

Resistance Training Reduces Urinary Incontinence and Improves the Strength of Pelvic Floor Muscles

#21936



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Abstract

The study investigated the effect of a 12-week progressive resistance training program on urinary incontinence and the strength of pelvic floor muscles in adult women.

The results of this study demonstrated a significant reduction in the Incontinence Severity Index, and the frequency of urinary incontinence. In addition, a significant increase in the maximum strength of pelvic floor muscles was found.

Analysis of the results did not reveal a significant relationship between the strength of pelvic floor muscles and the Incontinence Severity Index.

Our findings suggest that the strength of pelvic floor muscles may be only one contributing factor in the reduction of urinary incontinence. The ability to generate a timely pelvic floor contraction may also play a key role in the control and treatment of urinary incontinence.

Resistance training may be a safe and non-invasive option for the treatment of urinary incontinence and strengthening the pelvic floor.

Introduction

Urinary incontinence (UI) is a significant issue for many women with most studies determining a prevalence in the range of 25% to 45%¹. Pelvic floor muscle exercises are recommended as non-invasive first-line therapy for women with, or at high risk, of developing UI. However, the correct and effective activation of pelvic floor muscles is difficult, and some women cannot activate their pelvic floor muscles correctly.

A timely, effective pelvic floor contraction is essential to counteract increased intraabdominal pressure. The timely and effective activation of pelvic floor muscles to counter increases in intraabdominal pressure, experienced during every day activities, is similar to the instructions for bracing prior to performing resistance training.

The activation of pelvic floor muscles to counteract an increase in intraabdominal pressure during resistance training may increase the strength of pelvic floor muscles and result in improved urinary continence.

This study aimed to investigate the effect of a 12-week progressive resistance training program on the strength of pelvic floor muscles and UI in healthy untrained women.

Methods and Materials

Eighteen women with mild-to-moderate UI and no previous experience in regular resistance-training volunteered to partake in the study. Women were excluded if they had a history of previous bladder surgery, an active urinary tract infection or experience in resistance training. A Resistance Training Pelvic Floor Readiness tool was also developed and participants were further excluded if assessed as not ready to participate.

The Incontinence Severity Index (ISI) tool was used in this study to assess the frequency and severity of UI. Assessment of pelvic floor strength was assessed using perineometry and palpation. Body composition and maximal strength was also assessed.

The training program consisted of weighted back squats, deadlifts, pushups and incline pull-ups. Participants attended an average of two training sessions a week for twelve weeks.

Correct breathing and bracing techniques were practiced with emphasis on activation of the pelvic floor muscles during lifts using the pebble analogy.



Results

Fifteen women were included in the final analysis. A Wilcoxon Signed Rank Test indicated that resistance training had a very large effect on the ISI. At the completion of the study, ten participants reported a lower ISI, while five participants reported no change. No participant reported an increase in UI in response to the training intervention.

Resistance training also showed a very large effect on the frequency of UI. Eight participants reported less frequent UI, while seven participants reported no change in the frequency of UI. No participants reported an increase in the frequency of UI. The effect of resistance training on the severity of UI was not statistically significant.

The results indicated that resistance training had a large effect on the maximum strength of pelvic floor muscles. Thirteen participants showed an increase in the strength of their pelvic floor, while two participants showed a decrease in the strength of their pelvic floor muscles.

Analysis of the results did not establish any significant correlation between the strength of pelvic floor muscles or overall physical strength with the ISI, frequency, and/or severity of urinary incontinence before or after the training intervention.

Table 1. The effect of a 12-week resistance training program on pelvic floor muscle strength and incontinence measures. (n=15)

	Pre-Test	Post-Test	T	z	N-Ties	P	r	Effect Size
	Mean±SD	Mean±SD						
IF	1.80±1.15	1.20±0.86**	0.00	-2.71	8	0.01	-0.96	Large
IS	1.80±1.01	1.60±0.83	0.00	-1.73	3	0.08	-1.00	Large
ISI	4.00±2.51	2.40±1.72**	0.00	-2.97	10	0.00	-0.94	Large
PFMSR (cm H ₂ O)	30.63±11.20	37.19±12.57	24.00	-1.79	14	0.07	-0.48	Medium
PFMSM (cm H ₂ O)	49.53±21.21	74.76±19.49**	3.00	-3.24	15	0.00	-0.84	Large

Incontinence Frequency (IF); Incontinence Severity (IS); Incontinence Severity Index (ISI); Pelvic Floor Muscle Strength at Rest (PFMSR); Pelvic Floor Muscle Strength Maximum contraction (PFMSM).

* significantly different from pre-intervention (p≤0.05)

** significantly different from pre-intervention (p≤0.01)

Discussion

Urinary incontinence as measured by the ISI, reduced by forty percent. The analysis of the effect sizes demonstrated that resistance training had a large and significant effect on the reduction of UI.

Analysis of the frequency and severity of UI revealed that eight participants experienced less frequent UI, while three participants reported a reduction in the severity of UI. The effect of the training program on frequency was statistically significant with a thirty-three percent reduction in the frequency of UI.

The exact mechanisms responsible for the reduction in the frequency of UI is not understood. The strength of the pelvic floor was not correlated with the ISI therefore other factors are most likely contributing to the reduction in frequency. One possibility is that the women gained a better connection with their pelvic floor allowing them to generate a timely, as well as strong, pelvic floor contraction.

The study also showed that in addition to reducing UI, resistance training can have additional benefits such as improving body composition and overall strength.

Conclusion

The results from this study suggest that progressive resistance training may be a safe and non-invasive option for the treatment of UI and a means to improve the strength of pelvic floor muscles. Additionally, resistance training provided additional health benefits to the participants of this study. Further research into the relationship between UI, pelvic floor and strength training is warranted.

References

1. Abrams, P., Cardoso, L., Wagg, A., & Wein, A. (Eds.). (2017). *Incontinence 6th Edition*. Bristol UK: ICI-ICS. International Continence Society