence is stress urinary incontinence, which refers to the involuntary loss of urine on effort or exertion, such as when sneezing or coughing. Mixed incontinence, which is the combination of urge and stress incontinence, is more common in middle-aged women, especially during menopause. Urge incontinence, which is the involuntary loss of urine associated with an urgent desire to pass urine, is mainly observed among older women<sup>(6-7)</sup>.

Urinary incontinence has a high prevalence and, therefore, it should receive more attention from health services and professionals, considering it affects the quality of life of people with incontinence in their physical, sexual, social, domestic, occupational, and emotional dimensions<sup>(8)</sup>. A study verified<sup>(9)</sup> that there is a negative influence on the quality of life in women with urinary incontinence, especially concerning aspects related to their daily life, social interactions, and personal perceptions about their health condition. Many women with urinary incontinence become *prisoners* of environments where they know there is access to a bathroom, and they may avoid trips to the mall, any leisure activities, long-distance trips, recreational activities, and exercise.

Urinary incontinence can also dissuade women of any age who wish to practice any physical activities. A study found that 20% of women who exercised or practiced sports abandoned these activities because of incontinence<sup>(10)</sup>. There is a hypothesis in the literature, though inconclusive, that physical activities and sports can behave as a risk factor for developing stress urinary incontinence in women who are physically active, athletes or not<sup>(11-15)</sup>. Among women athletes, there are a high number of nulliparas who

complain of incontinence during their physical activities. In the referred study<sup>(10)</sup>, about 28% of athletes with an average age of 19.9 years admitted they experienced urinary incontinence episodes while engaging in sports or during competitions. Another study<sup>(15)</sup> found that 29% of the athletes studied also lost urine during sports. Another author<sup>(13)</sup> found that over half (51.9%) the studied athletes, with an average age of 22.8 years, complained about losing urine during physical activities. Gymnastics and running were among the activities that caused the highest number of loss-of-urine complaints among women who exercised<sup>(10-16)</sup>.

As for non-athlete nullipara women, one study<sup>(17)</sup> found a high frequency of loss-of-urine complaints among physical education students. The authors compared a group of physical education students with nutrition students. The students were, on average, 22.9 years old. About 26% of the physical education students reported losing urine during physical activities. This rate was 19% among nutrition students. Although this difference was insignificant, the comparison between physical education students who exercised more than three times a week and sedentary nutrition students showed there was a significantly higher prevalence of stress urinary incontinence: 31% against 10%, respectively.

In our search, we did not find any national epidemiological studies regarding the relationship between urinary incontinence in athlete- and non-athlete women, or studies that addressed urinary incontinence in physical education students. The data found in the international literature are from a limited number of studies that only started to be developed in the late 1980's.

The relevance of developing a study involving physical education students and urinary incontinence lies within the fact that future physical education professors should be aware that physical activities and sports that increase urine loss could cause embarrassment or even encourage students to abandon those activities. By disseminating the present study, we hope to contribute to improving the discussions on this subject, informing professionals in the physical education and health areas about the problem of urinary incontinence in young women who practice sporting and physical activities.

Considering the aforementioned facts and the scarcity of similar studies in our environment, the objectives of the present study were to verify the frequency of urinary incontinence among physical education students of a university in the state of São Paulo; to identify the sports that caused urine loss; to verify the frequency of the different types of urinary incontinence, the frequency of urine loss during sports or at a different moment, and to what extent these students considered it a problem; and to assess the restrictions caused by urinary incontinence.

There is a hypothesis in the literature that physical activities and sports can behave as a risk factor for developing stress urinary incontinence in women who are physically active, athletes or not.

## METHOD

This is a descriptive cross-sectional study, performed with students of a university in the city of Campinas, in the state of São Paulo, during the first six months of 2003. The students were regular 3<sup>rd</sup> or 4<sup>th</sup> year physical education undergraduates of either the day or night courses.

The sample consisted of 95 female students aged between 19 and 26 years. The inclusion criterion was to be nullipara, and subjects would be excluded if they were pregnant.

