

# Journal of Nephrothology



## The effect of pelvic floor muscles training, bladder exercises and lifestyle modification on urinary incontinence in elderly men

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### ARTICLE INFO

*Article type:*  
Original Article

*Article history:*  
Received: 7 March 2020  
Accepted: 2 June 2020  
Published online: 9 June 2020

*Keywords:*  
Urinary incontinence  
Aging  
Behavioral interventions

### ABSTRACT

**Introduction:** Urinary incontinence is one of the causes of the dependence of the elderly on others and is one of the main reasons for sending the elderly to care centers.

**Objectives:** The aim of this study was to determine the effect of behavioral interventions program on urinary incontinence in the elderly.

**Patients and Methods:** In this quasi-experimental clinical trial (without a control group), 30 elderly men with acute urinary incontinence were selected from elderly care centers in Urmia city using the available sampling method. The intervention included pelvic floor and bladder exercises and lifestyle modification training, individually. The standard ICIQ-SF questionnaire was completed before and after the intervention. The data were analyzed by paired t-test and Wilcoxon tests.

**Results:** The findings showed a statistically significant difference between urinary leakage frequency ( $P=0.002$ ), urinary leakage rate ( $P=0.001$ ) and the effect of urinary leakage on the quality of life ( $P < 0.001$ ) of the subjects before and after the intervention.

**Conclusion:** The results of this study showed that a combination of the pelvic floor and bladder exercises and lifestyle change are effective in decreasing urinary incontinence in elderly men.

**Trial registration:** The trial protocol was registered in the Iranian Registry of Clinical Trials (identifier: IRCT20180808040742N2; <https://en.irct.ir/trial/43204>, ethical code # IR.UMSU.REC.1391.31).

### *Implication for health policy/practice/research/medical education:*

In a clinical trial on 30 elderly men with acute urinary incontinence, we found that a combination of the pelvic floor and bladder exercises and lifestyle change are effective in decreasing urinary incontinence in elderly men.

**Please cite this paper as:** Jafarizadeh H, Maghsoudi Z, Namadi F, Mohammadpour Y, Moradi Y. The effect of pelvic floor muscles training, bladder exercises and lifestyle modification on urinary incontinence in elderly men. J Nephrothol. 2021;10(4):exx. DOI: 10.34172/jnp.2021.xx.

### Introduction

Old age is an ongoing process that continues from birth to death, and comprises changes in the physical, social, mental and psychological dimensions of the person (1). In recent years, due to the decline in morbidity, improved conditions, and increased life expectancy, the number of elderly people is more than any other time in history (2). One out of every 10 people in the world is over 65 years old. It is expected that by 2025, two-thirds of people over 65 years old will be in developing countries

(3). Although the elderly is not a disease, however during aging, the disease rate is increased. The high incidence of illnesses such as blood pressure, heart disease, stroke, diabetes, cancer, respiratory diseases, urinary incontinence and psychiatric disorders are the factors that affect aging. Urinary incontinence is one of the most common diseases and problems of aging (4,5).

According to the International Continence Society, urinary incontinence is a complaint of any involuntary leakage of urine (6). Urinary incontinence can be seen in

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two forms of acute and chronic type, and in both cases, it requires long and continuous care and nursing (7,8). This disorder is divided into three categories; stress incontinence, urge incontinence and overflow incontinence, while the stress incontinence is more common (9,10).

Urinary incontinence is not fatal, but could have many serious and unpleasant complications in the personal and social life of the affected people (10). Millions of people worldwide suffer from this illness and its negative effects on quality of their life (11).

Urinary incontinence not only causes physical problems in a person but also causes psychological, social and economic problems, as well as low-quality of life in patients (6,11). This disease is more common in females than males and it has higher prevalence in elderly in both genders (12). Urinary incontinence is one of the causes of the dependence of the elderly to others and is one of the main reasons for sending the elderly to care centers (13).

This disease affects the quality of life of patients, including their physical and social activities and disrupts their mental and general health including sexual dysfunction, isolation, avoidance of physical activity, avoidance of presence in the community, reduction of social relationships and self-esteem (14,5). A high prevalence of mental illness is also reported among women with urinary incontinence. Depression is one of the most common problems in patients (15).

