



MACROJOURNALS

# The Journal of **Macro**Trends in Health and Medicine

## Effects of Combined Pelvic Floor Muscle Exercises in Patient with Urinary Incontinence

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### Abstract

*Urinary incontinence is a significant health problem with considerable social and economic impact. Women experience UI twice as often as men. Various factors may affect the development of UI. According to existing studies and literature few women go to consult a therapist who specializes in urinary incontinence in our country. Talking about this kind of problems it is a taboo for most women, especially for women living in small cities or rural area. For them it is difficult to even consider a therapist for such personal problems. Most of the cases women blame their self's for these problems. Purpose of the study: The purpose of the study was to investigate the effects of Combined Pelvic Floor Muscle Exercise (PFME) in patient with Urinary Incontinence. Methodology: 40 patient (women) aged over 18 years old were involved in a randomized control trial. The patients were randomly allocated into two groups, the control group and the experimental group. The experimental group practiced PFME at home, the control group didn't practice PFME at home. Assessment of UI was conducted at baseline and three months. Results: Statistical analysis of the data showed that PFME gives good results in controlling involuntary loss of urine. Conclusion: Physiotherapy is an effective treatment and less cost. To have this method of treatment introduced to patients will have a great impact in Improving their QOL. This treatment isn't very recognized in Albania. One of the best ways to introduce this method will be from the family doctors and from maternity staff who treats the most effected patients, future mothers.*

Keywords: *Urinary Incontinence, Pelvic Floor Muscle Exercise, Pelvic floor muscle training*

### 1. Introduction

Urinary incontinence is a significant health problem with considerable social and economic impact. Prevalence of incontinence in general population of females reported in 13 different studies. Young adult, 20% to 30%; Middle age, 30% to 40%; Elderly, 30% to 50%.<sup>1</sup> Women experience UI twice as often as men. Various factors may affect the development of UI. The

most well known are, pregnancy and childbirth, menopause, overweight and obesity, hormonal disorders, and muscle weakness of pelvic diaphragm.

According to existing studies and literature few women go to consult a therapist who specializes in urinary incontinence in our country.

Talking about this kind of problems it is a taboo for most women, especially for women living in small cities or rural area. For them it is difficult to even consider a therapist for such personal problems. Most of the cases women blame their self's for these problems. Urinary Incontinence has a large impact on the quality of their lives, they are obliged to restrict their outings outside of their houses. UI limits them in their daily activities as in the professional, social and family aspects. Incontinence creates psychological disorders such as anxiety and depression. Limits their physical activities such as walking, running, exercising or swimming. One of the ways to come to the aid of people with such condition as urinary incontinence it is conservative treatment whose main elements are lifestyle modifications (physical activity, dietary habits, and weight loss), bladder control exercises, and pelvic floor muscle training (PFMT).

This treatment it is not very popular or recognized too much in Albania.

## **2. Research methodology**

### *2.1. Participants and study design*

For this randomized control trial were selected randomly 40 women over 18 years old. These women we separated in 2 different groups; "Control Group" and "Experimental Group".

Experimental Group including 19 women, practice PMFE (pelvic floor muscle exercise) exercises at home and Control group including 21 women didn't practice the PMFE exercises. This study was conducted in the period February-April 2014 in the specialized rehabilitation center "Fisiomed" and "Woman Center" at the "Queen Geraldine" maternity in Tirana.

Inclusion criteria: Were included in this study women aged over 18years old who have given birth at least once.

Exclusion criteria: Were excluded from the study women under 18 years of age and those who had not giving birth.

### *2.2. Material and procedure*

The purpose of the study was to investigate the effects of Combined Pelvic Floor Muscle Exercise (PFME) in patient with Urinary Incontinence.

Participants were briefed on the purpose of the study and their inclusion in the study was made with their written consent. Ethical approval was granted by the ethics committee of University of Medicine of Tirana and all patients were fully informed of the plan and goals of treatment. The participants were also informed that they could withdraw from the study at any time without suffering any ill effects whatsoever.

They were evaluated before application musculatures pelvic exercises and again after 12 weeks of application of these exercises. To gather information a questionnaire was used by "International Consultation on Incontinence Questionnaire (ICIQ-SF)", and personal contact with patients.

### 2.3. Statistical analysis

In our statistical analysis we used the “T- Student” test for two sample groups. This is a test that is used to test differences within a group in two different periods or the difference between the two groups in the same period.

**T-student Test** was used to detect the effects of application of PFME exercises and to compare the change of the situation between the two groups before and after application of pelvic floor exercises. The value of  $p < 0.05$  was considered significant value.

