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ORIGINAL RESEARCH

Frequency of urinary incontinence in women who practice crossfit: a cross-sectional study

Frequência de incontinência urinária em mulheres praticantes de crossfit: um estudo transversal

Frecuencia de incontinencia urinaria en mujeres que practican crossfit: un estudio transversal

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ABSTRACT | The aim of this study was to determine the frequency of urinary incontinence (UI) in women who practice crossfit. This was a cross-sectional study with women aged between 18 and 35 years, who had been practicing crossfit for at least six months without interruption, and at least three times a week. Individual assessment questionnaires were used, composed of sociodemographic, anthropometric and exercise data, as well as the International Consultation on Incontinence Questionnaire – Short Form (ICIQ-UI-SF) to identify the presence of UI. The frequency and amount of urine loss and UI interference in quality of life (QoL) were also identified via ICIQ-IU-SF. These women also responded to a questionnaire about the severity of UI. The total sample of the study was 50 women, of whom 10 (20%) had UI. Most incontinent women had moderate UI and mild interference in QoL. Moreover, we observed an association between having UI history and presenting UI (PR=5.33, 95% CI=1.41 to 20.10). Given the above, we concluded that the frequency of UI in female crossfit athletes was 20%, with UI being mostly of moderate severity and mild interference in QoL.

Keywords | Urinary Incontinence; Exercise; Crossfit.

RESUMO | O objetivo deste estudo foi verificar a frequência de Incontinência Urinaria (IU) em mulheres praticantes de Crossfit. Realizou-se um estudo de corte transversal com mulheres que praticavam Crossfit há, pelo menos, 6 meses ininterruptos, com idade entre 18 a 35 anos e frequência de treino de, no mínimo, três vezes por semana. Foram aplicados questionários de avaliação individual compostos por dados sociodemográficas, antropométricos e esportivos, além do International Consultation on Incontinence Questionnaire – Short Form (ICIQ-UI-SF), para identificar a presença de IU. Também por meio do ICIQ-IU-SF foram identificados a frequência e quantidade de perda de urina e interferência da IU na qualidade de vida (QV) das mulheres incontinentes. Essas mulheres também responderam a um questionário acerca da gravidade da IU. A amostra total do estudo foi de 50 mulheres, das quais 10 (20%) apresentaram IU. A maioria das mulheres incontinentes apresentou IU de gravidade moderada e de interferência leve na QV. Ademais, observou-se associação entre ter histórico de IU e apresentar IU (RP=5,33; IC95%=1,41 a 20,10). Diante do exposto, conclui-se que a frequência de IU em mulheres praticantes de Crossfit foi de 20%, sendo a IU, em sua maioria, de gravidade moderada e de leve interferência na QV.

Descritores | Incontinência Urinária; Exercício; Crossfit.

RESUMEN | El objetivo de este estudio fue evaluar la frecuencia de incontinencia urinaria (IU) en mujeres que practican crossfit. Se realizó un estudio transversal con mujeres que habían practicado crossfit, como mínimo, durante 6 meses ininterrumpidos, con edades entre 18 y 35 años y una frecuencia de entrenamiento de al menos tres veces por semana. Se aplicaron cuestionarios de evaluación individual que constó de datos sociodemográficos, antropométricos y deportivos, además del *International Consultation on Incontinence Questionnaire – Short Form* (ICIQ-UI-SF) para identificar la presencia de IU. También se identificaron la frecuencia y cantidad de pérdida de orina y la interferencia de la IU en la calidad de vida (CV) de las mujeres con incontinencia utilizando el ICIQ-IU-SF. Esas mujeres también respondieron

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a un cuestionario sobre la gravedad de la IU. La muestra total del estudio se compuso de 50 mujeres, de las cuales 10 (20%) tenían IU. La mayoría de las mujeres con incontinencia presentaban IU de gravedad moderada e interferencia mínima en la CV. Además, se observó una asociación entre haber presentado antecedentes de IU y tener IU (RP=5,33; IC95%=1,41 a 20,10). Se concluye que la frecuencia de IU en mujeres que practican crossfit fue del 20%, y que la IU se presentó, en su mayoría, de gravedad moderada y de interferencia mínima en la CV de ellas.