Medical injuries associated with this problem include fungal and microbial infections such as perineal cellulitis and even squamous ulcers in that area due to the moisture and persistent irritation of the skin with urine, as well as the increased risk of fall and fracture in the elderly due to more referrals to bath and rest rooms for cleaning and changing clothes (11). There are variety of medical and non-medical approaches to reducing pain and problems. Muscarinic-receptor antagonists such as tolterodine and solifenacin decrease bladder contractions by blocking muscarinic receptors in the bladder. However, this group of drugs causes dry mouth therefore, many patients are not bound to the long-term use of the drugs (7). Often, behavioral treatments that are capable of healing the disease and high capability of learning are recommended (7,16).

Despite various treatments especially the behavioral ones, patients accept these treatments much better in the early stages of the disease because they can easily learn behaviors and skills. Meanwhile, some patients do not seek out the treatment and suffer from the disease for many years. The reasons for this include the followings; supposing the disease as a natural age-related change, the lack of periodic health check-up in the health system, the inefficiency of the patient education, and the motivation and consistency of performing the interventions by the

patients as a key factor affecting this treatment (12,17).

Considering the increased number of elderly people and the high percentage of patients with urinary incontinence among them, uncertainty of the medical treatments for these disorders and advantage of behavioral interventions in dimming the complications of urinary incontinence. Therefore, the researchers conducted this study.

## Objectives

The aim of this study was to determine the effect of behavioral interventions program on urinary incontinence in the elderly in Urmia.

## Patients and Methods

### Study design

This study was a quasi-experimental clinical trial without the control group. Since most of the previous studies have studied the urine incontinence in women, therefore, in this study, the elderly men with urinary incontinence who their disease certainly was diagnosed by a physician.

Participants were not using the urinary catheter and had the cognitive ability to receive the training and also had the possibility of mobility and going to the toilet alone or needed the least help, were selected as the research community. Those with urinary catheter and/or the acute urinary incontinence were not included in the study. The sample size was 30 ( $n = 30$ ) for interventional studies and eligible samples were selected from elderly care centers in Urmia city using available sampling method (Figure 1).

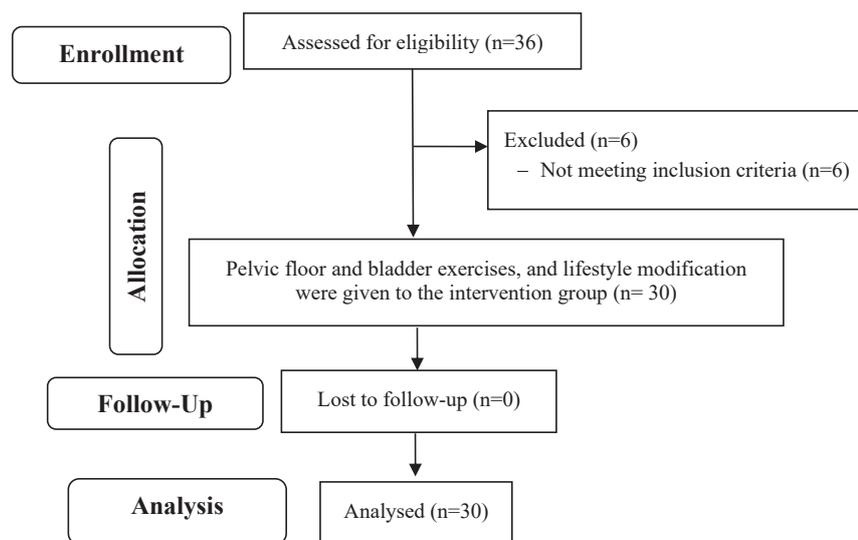
The intervention, based on the study of Cardozo et al (18), included pelvic floor and bladder exercises and lifestyle modification. Individual training was along with answers to questions. The standard international consultation on incontinence questionnaire - short form (ICIQ-SF) was completed before and after the intervention.

### Ethical issues

The research followed the tenets of the Declaration of Helsinki. The study was approved by the ethics committee of the Urmia University of Medical Sciences (#IR.UMSU.REC.1391.31). Prior to participating in the project, the patients were given written consent and informed them about the research objectives. Information from the project was secretly provided only by the project executives. This study was also registered in the Iranian Registry of Clinical Trials (identifier: IRCT20180808040742N2; <https://en.irct.ir/trial/43204>).

### Statistical analysis

SPSS version 20 was used to analyze data where statistical descriptive and analytic tests like mean  $\pm$  SD and paired  $t$  test and Wilcoxon test were applied.  $P < 0.05$  was



**Figure 1.** Process of the study according to the consort flow diagram.

considered as a significant level of differences.