Women were randomly divided into two groups;

**Group A** (experimental group),  $n=19$  served as intervention and received a 3 month intensive pelvic floor exercise protocol while

**Group B** (control group) ,  $n=21$  served as control and received no therapy.

### 2.4. Therapy procedure

All women in group A were instructed about pelvic floor anatomy and how to control pelvic muscles voluntarily. Kegel's pelvic floor muscle therapy (PFMT) protocol was used for 3 consecutive months. The exercise comprised of 10 repetitions of 8 contractions each; with contraction held for six seconds and two minutes rest in between each contraction. At the end of each session, three to four fast 'flicker' contractions were added. At 12 weeks, the number of contractions per repetition had been increased to twelve. Women in group A regularly attended physiotherapy clinic for three months (36 sessions) with additional follow up pelvic floor exercises at home daily. Some women who missed their sessions were requested for compliance in future. The effectiveness of biofeedback assisted PFMT was assessed pre and post training in group A and this was statistically compared with group B (at 1st week and after 3 months)

## 3. Results

According to the data in table 1 the average age of participants in the experimental study group is  $38 + -5$  SD and the control group was  $38 + -6$ .SD. As you can see there is no any noticeable difference in the age of patients in both groups .

**Table 1.** Age participants characteristics

|            | Group A (n=19)  | Group B (n=21)  |
|------------|-----------------|-----------------|
| Variables  | Mean $\pm$ SD   | Mean $\pm$ SD   |
| Age(years) | 38.84 $\pm$ 5.5 | 38.67 $\pm$ 6.0 |

After 3 months of treatment we have an noticeable improvement of the IU situation on group A (Tab2). After applying the PFME of this group have decreased the frequency, quantity of urine and number of used protectors,  $p^{**} < 0.001$ .

**Table 2.** Differences between experiments at the beginning and after 12 weeks

| Variables  | Time conducted         |       |                |       | P value |
|--|------------------------|-------|----------------|-------|---------|
|  | Beginning of the study |       | After 12 weeks |       |         |
|  | N                      | %     | N              | %     |         |
| <i>How often do you leak now?</i>                    |                        |       |                |       |         |
| Less than a week                                     | 1                      | 2.6%  | 4              | 10.5% | <0.001  |
| 2 - 3 times a week                                   | 0                      | 0.0%  | 6              | 15.8% |         |
| About once a day                                     | 3                      | 7.9%  | 6              | 15.8% |         |
| Several times per day                                | 5                      | 13.2% | 3              | 7.9%  |         |
| Continually  | 10                     | 26.3% | 0              | 0.0%  |         |
| <i>How much do you usually leak?</i>                 |                        |       |                |       |         |
| A few drips  | 1                      | 2.6%  | 5              | 13.2% | <0.001  |
| Small amount   | 0                      | 0.0%  | 8              | 21.1% |         |
| Average amount                                       | 3                      | 7.9%  | 6              | 15.8% |         |
| Large amount   | 15                     | 39.5% | 0              | 0.0%  |         |
| <i>Number of times toileting during the night</i>    |                        |       |                |       |         |
| 1  | 1                      | 2.6%  | 7              | 18.4% | <0.001  |
| 2  | 0                      | 0.0%  | 11             | 28.9% |         |
| 3  | 5                      | 13.2% | 1              | 2.6%  |         |
| 4  | 9                      | 23.7% | 0              | 0.0%  |         |
| 5  | 4                      | 10.5% | 0              | 0.0%  |         |
| <i>Number of times toileting during a day</i>        |                        |       |                |       |         |
| 1  | 0                      | 0.0%  | 1              | 2.6%  | <0.001  |
| 2  | 1                      | 2.6%  | 8              | 21.1% |         |
| 3  | 0                      | 0.0%  | 10             | 26.3% |         |
| 4  | 6                      | 15.8% | 0              | 0.0%  |         |
| 5  | 12                     | 31.6% | 0              | 0.0%  |         |
| <i>Number of pad or brief changes during the day</i> |                        |       |                |       |         |
| 0  | 1                      | 2.6%  | 4              | 10.5% | <0.001  |
| 1  | 0                      | 0.0%  | 12             | 31.6% |         |
| 2  | 3                      | 7.9%  | 3              | 7.9%  |         |
| 3  | 4                      | 10.5% | 0              | 0.0%  |         |
| 4  | 10                     | 26.3% | 0              | 0.0%  |         |
| 5  | 1                      | 26.3% | 0              | 0.0%  |         |

In group B we don't have any significant improvements of the incontinences situation because the "p" value is not significant in the number of used protectors  $p = 0.267$ ; in the frequency of urination at night = 0.056; and the quantity of urination  $p=0,005$  (tab3) at the beginning of the study and after a period of 3 months.