Data collection was done using a questionnaire developed by the authors, which was previously tested on a group of nursing students. The data collection questionnaire was developed based on previous studies<sup>(6,12)</sup>, and was comprised of 12 questions, described below:

I- The first four questions addressed the subject's age, their year in the physical education course, the physical activities they practiced and how often they practiced those activities.

II- Two questions referred to urinary incontinence symptoms. The subjects were asked: *Have you ever lost any urine by accident?* They were also asked how that urine loss occurred: during physical effort, coughing, or sneezing; or after feeling an urgent desire to pass urine, before or on the way to the bathroom; or in both situations.

III- Four questions addressed: in what situation did the first urine loss episode happen (away from sports, during sports, or in both situations); how often did the urine loss occur away from practicing physical activities; how often did it occur during physical activities; and what activities caused urine loss.

IV- The final part of the questionnaire consisted of two questions about the influence that urine loss had on the students' lives. They were asked if the incontinence caused any problems such as keeping them from going to places they usually would go, not practicing leisure or other physical activities, and to specify what activities they referred to. The students were also asked to rate their urine loss problem with a score from 0 (no problem) to 10 (serious problem).

The project was approved by the Research Ethics Committee at the institution (number 070/2003). Students were informed about the purpose of the study and signed the Free and Informed Consent Form. Before answering the questionnaire, the students were offered the opportunity to ask questions and assuage any doubts. The questionnaire was administered on a previously established date and time.

The answers to the questionnaire were inserted in a data bank using EPI-INFO 6.0. The data bank was reviewed for

consistency and completeness before the analysis. The variables were submitted to descriptive analysis and presented in tables.

## RESULTS

Of the 95 students enrolled in the 3<sup>rd</sup> and 4<sup>th</sup> years of the physical education course, 58 (61.1%) answered the questionnaire. The other students were not available during the data collection period because they were participating in activities off the university campus. None of the invited students refused to participate in the study.

The students' average age was 21.4 ( $\pm$  1.7) years, ranging between 19 and 26 years. They were all nullipara, i.e., they had never given birth, and none were pregnant.

As for the physical activities and sports (type and frequency) presented in Table 1, 51.7% of the students reported the activity they most practiced was gymnastics, followed by weight lifting (20.7%), and running (15.5%). The activities were practiced on average three times a week.

**Table 1** - Physical activities and sports practiced by 3<sup>rd</sup> and 4<sup>th</sup> year students of the physical education course - Campinas - 2003

Modality	Frequency	
	N	%
Gymnastics	30	51.7
Weight lifting	12	20.7
Running	9	15.5
Basketball	6	10.3
Volleyball	6	10.3
Swimming	6	10.3
Handball	5	8.6
Soccer	4	6.9
Walking	4	6.9
Water aerobics	4	6.9
Step aerobics	3	5.2
Rope jumping	3	5.2
Bike riding	2	3.4
Tennis	2	3.4
Others	6	10.3
Did not answer	1	1.7

Note: The respondents stated one or more modalities (N=58)

The complaint regarding urine loss was verified through the question: *have you ever lost any urine by accident?* Table 2 shows that 12 (20.7%) students reported urine loss, nine (75%) of whom experienced that loss in sports, and three (25%) away from sports. There were no cases of urinary incontinence occurring in both situations, i.e., in and away from sports. The activities that caused urine loss were mainly swimming (33.3%) and the trampoline (22.2%).

**Table 2** - Physical activities and sports that caused complaints about involuntary urine loss among 3<sup>rd</sup> and 4<sup>th</sup> year physical education students - Campinas - 2003

Modality	N	%
Swimming	3	33.3
Trampoline	2	22.2
Water aerobics	1	11.1
Running	1	11.1
Basketball	1	11.1
Handball	1	11.1
Gymnastics	1	11.1
Weight lifting	1	11.1

Note: The respondents stated one or more modalities (N=9)

It was found that six (50%) students complained about urine loss especially during physical efforts, thus characterizing stress urinary incontinence; five students (41.7%) complained about urge-incontinence, and one student complained about mixed incontinence.