## Results

In total, 30 elderly men living in elderly care centers of Urmia city participated in this study. The mean age of participants was  $73.18 \pm 10.35$  years. Regarding the type of urinary incontinence, 15 people showed stress incontinence, 7 people showed urine incontinence associated with bladder deficiency and 8 people showed the urinary incontinence associated with the bladder overflow.

The Wilcoxon statistical test results showed a significant

difference between urinary leakage ( $P = 0.002$ ), urinary leakage rate ( $P=0.01$ ) and the effect of urinary leakage on the quality of life ( $P<0.001$ ) after the intervention (Table 1).

In this study we found, in 16.6% of the studied subjects, no cases of urinary leakage were reported after the intervention (Table 2). Accordingly, after the intervention, the least possible problem in performing daily life activities due to the effect of the urinary incontinence compared to before the intervention stage was observed (Tables 3 and 4).

**Table 1.** Frequency distribution of urinary leakage times, urinary leakage rate, and the effect of urinary leakage on quality of life in the subjects before and after intervention

Variable		Before intervention		After intervention		Wilcoxon statistical test results
		No.	%	No.	%	
The frequency of urinary leakage	Never	--	--	5	16.6	$Z = -3.08, P = 0.002$
	About once a week	3	10	6	20	
	2-3 times a week	7	23.3	6	20	
	Once a day	9	30	7	23.3	
	Several times a day	11	36.6	6	20	
	Always	--	--	--	--	
Urinary leakage rate	No urine leakage	--	--	4	13.3	$Z = -2.53, P = 0.01$
	Less frequent	19	63.3	19	63.3	
	Average	5	16.6	4	13.3	
	Highly frequent	6	20	3	10	
The effect of urinary leakage on quality of life	None	--	--	--	--	$Z = -3.74, P < 0.001$
	Slight (1-3)	5	16.6	15	50	
	Moderate (4-6)	8	26.6	7	23.3	
	Severe (7-9)	11	36.6	8	26.6	
	Very severe (10)	6	20	--	--	
Standard deviation and overall mean score of the effect of urinary leakage on quality of life		2.61± 6.90		2.60±4.12		Paired <i>t</i> test $t=7.3, df=21$ $P<0.001$

**Table 2.** Frequency of urinary leakage times in the samples before and after intervention

Times	Urinary leakage			
	Before intervention		After intervention	
	No.	%	No.	%
Never	--	--	6	20
Before reaching the toilet	13	43.3	13	43.3
When coughing or sneezing	4	13.3	3	10
During sleep	5	16.6	4	13.3
During physical activity or exercise	3	10	1	3.3
After excretion	4	13.3	3	10
Always	1	3.3	--	--
Total	30	100	30	100

### Discussion

The aim of this study was to determine the effect of pelvic floor and bladder exercises and also lifestyle change on the incidence of urinary incontinence in elderly men. The findings showed a statistically significant difference between urinary leakage frequency ( $P=0.002$ ), urinary leakage rate ( $P=0.01$ ) and the effect of urinary leakage on the quality of life ( $P<0.001$ ) of the subjects before and after the intervention. Generally, pelvic floor muscle exercises along with bladder exercises and lifestyle changes showed a positive effect on the treatment of urinary incontinence. In a study by Cardozo et al to study the new stress urinary incontinence therapies in one of the UK hospitals on elderly women aged 60-70 years showed

that pelvic floor muscle exercises performed concurrently with bladder exercises and also changes in lifestyle could have a tremendous effect on the treatment of urinary incontinence. The results of their study indicated that the incidence of urinary incontinence in elderly who were taught behavioral interventions (including pelvic floor muscle exercises, bladder exercises and lifestyle changes) decreased from 75% to 39% (18), which was inconsistent with the findings of our study.

The review study by Jamrasi et al in regarding the effect of pelvic floor exercises on urinary incontinence suggests the effectiveness of pelvic floor exercises in improving urinary incontinence in women which was in agreement with the results of our study (19). It seems that one of the common causes of urinary incontinence is weak pelvic floor muscle. Studies have shown that the prescription of appropriate exercises for pelvic floor muscle improves or treats urinary incontinence by up to 60%-70% (20, 21). It seems that the trunk's pivotal muscles consisted of the complex of lumbar-pelvic-muscles initiate all movements of the body. In addition, the muscles of this area have a very important role in consolidating the trunk and maintenance of various positions of the body, both in dynamic and static states (22). All of the muscles of this cylinder in dynamic and static daily activities should be activated at the same time to maintain trunk stability in the body's activities. Therefore exercising in the short term increases the muscle strength and endurance of the perineal region, which this improvement has a significant effect on the incontinence symptoms (23). The increase in muscle strength may be conducted through neuromuscular