**Table 3.** Differences between controls at the beginning and after 12 weeks

| Variables  | Time conducted         |       |                |       | P value |
|--|------------------------|-------|----------------|-------|---------|
|  | Beginning of the study |       | After 12 weeks |       |         |
|  | N                      | %     | N              | %     |         |
| <i>How often do you leak now?</i>                    |                        |       |                |       |         |
| Less than a week                                     | 0                      | 0%    | 2              | 4.8%  | 0.001   |
| 2 - 3 times a week                                   | 2                      | 4.8%  | 0              | 0.0%  |         |
| About once a day                                     | 2                      | 4.8%  | 2              | 4.8%  |         |
| Several times per day                                | 5                      | 11.9% | 12             | 28.6% |         |
| Continually  | 12                     | 28.6% | 5              | 11.9% |         |
| <i>How much do you usually leak?</i>                 |                        |       |                |       |         |
| A few drips  | 0                      | 0%    | 1              | 2.4%  | 0.005   |
| Small amount   | 2                      | 4.8%  | 2              | 4.8%  |         |
| Average amount                                       | 8                      | 19%   | 12             | 28.6% |         |
| Large amount   | 11                     | 26.2% | 6              | 14.3% |         |
| <i>Number of times toileting during the night</i>    |                        |       |                |       |         |
| 1  | 1                      | 2.4%  | 2              | 4.8%  | 0.056   |
| 2  | 5                      | 11.9% | 8              | 19%   |         |
| 3  | 12                     | 28.6% | 8              | 19%   |         |
| 4  | 3                      | 7.1%  | 3              | 7.1%  |         |
| <i>Number of times toileting during a day</i>        |                        |       |                |       |         |
| 1  | 0                      | 0.0%  | 2              | 4.8%  | 0.001   |
| 2  | 1                      | 2.4%  | 3              | 7.1%  |         |
| 3  | 4                      | 9.5%  | 8              | 19%   |         |
| 4  | 11                     | 26.2% | 7              | 16.7% |         |
| 5  | 5                      | 11.9% | 1              | 2.4%  |         |
| <i>Number of pad or brief changes during the day</i> |                        |       |                |       |         |
| 1  | 4                      | 9.5%  | 4              | 9.5%  | 0.267   |
| 2  | 8                      | 19%   | 11             | 26.2% |         |
| 3  | 9                      | 21.4% | 6              | 14.3% |         |

With regard to the comparison of two groups at the beginning of the study and 12 weeks after application of pelvic musculatures exercises it was noticed a significant difference in the frequency of urination  $p = 0,00$  after 12 weeks, compared with the  $p = 0.821$  at beginning of the study, and the amount of urination  $p=0,00$  after 12 weeks compared with  $p = 0.262$  at the beginning of the study (Table 4).

There have been no significant difference in the number of used protectors  $p = 0,00$  compeered with the  $p = 0.002$  at the beginning of the study. (Tab.4).

**Table 4.** Differences between controls and experiments at the beginning and after 12 weeks

| Variables  | Control | Experimental | P value |
|--|---------|--------------|---------|
|  | T       | T            |         |
| <i>How often do you leak now?</i>                    |         |              |         |
| Base line  | 0.227   | 0.227        | 0.821   |
| After 12 weeks                                       | 4.254   | 4.272        | 0.000   |
| <i>How much do you usually leak?</i>                 |         |              |         |
| Base line  | -1.134  | -1.128       | 0.264   |
| After 12 weeks                                       | 4.255   | 4.252        | 0.000   |
| <i>Number of times toileting during the night</i>    |         |              |         |
| Base line  | -3.580  | -3.533       | 0.001   |
| After 12 weeks                                       | 3.747   | 3.821        | 0.001   |
| <i>Number of times toileting during a day</i>        |         |              |         |
| Base line  | -2.296  | -2.301       | 0.027   |
| After 12 weeks                                       | 2.265   | 2.322        | 0.027   |
| <i>Number of pad or brief changes during the day</i> |         |              |         |
| Base line  | -3.501  | -3.432       | 0.002   |
| After 12 weeks                                       | 5.459   | 5.493        | 0.000   |

#### 4. Discussion

Urinary incontinence is a common problem for women. Its incidence increases with age and estimates of the prevalence of urinary incontinence in women varies from 10% up to 40%.<sup>2,3</sup> However, these figures do not reflect the true magnitude of the problem, because of under-reporting arising from social embarrassment.