Urine loss frequency in sports ranged considerably, being rated as *frequent* in 22.2% of cases; *sometimes* in 33.3%, *rarely* in 22.2%, and *only once* in 22.2%.

Urine loss away from sports was less frequent, being rated as *rarely* in two cases (16.7%), and as *only once* in one case (8.3%).

As for the changes that urinary incontinence had on the students' lives, only one of them reported she preferred to practice the activity alone or wear dark clothes to avoid showing the urine loss. In the question that students were asked to quantify their urine problem by giving a score from 0 to 10, the average score they gave was 2.3 (SD± 2.1), ranging from 0 to 6.

## DISCUSSION

Urinary incontinence among young nullipara women, though not broadly discussed or known, has often been addressed in the scientific literature<sup>(14)</sup>. Previous studies<sup>(18-19)</sup> have reported a high incidence of urinary incontinence among nursing students aged 17 to 25 years. The authors of these studies found complaints for 52.4% and 50.7% of these women, respectively. The cause for such a high prevalence remains unknown, but some hypotheses have been presented. The cardinal and utero-sacral ligaments, in addition to the connective tissue, can be injured if they lose their mechanical efficiency due to repetitive increases in the intrabdominal pressure caused by heavy manual occupations and chronic coughing<sup>(12)</sup>. Young nullipara women do not have any ligament rupture, fascia injuries, or injuries to muscle fibers or pelvic floor nerves caused by pregnancies and deliveries. Therefore, one of the explanations for these women having incontinence could be that they

have a genetic weakness of the connective tissue, a lower pelvic floor, or a reduced number of muscle fibers in this region<sup>(15)</sup>.

According to the literature, urinary incontinence is frequent among young nullipara women who practice physical activities and sports<sup>(14,15)</sup>. There is still no conclusion in the literature in this respect, but physical activities that demand maximum effort and are of high impact can be a risk factor for developing urinary incontinence<sup>(10,16-17)</sup>. In physically active women, stress urinary incontinence is the most frequent type, which refers to the involuntary loss of urine during an effort (like sneezing, coughing, laughing, and during physical activities) that causes an elevation of the intra-abdominal pressure. High-impact activities, like gymnastics, running, basketball, and handball, for instance, can cause an exaggerated increase in one's intra-abdominal pressure, and a possible overload on the organs in the pelvic region, forcing them downwards. This can injure the muscles responsible for supporting the pelvic organs. The physical activity can make the urinary incontinence "evident", meaning it is noticed only after performing physical activities that predispose urine loss in women who do not have any risk factors like old age and parity.

The frequency of complaints about urinary incontinence in our study was consistent with international studies. In our study, 20.7% of students reported losing urine, 15.5% of whom lost urine during participation in sports. These results are similar to the 26% found in another study, also involving physical education students<sup>(17)</sup>.

We did not find any national epidemiological studies addressing the prevalence of urinary incontinence among nullipara women who practiced physical activities. This issue should be addressed by health professionals since, over the last decades, there has been an increase in women's participation in physical and sporting activities.

The studies showed that the activities with the highest number of complaints about losing urine during practice were gymnastics and running. In a study with 156 nullipara athletes with an average age of 19.9 years, 28% reported losing urine during their sporting activity<sup>(12)</sup>. Gymnastics was the sport that showed the highest urine loss rates (67%), followed by basketball (66%), tennis (50%), hockey (42%), tracking (29%), swimming (10%), volleyball (9%), softball (6%). In our study, the complaints about handball and basketball were 11.1%.

In individual sports, the highest prevalence of urinary incontinence is observed among gymnasts. The stress over the abdominal region is very rigorous and causes a significant increase in the intra-abdominal pressure, resulting in urine loss during this activity<sup>(10,15)</sup>.

In our study, the complaints about urine loss were 11.1% by students who practiced gymnastics and 22.2% among those who practiced trampoline. In the literature, the highest prevalence of urine incontinence was found in young

people who practiced trampoline. Among the 35 athletes who practiced this sport, 80% complained about losing urine during this activity<sup>(16)</sup>. Authors believe that there is a reduction in the collagen concentration in the perineum region in athletes, and this could be the cause for the high urinary incontinence rates among these specific athletes<sup>(10)</sup>.