Palabras clave | Incontinencia Urinaria; Ejercicio; Crossfit

INTRODUCTION

The International Urogynecological Association (IUGA) and the International Society of continence (ICS) define urinary incontinence (UI) as any involuntary loss of urine and classify it according to the aspect that induces the loss. The following types of the condition can be noted: urge incontinence caused by overactive bladder (OAB), stress urinary incontinence (SUI) – characteristic of situations with increased intra-abdominal pressure, such as coughing, sneezing and physical exertion –, and mixed urinary incontinence (MUI) – when loss occurs in both situations[1,2].

The prevalence of UI in physical activity practitioners is variable and depends on the types of physical activities[3]. Some studies associate training load, amount of time (hours/week) of physical activity and weekly frequency of exercise with involuntary loss of urine[4,5]. As such, women who have UI may stop practicing exercises due to discomfort arising from embarrassment. Among female athletes, UI can compromise concentration and performance in sports, in addition to inducing water restriction and influencing the abandonment of sporting practices[6-9].

In the context of physical exercises, crossfit emerges as a new training method that involves the practice of diverse functional and sports exercises, often at high intensity[10,11]. The few existing studies on crossfit address the physiological demand in this exercise modality and are mainly concentrated on the risks of injury and muscle damage[12,13]. However, researchers must consider that the crossfit exercises greatly increase intra-abdominal pressure and as such may directly affect the pelvic floor muscles, which in turn may influence the risk of developing UI[14].

Given this context, the objective of this study was to verify the frequency of UI in female crossfit practitioners. The objective was also to determine the severity of UI and its interference in the quality of life (QoL) of affected women.

METHODOLOGY

This is a cross-sectional study carried out at the gyms We Crossfit and Qualimove CrossFit (Recife, PE), in the period from October to November 2018. The project follows Resolution 466/2012 of the National Health Council and was approved by the research ethics committee of the Centro Universitário Estácio do Recife (CAAE: 95966618.0.0000.5640).

Study participants were women aged 18 to 35 years, at menacme, who were crossfit practitioners for at least six uninterrupted months and with a minimum frequency of training three times a week. Being pregnant, active urinary infection, withdrawal from training due to injuries, practicing another sport, history of urogynecological disease, previous urogynecological surgery, renal or neurological disease, urogynecological malformation and current or previous pelvic cancer were considered as exclusion criteria.

The researchers involved were initially trained on the questionnaires applied. Potential participants were approached before the start of their training session or after finishing it to verify the eligibility criteria and interest in participating in the study. If they were considered eligible and agreed to participate, the volunteers were invited to read and sign the informed consent form.

The women then responded to an individual assessment sheet prepared by the researchers, containing sociodemographic, anthropometric and exercise information, and data on the presence of intestinal constipation and UI history. To verify self-reported UI, the volunteers also answered the sixth question of the International Consultation on Incontinence Questionnaire – Short Form (ICIQ-ITA-SF)[15]. When the women's response indicated the presence of UI, the entire ICIQ-UI-SF instrument was applied, a questionnaire translated and validated into Portuguese, aimed at identifying the type of UI and evaluating the frequency, quantity and type of loss and the interference of UI in quality of life[15]. Moreover, to assess the severity of UI, the Incontinence Severity Index (ISI)[16]

was also applied, in its translated and validated version for the Portuguese language[17].

The collected data were tabulated and analyzed in the Microsoft Excelâ program, which also used the confidence interval calculator provided by PEDro (Physiotherapy Evidence Database)[18]. A descriptive analysis was performed by calculating frequencies and measures of central tendency and dispersion, including means, standard deviations and 95% confidence intervals (95%CI) of the variables. The prevalence ratio (PR) and their respective 95%CI were calculated to verify the existence of an association between the presence of UI in athletes and intestinal constipation, training time, weekly training frequency and UI history in the participants.

