

# PREVALENCE, RISK FACTORS AND BOTHER OF URINARY INCONTINENCE IN NULLIPAROUS, YOUNG, HIGH LEVEL RHYTHMIC GYMNASTS. A CROSS-SECTIONAL STUDY

Abstract  
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## Introduction

The prevalence of urinary incontinence (UI) in elite athletes and strenuous exercisers is high, especially in sports involving high impact activities (running and jumping) (1). Rhythmic gymnastics is a female Olympic sport combining the beauty and elegance of classical ballet with the strength and fitness of artistic gymnastics. The gymnasts perform routines with music, either as individuals or in groups, and execute enormously difficult maneuvers with hand-held apparatus: hoop, ball, clubs, ribbon and rope. All routines include stunning leaps, turns, balances and acrobatic maneuvers.

There is a paucity of research on risk factors for UI in young nulliparous women in general, but eating disorders, low Body mass Index (BMI) and hypermobility have been suggested (2). Rhythmic gymnasts train extensively, are young, have low BMI and have a high prevalence of eating disorders (2). No studies of pelvic floor dysfunctions have been found in this specific group of athletes.

## Aim of study

The aim of the present study was to investigate the prevalence and risk factors for UI in rhythmic gymnasts. Furthermore to investigate the impact of UI on performance and their knowledge of the pelvic floor and pelvic floor muscle training.



## Results

Among the 107 enrolled in the study (80.5% response rate), all answered the questionnaire and fulfilled the clinical examination. Mean age was 14.5 (SD 1.6) years, mean BMI was 18.9 (SD 2.2) with 47 gymnasts (43.9%) having a BMI  $\leq 18$ . Mean age when starting with rhythmic gymnastics was 7.5 years old (SD 1.9), and mean number of years as a competing gymnast was 4.3 (SD 1.5) years. Mean hours of exercise per week was 15.7 (SD 7.8). Fifty rhythmic gymnasts were classified as hypermobile, 37 (34.6%) had not reached menarche age, and 10 (9.3%) reported former or present disordered eating.

Thirty-four (31.8%) reported UI with 21 (61.8%), 3 (8.8%) and 6 (17.3) reporting SUI, urgency urinary incontinence and mixed incontinence, respectively. Of those reporting SUI, 12 of 21 (57.1%) reported leakage only during physical activity while 2 of 21 (9.5%) were incontinent only during sneezing and coughing. Mean impact on daily activities was 1.2 (SD 1.1), with 14 (13.1%) scoring  $\geq 5$ . Two participants scored 10. The total score on ICIQ was 4.7 (SD 2.1).

Upon questions on how UI affected sport performance 47% reported that it had some effect on performance; 10 (29.4%) reported to be afraid of visible leakage and 5 (14.7%) that they anticipated leakage to happen again. Seventy-four (69.1%) had never heard about the pelvic floor. Seventy-nine (73.9%) did not know why, and eighty-three (77.6%), how, they should train the pelvic floor muscles.

Univariate analysis did not show any relationship between report of UI and former or present report of disordered eating. Odds ratios for possible risk factors for SUI is shown in Table 1. Hypermobility, BMI  $\leq 18.5$ , menarche and hours of exercise per week were not found to increase the odds of SUI in rhythmic gymnasts in the present study.



## Materials and Methods

This was a cross-sectional study including all rhythmic gymnasts competing at the highest national and international level in one single country. One-hundred and thirty-three gymnasts were invited to participate.

Background data on demographics and risk factors were collected via an electronic questionnaire. UI was assessed by Urinary Incontinence short form (ICIQ-UI SF). Gymnasts were categorized as continent if they answered "never" to the question: "How often do you leak urine"? Women were classified with SUI if they answered: "leaks when you cough or sneeze" and/or "leaks when you are physically active/exercising" to the question "When does urine leak"? (3)

The "Triad-specific self-report questionnaire" was applied to assess the female athlete triad. The triad involves three components: 1) low energy availability with or without disordered eating, 2) menstrual dysfunction, and 3) low bone density.

Prevalence of benign hypermobility joint syndrome was assessed clinically using Beighton score. Gymnasts were categorized as being hypermobile if they scored on 5 or more out of 9 variables.

Background variables are presented as numbers with percentages or means with standard deviation (SD). Prevalence is reported as frequency and percentage. Risk factors for stress urinary incontinence (SUI) was estimated by logistic regression analysis and reported as Odds ratio with 95% CI. P-value was set to 0.05.

**Table 1.** Odds ratios with 95% confidence intervals (CI) of risk factors for SUI in rhythmic gymnasts (n=107).

	B	Odds ratio	95% CI	P-value
Hypermobility	.799	2.223	.811, 6.092	.120
BMI $\leq 18.5$	.648	1.911	.617, 5.918	.262
Menarche	.974	2.650	.699, 10.046	.152
Hours exercise/w	-.001	.999	.931, 1.072	.975
Constant	-2.748	.064		0.11

## Discussion

The prevalence of UI was above 30%, which is within the range previously found in other sports (0-80%), but lower than in artistic gymnastics (67%) (1). UI negatively affected sport performance in approximately half of the gymnasts. Rhythmic gymnasts may be especially exposed to stigma and embarrassment due to minimal clothing and exposure of the pelvic area during their performance. Expected risk factors were not found to be statistically significant. Several studies have found that reports of UI at an early age is a risk factor for UI later in life. The condition should therefore be treated to prevent the symptoms from progressing (secondary prevention). Most gymnasts had no knowledge of the pelvic floor or pelvic floor muscle training. Elite athletes may need stronger PFM and connective tissue than non-exercisers. The strengths of the present study include the high response rate and use of reliable and valid questionnaires to collect data on UI and expected risk factors. A limitation is that the sample may have been too small to detect statistically significant differences between gymnasts with and without UI/SUI.



## Conclusions

The prevalence of UI in young, nulliparous rhythmic gymnasts is high. None of the expected risk factors were found to increase the odds for SUI in the present study. There is a need for RCTs with high methodological and interventional quality to evaluate the effect of pelvic floor muscle training on this group of young girls exposed to high load and impact on the pelvic floor.

## References

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