Factors commonly affecting the prevalence of urinary incontinence are: age, gender, race and residing in a nursing home. Life events like pregnancy, child birth and menopause have major implications for urinary incontinence. Other risk factors are obesity (body mass index of over 30), high impact sports (e.g. trampolining, pole vaulting), chronic respiratory disorders causing chronic cough, and intra-abdominal masses causing increase in intra-abdominal pressure. . Pregnancy and vaginal delivery are main risk factors for the development of urinary incontinence. Prevalence of urinary incontinence increases during pregnancy and decreases following delivery, although overall postpartum prevalence still remains higher than before pregnancy. Estimates of the prevalence of SUI during pregnancy and two to three months after delivery varies between 6% and 67%, and 3% to 38% respectively.<sup>4</sup> SUI also increases with parity. In primiparas who deliver vaginally, it has been associated with decrease in pelvic muscle strength by 22–35% between pregnancy and the postpartum period.<sup>5</sup> The prevalence of urinary incontinence has been reported to increase with age. A large epidemiological study of 27,936 Norwegian women suggested a gradual increase in prevalence with age which peaked at around mid life (50 years).<sup>6</sup> Rud et al. and Enhorning et al. found that maximum urethral closure pressures tend to decrease with age. They reported a 2–4% decrease in the functioning of the urethra after the age of 40 years.<sup>7</sup>

In modern medicine, pelvic floor muscle training is the most commonly recommended physical therapy treatment for women with stress leakage of urine. It is also used in the treatment of women with mixed incontinence, and less commonly for urge incontinence. The content of pelvic floor muscle training programs is highly variable. Bok et al stated the theoretical basis for pelvic floor muscle exercise in USI management on the basis of muscular changes; hypertrophy and increase in muscle mass and tone that occur after specific strength training.<sup>8</sup> Miller et al. showed that this simple maneuver could reduce urinary leakage by 98.2% with medium cough, and by 73.3% with a deep cough, after only one week of training.<sup>9</sup> Slack et al. recommended a dedicated pelvic floor physiotherapy service and found a reduction of 33% in the surgical and urodynamic work load following its use.<sup>10</sup> A 10-year follow-up study of women by Cammu et al comprising pelvic exercise for stress incontinence concluded that pelvic floor training is initially successful and there is 66% chance that favorable results will persist for at least 10 years.<sup>11</sup> Adjuncts, such as biofeedback or electrical stimulation are commonly used with pelvic floor muscle training. In randomized trials, about 50% patients with sacral nerve stimulation achieved complete continence while a 50% improvement in main incontinence symptoms was observed in about 87% .<sup>12</sup> Ishiko et al. advised a supplement of intravaginal oestriol along with pelvic floor exercise in postmenopausal women and found that this resulted in a higher cure

rate of incontinence.<sup>13</sup> Women, who do intensive supervised pelvic floor exercises during pregnancy reduce their chances of leakage postpartum during the first year after childbirth. Pregnant women without prior urinary incontinence who were randomized to intensive antenatal PFMT were less likely to report urinary incontinence in later pregnancy or post partum (about 30-56% less).<sup>14</sup>

Our results demonstrate ameliorating the symptoms of urinary incontinences PFME after application.

This brings forth the possibility that although pelvic floor exercises are effective in managing UI yet, longer duration intensive regimes, strict protocol adherence, patient compliance and possible adjuncts like electromyography biofeedback ,magnetic therapy or nerve stimulation may obtain more tangible results in the multiparous female population.

## **5. Conclusions**

The study indicates that physiotherapy has a key role in the conservative treatment of IU and improve the quality of life of people with IU and is less costly than other methods of treatment. The therapeutic effect is Usually Enhanced When The PFMT program is taught and supervised by a specialist Physiotherapist.

This treatment is little known in Albania it is applied only in to private rehabilitation centers. It would be essential and very helpful the introduction of this treatment in all women care centers and hospitals at primary level, secondary and tertiary healthcare in our country.

Further research is necessary to address issues of adherence and the effect of the 'type' of pelvic floor muscle exercise (number and duration of contractions, frequency and duration of sessions, total regime period etc). Health professionals need to find ways to instruct and encourage predisposed women to perform pelvic floor muscles exercises.

## **Acknowledgements**

*Special thanks to all participants in this study for their support and help.*

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