In our study, the water activities caused urine loss in 44.4% of the students (33.3% during swimming and 11.1% during water aerobics). The literature states that swimming is the sport that least causes urine loss among athletes and non-athletes, and it is considered a low-impact sport. However, it was observed that there can be some confusion in the perception of humidity and urinary incontinence, since many athletes find it difficult to notice the loss of urine while they are in the water<sup>(12)</sup>.

Weight lifting is considered an exercise that promotes a considerable elevation of the intra-abdominal pressure, causing urine loss. Some authors believe that this statement is not yet conclusive, since the studies that evaluate the relation between weight lifting and urinary incontinence are performed exclusively with questionnaires, which are not able to evaluate the intensity of the exercise, nor the type of weight<sup>(10)</sup>. Among the subjects, 11.1% complained about losing urine during this activity.

Most students who participated in our study presented stress urinary incontinence symptoms. This is the most common type of incontinence among people who practice physical activities, and it occurs more frequently in young women, who are aged between 25 and 49 years<sup>(4)</sup>.

Some studies state that many women consider urinary incontinence an obstacle to practicing physical activities. In the present study, urinary incontinence did not appear to be an issue for the physical education students, since they gave a score of 2.3 to their problem. The reason why these students do not consider urinary incontinence to be a problem in their lives remains to be discovered, and therefore deserves further investigations. However, some studies have shown that practicing physical activities is related especially to the severity and frequency of incontinence, as well as one's motivation to exercise. Women usually present severe and very severe symptoms, and those with frequent urine loss episodes are the ones that present the lowest levels of participation in physical activities<sup>(20)</sup>. Another factor related to whether women with incontinence practice physical activities or not, besides the symptoms, is their motivation towards this activity. Women who are more motivated to exercise tend to undervalue the urine loss episodes whereas women less motivated overvalue them<sup>(15,20)</sup>.

Urinary incontinence causes many women to quit practicing physical activities and sports, since they feel constrained and embarrassed by the possibility of losing urine while exercising and in front of other people. We believe that this constraint can be extended not only to those

women who are students or athletes, but also to the teacher or coach who is often in a position of showing the correct form to execute an exercise, a step, or a game move. There are already many studies that defend the importance of stimulating the contraction of pelvic floor muscles during physical education classes, gym classes, and sport training sessions. This way, the physical activity can also behave as an activity to prevent urinary incontinence.

As mentioned previously, there is a scarcity of epidemiological studies in the literature that address women who practice physical activities, and, more specifically, physical education students. Our results present a significant prevalence of frequency of urinary incontinence among physical education students, which is in agreement with the international literature, despite the casuistic being relatively small. However, to infer these data over a larger population, broader and more comprehensive studies must be encouraged.

## FINAL CONSIDERATIONS

As the number of women who practice physical and sporting activities increase throughout the world, there should also be an increase in the concern regarding the risks that some exercises can cause. The literature is not conclusive about physical exercise being considered one of the etiologies of urinary incontinence. It has, however, been well established that during physical activities, there is an exacerbation of urine loss episodes.

Physical education professionals are responsible for teaching and learning activities about physical activities and sports at school, clubs, gyms, sports arenas, and in sport training. It is essential for these professionals to acquire knowledge regarding issues that involve the relationship between urinary incontinence and physical activities, so as not to disregard their existence and transmit negligent attitudes, thus contributing to worsening of the problem.

The identification of urinary incontinence among physical education students and professionals, as well as among general women who practice physical activities, can lead to new reflections about the education of these professionals as well as health professionals. These reflections could evidence the need to address this subject in the undergraduate and graduate curricula, in addition to encouraging multi-professional studies, considering the lack of studies on the referred subject in our environment, which counts for very few scientific publications<sup>(21)</sup>.

The team work of physical educators, nurses, physicians, and physiotherapists could lead to the development of strategies that seek the prevention of urinary incontinence among professors and students, thus avoiding the pitfall of students and athletes disengaging from their physical activities and sport and losing the benefits of regular exercise.

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