RESULTS

During data collection, 53 women were considered eligible, however three refused to participate due to lack of time (n=2) or personal reasons (n=1). Therefore, 50 female crossfit practitioners participated, with 28.56 years as the mean age. Most participants were single (76%), with no previous pregnancy (94%) and no previous childbirth (94%). Mean family income was R$10,000 and mean schooling was17.34 years. Regarding the data related to the workouts, the mean practice time of crossfit was 16.8 months, with training duration of 60 minutes (92%) and median number of weekly workouts of 5 (Table 1).

Table 1. Anthropometric, sociodemographic, urinary and sports characteristics of women who were crossfit practitioners. Pernambuco, Brazil, 2018

Variable	n	%
Age (years) a	28,56±4,46	
Weight (kg) [a]	63,11±8,61	
BMI (kg/m²) [a]	23,40±2,61	
Family income (R$) [a]	10.006±5.802,74	
Schooling years [a]	17,34±2,34	
Marital status		
Single	38	76
Married	12	24
Urinary Incontinence	10	20
Nocturia	20	40
Urination urgency	4	8
Intestinal constipation	9	18
Practiced another sport before crossfit	32	64
Crossfit practice time		
<12 months	29	58
Between 12 and 24 months	9	18
>24 months	12	24

[a]: Values expressed in mean ± standard deviation.

Ten of the 50 volunteers of this study reported UI. Thus, the frequency of UI observed was equal to 20% (95%CI: 0.1124 to 0.3304), with most women (80%) having SUI. Table 2 presents the other urinary characteristics of incontinent women.

Table 2. Characteristics of urinary symptoms of female crossfit practitioners and presented urinary incontinence (n=10). Pernambuco, Brazil, 2018

Variable	n	%
Types of UI		
Stress incontinence	8	80
Urge incontinence	1	10
Mixed incontinence	1	10
Frequency of urine loss		
Once a week or less	6	60
2 or 3 times a week	3	30
Several times a day	1	10
Amount of urine loss		
Small amount	9	90
Moderate amount	1	10
UI interference in quality of life		
No interference	4	40
With interference 2 on the VAS	3	30
With 3 interference on the VAS	1	10
With 4 interference on the VAS	1	10
With 5 interference on the VAS	1	10
Strategies for UI management		
Yes	7	70
No	3	30
Voluntarily reported UI to a healthcare professional		
Yes	4	40
No	6	60
Questioned about UI by a health professional		
Yes	4	40
No	6	40

UI: urinary incontinence; VAS: Visual analogue scale.

The odds ratio between having a history of IU and having IU was PR=5.33 (95% CI=1.41 to 20.10), whereas PR=1.95 was observed between having IU and having intestinal constipation (95%CI: 0.62 to 6.13). The odds ratio was also calculated between training time (dichotomized in up to one year of crossfit practice, and more than one year) and the presence of UI. In this case, the result was PR=1 (95%CI: 0.32 to 3.1). The same odds ratio was calculated considering up to two years of training and more than two years of training, and we could see that, in this sample, women who practiced crossfit for more than two years presented more UI (PR=2.75; 95%CI: 0.92 to 8.22). Regarding the frequency of training per week (dichotomization: less than 5 times per week and ^{3}5 times per week), PR=3.14 (95%CI from 0.74 to 13.33) was observed.

DISCUSSION

The frequency of UI in women who practice crossfit identified in this study was 20%; however, when we generalize this data to the population of women who practice crossfit, there is a 95% probability that the real value of UI frequency in this population is between 11.24% and 33.04%. Most incontinent women presented SUI (80%) and reported urine loss in small amounts (90%). Furthermore, 60% of incontinent athletes presented moderate severity UI, 40% reported no impact on quality of life, 40% reported mild impact and 20% moderate impact.

Corroborating our findings, a cross-sectional study conducted with 41 women who practiced crossfit (mean age: 31.5 years) for at least six months also found a 20% frequency of UI among the participants[19]. Another cross-sectional study involving a sample of 488 young adult women observed a 24.6% prevalence of UI in women who performed high-impact physical activities (mean age 25.68 years)[20].

