DOI: https://doi.org/10.54393/pbmj.v5i7.653

PAKISTAN BIOMEDICAL JOURNAL
https://www.pakistanbmj.com/journal/index.php/pbmj/index
Volume 5, Issue 7 (July 2022)

Original Article

Comparison of the Effectiveness of Pelvic Floor Muscle Exercises versus Pilates Exercises on Urinary Incontinence in Middle Aged Women". Randomised . Controlled Trial. RCT

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ARTICLE INFO

Key Words:
Urinary incontinence, overweight, postpartum, BMI

How to Cite:
Khurshid , S. ., Fatima Murtaza, S. ., Fatimah, A. ., Uzair Asghar, H. M. ., Maqbool, S. ., Nasreen, A. ., Saeed, S. ., & Mushtaq , Q. . (2022). Comparison of the Effectiveness of Pelvic Floor Muscle Exercises versus Pilates Exercises on Urinary Incontinence in Middle Aged Women". Randomized Controlled Trial. RCT: Effectiveness of Pelvic Floor Muscle Exercises and Pilates for Urinary Incontinence. Pakistan BioMedical Journal, 5(7). https://doi.org/10.54393/pbmj.v5i7.653

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Received Date: 16th July, 2022
Acceptance Date: 24th July, 2022
Published Date: 31st July, 2022

ABSTRACT

Often impacting elderly women, the urinary incontinence is defined as the involuntary urine loss. **Objective:** The purpose of this study was to see the comparative effectiveness of pelvic floor muscle exercise with pilates training for treatment of urinary incontinence. **Methods:** The study's 36 patients who met the eligibility requirements were accepted. Prior to conducting any examinations, we obtained written informed consents from each participant. Patients with urinary incontinence were divided randomly into two groups. In 'group A' pelvic floor muscle exercises were applied while in 'group B' pilates training was applied. Allocation of patients in two groups was done by computerised generated list. Both groups received conventional therapy, which was the same throughout the study. The conventional therapy includes adductor strengthening of thigh and hot pack for 15 minutes. Group A received conventional therapy and pelvic floor muscle exercise while group B received conventional therapy and pilates training. Treatment frequency was 2 times a week. The duration of treatment was 6 weeks in both groups. Each patient's informed consent was obtained before the questionnaire was filled out. Scores were derived using the Questionnaire for Female Urinary Incontinence Diagnosis (QUID) and the International Consultation on Incontinence Questionnaire (ICIQ). **Results:** Patients in group A significantly outperformed those in group B. **Conclusion:** According to the study's findings, strengthening the pelvic floor muscles is superior than practicing pilates for treating stress urine incontinence. Pelvic floor exercises not only improved the urine leakage problem but also strengthened the muscle of abdomen and pelvis. So these exercises programs should be included in treatment plans along with medications in public health care for the welfare of patients.

INTRODUCTION

Adults and the elderly, particularly women, frequently struggle with urinary incontinence. Involuntary urine loss is known as urinary incontinence, and it lowers a person's quality of life [1]. The pelvic floor muscles' weakened state is the cause of urinary incontinence. The PFM are skeletal muscles that make up the pelvic and urogenital region. They are made up of a number of muscles and muscle layers [2]. In this condition, involuntary loss of urine occurs and there are more than 3 to 4 episodes of urine leakage per day. It is diagnosed through history, careful physical