**Table 3.** Frequency and percentage of the effect of urinary leakage on daily activities before intervention

The effect of urinary leakage on daily activities	Never	Few	Average	High
Ability to do housework	--	13 (43.3)	9 (30)	8 (26.6)
Activities like walking, swimming	4 (13.3)	10 (33.3)	11 (36.6)	5 (16.6)
Going to entertainment centers like cinema, etc	7 (23.3)	7 (23.3)	11 (36.6)	5 (16.6)
The ability to travel by car or bus takes more than 30 minutes of time	6 (20)	9 (30)	10 (33.3)	5 (16.6)
Participation in social activities outside the home	7 (23.3)	8 (26.6)	10 (33.3)	5 (16.6)
Emotional health	--	14 (46.6)	10 (33.3)	6 (20)

**Table 4.** Frequency and percentage of the effect of urinary leakage on daily activities after intervention

Ability to do housework	Never	Few	Average	In most of the cases
Activities like walking, swimming	5 (16.6)	15 (50)	7 (23.3)	3 (10)
Going to entertainment centers like cinema	7 (23.3)	14 (46.6)	9 (30)	--
The ability to travel by car or bus takes more than 30 minutes of time	7 (23.3)	11 (36.6)	9 (30)	3 (10)
Participation in social activities outside the home	7 (23.3)	16 (53.3)	7 (23.3)	--
Emotional health	7 (23.3)	13 (43.3)	7 (23.3)	3 (10)
Ability to do housework	7 (23.3)	9 (30)	11 (36.6)	3 (10)

adaptation mechanisms and improving the coordination of pelvic floor muscle fibers, as well as the simultaneous activation of the motor unit in these muscles (22,23).

The results of our study showed that pelvic muscle exercises and lifestyle change had a positive effect on reducing urinary incontinence. The results of the study conducted by Pérez et al showed that after pelvic floor muscle training the severity of urinary incontinence was significantly different between baseline and 12 weeks, in the intervention group (24). However, it is notable that Kegel exercises could be capable of learning only in people with adequate cognitive and mental abilities. The lack of adherence to healthy lifestyle tips can disrupt the interventions and their usefulness. Correct recognition of pelvic floor muscles and effective contractions is a key point in determining the usefulness of intervention. In case of subjects' unfamiliarity with the muscles, not only conducting the interventions have no positive effects, but also they have negative effects on urinary incontinence especially in the case of abdominal muscle contraction (18).

Different findings have shown that incontinence leads to disturbance in the quality of life of the affected person (11,25). The results of the present study indicated the least impairment in the activities of daily living caused by the effect of urinary incontinence after the intervention compared to before the intervention.

The results of the study by Radziminska et al showed that pelvic floor exercises significantly improved the quality of life of women with stress urinary incontinence (26). Sar et al in a study conducted in Turkey, also concluded that pelvic floor exercises improved the quality of life of women with urinary incontinence (27). Likewise, the results of the study by Borello-France et al showed no significant difference between the quality of life of women with urinary incontinence, while the frequency of pelvic floor exercises varied (28). The difference in the results of this study with our study could be due to the highly less sample number in the Borello's study.

### Conclusion

The results of the present study showed that a combination of pelvic floor and bladder exercises and lifestyle change is effective in decreasing urinary incontinence in elderly men. Considering the fact that this method does not require specific time and location and is always applicable, therefore this study can encourage managers and relevant authorities to consider this method as an efficient method and implement it as an appropriate treatment strategy in hospitals, clinics and elderly care houses with the desire of the patients.

### Limitations of the study

The limitation of our study was the lack of a control group. Therefore other studies with a control group are needed to further evaluate the effect of behavioral interventions program on urinary incontinence in elderly men.

### Acknowledgments

This study approved by Urmia University of Medical Sciences (# 90-2-33-499) and is financially supported by this University. Hereby, the authors would like to sincerely thank all the elderly, authorities and everybody who helped us with this research.

### Authors' contribution

HJ and YM conducted the research. YM and FN helped to prepare the manuscript. HJ and YM prepared the final manuscript. All authors read and signed the final paper.

### Conflicts of interest

The authors declared no competing interests.

### Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

### Funding/ Support

This study was supported by Vice Chancellor of Research and Technology of Urmia University of Medical Sciences. (Grant # 1067).

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