Involuntary loss of urine is known to interfere with the quality of life of women who suffer from this disease[21]. However, despite participants of our study presenting UI of moderate severity, the disease was found to have no impact or mild impact on the quality of life of most crossfit practitioners. This result may be justified by the fact that most women (90%) lose urine in small amounts. In line with our research, a previous study involving women practicing high-impact physical exercises also identified, through the ICIQ-UI-SF instrument, a mild interference of UI in the quality of life of the affected athletes[22].

One of the factors often associated with UI is intestinal constipation. In July 2014, one study established the following risk factors for SUI: women with two or more children, who had chronic cough, diabetes mellitus and constipation. In this study, constipated women presented 2.8 more IU than non-constipated women (PR=2.8; 95% CI: 1.2 to 6.8)[23]. In our study, women who practice crossfit and have intestinal constipation presented 95% more UI than women who practice crossfit and do not have intestinal constipation (PR=1.95; 95% CI: 0.62 to 6.13). However, this result is still inaccurate to confirm this association in the population of women who practice crossfit.

The PR between training time and the presence of UI was also calculated, but no association was found between training time comparing women who have been training for up to one year and those who have been practicing crossfit for more than one year, with the presence of UI (PR=1; 95%CI: 0.32 to 3.1). As such, one year may not be enough time for the occurrence of UI in women who practice crossfit. Another PR was then calculated considering a practice time of up to two years and more than two years of training, and we could observe that women who have been practicing crossfit for two years or more presented 2.75 times more UI than women who have practiced crossfit for less than two years (PR=2.75; 95%CI: 0.92 to 8.22). However, it is impossible to indicate that this association exists in women who practice crossfit, as the 95%CI includes nullity.

The study that investigated the presence of UI in female athletes of high-impact sports identified a relationship between the time of practice of the sport and the presence of UI. However, this relationship was only observed when the practice time was dichotomized to less than or equal to eight years and greater than eight years (PR=2.7; 95%CI: 1.4 to 4.98)[24]. Our sample was composed essentially of women who practiced crossfit for less than two years. Only a small portion of the sample had practice time over two years (24%) and even then this time did not exceed five years. Thus, the practice time presented by the sample may also explain the lack of statistically significant results.

Also relating UI to the training volume of crossfit, the PR between the weekly training frequency and the presence of UI was calculated. The PR result was 3.14 (95%CI from 0.74 to 13.33), indicating that, in our study, women who practice crossfit and have a weekly training frequency equal to or greater than five workouts presented 3.14 times more UI than women

who practice crossfit and have a weekly frequency under five. However, the 95%CI obtained is inaccurate and considers nullity, thus it is impossible to state that this association exists in the population in question. We also calculated the PR between having a history of UI and presenting UI and could conclude that, in the sample, women who practice crossfit and have a history of UI presented 5.33 more IU than women who practice crossfit and do not have a history of UI (PR=5.33; 95%CI=1.41 to 20.10).

A relevant aspect to be addressed is that six (60%) volunteers who presented UI said they had never been questioned by health professionals, nor spontaneously reported urinary symptoms to a health professional. This can be explained by the fact that women think it is something common, easy to resolve, or by being ashamed of the condition. However, this should be dealt with in a thoughtful manner, as many women with UI may feel constrained in social activities and sports practices, as well as less interested in sexual activities, which may influence possible depressive symptoms, decreased self-esteem, and anxiety[23]. We thus suggest that professionals who accompany crossfit athletes be instructed about UI to provide better assistance regarding the urinary symptoms that athletes might present.

Finally, it is important to highlight two important limitations of our study. The failure to perform the sample calculation, which possibly contributed to the inaccuracy found in our results. Given the 95% confidence interval, we believe that an increase in the sample may favor the association between the variables studied. Another aspect that may have interfered with the results was the fact that the majority of the sample in the present study had been practicing crossfit for a year or less, which may be insufficient time to observe the occurrence of UI and its associations in the women in our sample.

CONCLUSION

A UI frequency of 20% was observed in female crossfit practitioners. SUI was the most common type, and most women had a moderate severity UI with a mild impact on quality of life. The reports of incontinent women showed a predominance of occurrence of episodes of urinary loss once per week or less, and in small amounts. In addition, a statistically significant association was found between having a history of UI and presenting UI.

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