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examination and by certain tests and investigations such as ultrasound and cystoscopy [3]. Stress urinary incontinence is the most prevalent type of urine incontinence in women. In this type, urinary leakage occurs due to physical exertion and stress activities like laughing, coughing, and sneezing. It is due to the damage to urethral support which is supported by pelvic muscles. Control over urinary sphincter is lost or may be weakened [4]. These symptoms tend to become worse with the increasing age specially in postmenopausal women. Due to increased intra-abdominal pressure brought on by insufficient urethral closure pressure, stress urine leakage develops. Due to anatomical alterations in the bladder, urethra, and muscles, such as weak pelvic floor muscles, there is insufficient urethral closure pressure, which leads to urine incontinence [5]. The occurrence of urinary incontinence in women can have very distressing psychological effects. Although urinary incontinence is not a dangerous condition, it may cause emotional disorders due to constant wetness and irritation [6]. Not only, it is uncomfortable and intimidating to a women's self-confidence but it may also result in depression and social isolation, affecting quality of life [7]. If a woman is able to utilise treatment strategies, it is premised that she will not be depressed and socially isolated while in the meantime, her quality of life will be improved [8]. In general, specific symptoms or findings, the kind of UI, the frequency of urine leakage, the intensity of the leakage or symptoms, and the degree of difficulties for the women are all characteristics of urinary incontinence. The forms and symptoms of urine incontinence can have a significant impact on estimations of prevalence and incidence. There are currently no epidemiologic definitions for UI or SUI that are standardised or uniform [9]. Women suffering from such incontinence disorders need to strengthen their pelvic floor muscles so they are advised to perform kegal exercises for strengthening and coordination of their pelvic floor and abdominal muscles [10]. The pelvic floor is a set of muscles that maintains and stabilizes the pelvic organs, such as the bladder and bowel. These muscles help in urinary control and continence. When these muscles are weakened then urinary incontinence occurs [11]. The exercises are reported to be 50% to 69% effective in reducing urinary leakage problems and strengthening pelvic floor muscles [12]. For improving the urinary incontinence, pelvic floor muscle exercises are used which help to strengthen pelvic floor muscle and prevents unwanted leakage of urine [13]. In pelvic floor muscle exercises, women learn to perform well controlled, single pelvic floor muscle contraction just at the moment of uncontrolled leakage to develop high urethral pressure and to reduce urinary loss [14]. The exercises that focus on strengthening the abdominals, lower back, and thigh muscles are taught by the pilates teacher using verbal cues. These exercises are created based on the patient's body weight and level of endurance. Pilates practitioners think their techniques can significantly increase pelvic floor strength, and that these changes are very likely to last over time [15]. If so, the pilates techniques may offer newer, more effective ways of treating and preventing pelvic floor disorders. Pilates exercises are becoming more popular, but little is known about how they specifically affect the female pelvic floor muscle [15, 16]. Breathing exercises and pelvic floor muscle contractions are part of contemporary pilates exercise routines. Pelvic floor muscles are inadvertently trained through exercise and movement, rather than being specifically practised [17]. Inadvertent co-contraction of the pelvic floor muscles during pilates movements would counterbalance increases in intra-abdominal pressure that happen during exercise, avoiding leakage and bolstering the pelvic floor muscles. Pilates training involves breathing and muscle contractions all throughout the therapy session in this way. The usefulness of pilates training in enhancing bladder functioning needs more research [18].

METHODS

This research study was conducted according to the inclusion and exclusion criteria for the treatment of stress urinary incontinence. Consent was taken through the consent form before starting the treatment of patients. The examination includes data which have a subjective and objective examination. The data consist of demographic information, including age, gender, socioeconomic status, duration of onset nature, and location of symptoms. All those patients who were not willing to participate were excluded from study and those who left treatment session in the middle of research were also excluded. As previously discussed, there are two groups group A and B who were receiving treatment. Both groups are experimental groups. Group A (Experimental Group); This group first received adductor strengthening conventional treatment for 10 minutes and then pelvic floor muscle exercises. These pelvic floor exercises include kegal exercise, squats, bridging, and squeeze and release exercises. All patients of group A repeated single exercises for 10 times and all 4 exercises for 40 times in total. The second group, group B (Experimental Group); first received adductor strengthening conventional treatment for 10 minutes and then pilates training exercises. These include pilates curl, single leg stretch, double leg stretch and roll up exercises. All patients of this group repeated single exercises for 10 times and all 4 exercises for 40 times in total.

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RESULTS

Table 1 shows the demographics of the participants involved. Total 36 patients were included in this study, 18 in group A and 18 in group B, respectively. The gender demographics depict that there were 12 males, 6 females in group A and 6 males, 12 females in group B, respectively. The mean values of age, occupational, marital status were 40.61±11.08, 1.06±0.23, and 0.83±0.38 in group A while 40.22±14.65, 1.06±0.23, and 0.89±0.32 in group B.

Descriptive statistics	Group A (n=18)	Group B (n=18)
Gender	12/6	6/12
Age	40.61±11.08	40.22 ±14.65
Occupational Status	1.06± 0.23	1.06 ±0.23
Marital Status	0.83 ±0.38	0.89 ±0.32

Table 1: Descriptive statistical analysis (N=36) between groups

Table 2 depicts the pre- and post- treatment comparison of pelvic floor disability index scale in group A had shown that mean score was 2.822±0.881 which improved to 0.496±0.534 after treatment with the significant value of 0.000 which is less than 0.05 showing that pelvic floor muscle exercises are effective in reducing the urinary in continence and strengthening of pelvic floor muscles. While group B had shown that mean score was 2.855±0.793 before treatment, 2.398±0.673 after treatment with the significant value of 0.001 which is less than 0.05 showing that pilates exercises are effective in reducing the urinary in continence and strengthening of pelvic floor muscles. We can say that pelvic floor muscle exercises of group A were effective in reduction of urinary incontinence as the mean value was improved a lot as compared to other groups and the level of significance was less than 0.005.

		Group A (n=18)	Group B (n=18)
PFDI Score	Pre-value	2.82+0.88	2.855+0.793
	Post-value	0.496+0.53	2.398+0.673
	P-value	0.000	0.000

Table 2: Pre and post treatment scores of Group A & B

DISCUSSION

The present examination was done to check the efficacy of pelvic floor muscle exercises and pilates exercises for the treatment of stress urinary incontinence in women. We have applied two treatment techniques among 36 patients with equal divisions. Group A had received pelvic floor muscle exercises and group B received pilates training. Similarly, 18 patients were allocated to each group. Our aim was comparing the results of pelvic floor muscle exercises and pilates exercises to determine which treatment technique was better. For this purpose, we had used pelvic floor disability index questionnaire scale. Proper consent was taken from each patient. This study program consisted of 2 sessions per week and in total there were 32 sessions. Follow up was also taken after 6 weeks to check improvements in results. After four to six weeks, we noticed that there was quite alleviation of urinary incontinence in both groups. Ten middle-aged women with little to no pelvic floor dysfunction participated in a study where they underwent 24 one-hour sessions of Pilates exercises over the course of 12 weeks. The findings suggested that the pilates method increased the contractility and pressure of the PFM in these women and decreased urinary incontinence [19]. In another study, women who completed either a structured pilates exercise or a "conventional" pelvic muscle-training programme were compared for their effectiveness in strengthening their pelvic muscles [20]. The major improvement that we observed was at approximately after 40 days. The patients that received pelvic floor exercises felt a large improvement in uncontrolled and unwanted urine frequency one month follow up as compared with participants that were allocated to the pilates training group. This study calculated results of treatment effects. A great difference was found between the pelvic floor muscle exercises treatment group and pilates training treatment group. Those women who received pelvic floor treatment were confident and showed improvement in urinary incontinence problem after 6 weeks. And those who received pilates treatment were not that happy about the results as these exercises not proved much effective as compared to other group. Moreover, some old females found it difficult to perform this training [21]. Although we did not meet our desired of large sample size, this was a relatively small study. This theory was also supported by other researches that pelvic floor exercises are helpful for treating urinary incontinence and more randomised trials are needed to conclude Before we could suggest the wider application of this technique for that goal, we needed to determine whether a Pilates programme may genuinely improve urinary incontinence [22].

CONCLUSION

Pelvic floor muscles exercises are more effective in reducing the urinary incontinence and strengthening of pelvic floor muscles as compared to pilates exercises. Exercises for the pelvic floor muscles are very useful at preventing incontinence and enhancing their power. These techniques are non-invasive, efficient, and call for fewer trips to the hospital or clinic for a suitable early response. Further research on a larger scale is recommended to prove the effectiveness of other treatment plans in for the stress urinary incontinence in females.

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